PROCESSING OF SAMPLES FROM CATCHES OF TUNA IN THE ATLANTIC OCEAN

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La Jolla, California 92038

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Table of Contents

Processing of samples from catches of U.S. tuna seiners in the Atlantic Ocean

INTRODUCTION

Sampling of U.S. tuna seiners fishing in the Atlantic Ocean was started in 1967 by NMFS, La Jolla, under a contract with the Inter-American Tropical Tuna Commission (IATTC). The IATTC, under this contract, collects three types of data; 1) length-frequency samples, 2) catch and effort data, and 3) landing data. Length-frequency samples are taken for as many of the species in the catches as possible, although, yellowfin and skipjack tuna samples are given top priority. As many as 12 samples for yellowfin tuna and 6 samples for skipjack tuna are taken per area-time strata. Catch and effort data are extracted from vessel logbooks by the IATTC and standardized catches and efforts are made available by 1-degree square and month. Landing data are extracted from boat cards and made available on a standard form. The steps used to process these data sets into the report to the International Commission for the Conservation of Atlantic Tunas (ICCAT) are presented in the following sections.

LENGTH FREQUENCY

Samples of length frequency from the catch of U.S. tuna seiners fishing in the Atlantic are taken as these vessels return to Puerto Rico. These samples are then forwarded through the IATTC in La Jolla to NMFS where the data goes through the following steps:

1) Two loose-leaf binders are made at the beginning of the year and labeled one for originals and one for duplicates. Sections are made for each species; yellowfin, skipjack, bigeye, albacore and others. Log-in forms, Appendix I are made for each species and kept in the front of all samples for that species.

2) Xerox copies of each sample are made as soon as they are received. Originals are stored in the originals binder and duplicates in the duplicates binder. The duplicates binder is the working copy and all work should be done on these not the originals.

3) Samples are logged in by filling out the information on the log-in forms.

   A) SPL # = sample number

   B) DATE MEAS. = date measured, month/day

   C) CATCHER VESSEL = name of catcher vessel

D) GEAR = baitboat - BB, purse seine - PS, longline - LL, etc.

E) FLAG = country of vessel making the catch.

F) REPORTED TONNAGE = tonnage listed on back of length frequency sample.

G) ADJUSTED TONNAGE = tonnage from logbook information

H) Mo. = month of catch

I) AREA = area of catch

J) HATCH/WELL = number of hatch or well where the sample was taken.

K) TRANSSHIPMENT VESSEL = name of the transshipment vessel

L) # SAMPLED = number of fish measured

M) AM. = American
FOR.= Foreign } check one that specifies the flag of the catch

N) COMP. = enter species composition sample number used

O) USED = check here if this sample is used in computing the total length-frequency for the year

P) COMMENTS = enter any comments

4) Punch samples (Appendix III)

5) Hand-check and file in card cabinet

CATCH AND EFFORT

Catch and effort information is supplied by the IATTC from vessel logbooks. All information is in summary form, by month and 1-degree square, and contains catches of yellowfin and skipjack only. Catches of other species are added when obtained from the IATTC. Processing of these data is accomplished by compiling the seven programs described in Appendix XI. Reports generated from these programs are included in the ICCAT report, Appendix XII.

REPORTS

Samples must be kept up-to-date (punched and logged in) so that quarterly reports and ICCAT reports can be made with a minimum amount of delay (Appendix VII). Quarterly reports should include;

1) Number of vessels fishing

2) Total catches to date

3) Number of samples by species, area and time

4) Tonnage sampled by species, area and time

Reports to ICCAT are made bi-annually and should include:

1) Catch and effort reports

2) Length-frequency reports by area-time strata

3) Table of total catches and number of boats

Programs used to calculate these outputs and a sample of the final report is contained in Appendices IX, XI, and XII respectively.

Processing of samples from transshipments to Puerto Rico from vessels fishing in the Atlantic Ocean

INTRODUCTION

Sampling of transshipped Atlantic tunas was initiated by NMFS, La Jolla in March 1974. A biological technician stationed in Puerto Rico collects 1) species-composition samples, 2) length-frequency samples, 3) biological samples and 4) special samples from catcher vessels who transship their catches to Mayaguez and Ponce for canning. (Details of the sampling program are contained in Appendix A.) Landings are mainly from Japan, Korea, Ghana, Spain, and France and contain yellowfin, bigeye, and skipjack tunas from purse seiners and baitboats and albacore from longliners. Most purse seine and baitboat catches of tropical tunas are made within a 200-mile radius of Tema, Ghana. Longline catches of albacore tuna are made throughout the Atlantic Ocean. This report describes the procedures used to log-in and process samples from transshipped catches.

LENGTH FREQUENCY AND SPECIES COMPOSITION SAMPLES

Samples of length-frequency by catcher vessel and species and samples of species composition mainly for yellowfin and bigeye catches are received continuously throughout the year by a mathematics technician at the NMFS La Jolla Laboratory. These samples are processed through the following steps:

1) Two loose-leaf binders are made at the beginning of the year and labeled one for originals and one for duplicates. Sections are made for each species, yellowfin, skipjack, bigeye, albacore, and others. Log-in forms Appendix I are made for each species and are kept in the front of all samples for that species.

2) Xerox copies of each sample are made as soon as they are received. Original copies are then stored in the originals binder and Xerox copies are stored in the duplicates binder by species. The duplicates binder serves as the working copy and all work should be done on these copies--not on the originals.

3) Samples are logged in by filling in all information on the log-in forms.

   A) SRL # = sample number

   B) DATE MEAS. = date measured, Month/day

   C) CATCHER VESSEL = enter the name of the catcher vessel

   D) GEAR = baitboat = BB, purse seine = PS, longline = LL, etc.

E) FLAG = country of vessel making the catch

F) REPORTED TONNAGE
G) ADJUSTED TONNAGE } refer to steps 4-6

H) Mo. = month of catch

I) AREA = area of catch

J) HATCH/WELL = enter the number of the hatch or well from which the sample was taken

K) TRANSSHIPMENT VESSEL = enter the name of the transshipment vessel

L) # SAMPLED

M) AM. = American
FOR = Foreign } check one that specifies the flat country making the catch

N) COMP. # = enter species composition number used

O) USED = check here if this sample is used in computing the total length frequency for the year or quarter

P) COMMENTS = enter any comments

4) Determine the actual tonnage being sampled from the back of the length-frequency sample under size code.

A) Yellowfin reported tonnage is determined by adding those tonnages listed under size breakdown for both yellowfin and bigeye of the correct size code. All fish are either considered to be of sizes 1 and 2 or 3 when randomly sampled. Tonnages for size code 3 fish, when the fish condition is G&G, must be raised by the factor 1.15 and only those tonnages under G&G are to be used.

B) The total unloading weight for skipjack will be used in computing sampling tonnage. Incidental skipjack tonnage broken out from yellowfin sample tonnages through the SPECIES COMPOSITION program must be added to any corresponding skipjack sample. For those samples shipped from Abidjan the cargo plan weight and manifest weight are often not in agreement. In this case the cargo plan weight from catcher vessel tonnages should be taken as a percentage of the manifest weight and multiplied by the actual unloading weight to determine tonnage being sampled.

C) Bigeye sampling tonnages are taken from the species composition breakdown of the corresponding yellowfin sample.

D) Albacore and other species have their tonnages taken directly from the unloading weights listed under size breakdown.

5) Using the species composition sample for the length-frequency sample under consideration, break the tonnage in Step 4 into the corresponding species (use program SPECIES COMPOSITION, Appendix II). Record these tonnages on the log-in forms for each species under REPORTED TONNAGE.

6) Multiply reported tonnages in short tons by 0.907185 and enter this value under ADJUSTED TONNAGE.

7) Punch samples (Appendix III).

8) Hand-check and file in card cabinet.

9) Summary information

A) The reported tonnages from the program SPECIES COMPOSITION are used for this calculation

B) Table of number of fish sampled and tonnage (metric tons) sampled by quarter country and gear (Appendix V).

C) Sample distribution by month was determined by estimating the date of capture. For baitboats (according to the transshipment date), everything on or before the 15th of each month was placed in the previous month. The month of capture for longline, purse seine, and cold stores was taken directly as the month of transshipment.

BIOLOGICAL SAMPLES

Biological samples (refer to Appendix A) are taken to positively identify hard-to-separate species (e.g., yellowfin and bigeye) and to collect other information (e.g., length, weight, sex, parasite ID). The following steps should be taken:

1) Two loose-leaf binders are made at the beginning of the year, one for originals and one for duplicates.

2) Xerox copies are made of all samples as they are received and placed in the appropriate binder.

3) Record samples on log-in forms (Appendix I), filling in the following:

   A) SPL # - sample number

   B) DATE MEAS. - date measured, month/day

   C) CATCHER VESSEL - enter the name of the catcher vessel

   D) GEAR - gear used to catch sample fish

   E) FLAG - nation operating catcher vessel

   F) MO. - month of capture

   G) AREA - area of capture

   H) HATCH/WELL - number of the hatch or well

   I) TRANSSHIPMENT VESSEL

   J) # SAMPLED - number of fish sampled

   K) CLASSIF. - check American or foreign

   L) COMMENTS - any relevant comments

4) Update summary sheet for biological samples (Appendix VI) indicating by quarter, species and 5-cm interval, the number of fish identified by external characters, the number mis-identified and the species mis-identified.

REPORTS

Samples of length-frequency and species composition must be kept current (loged-in, punched and checked) so that quarterly reports can be made with the least amount of delay (refer to table of deadlines, Appendix VII). The following information is needed:

1) Table of the number of fish measured and tonnage (metric tons) sampled by species and quarter sampled.

2) Length frequency by species and quarter and a summary length frequency by species for the year. (Refer to program LENFRE, Appendix IX).

This information along with a brief write-up will be included in the Center monthly report.

Reports to ICCAT (International Commission for the Conservation of Atlantic Tunas) are processed bi-yearly (refer to deadlines, Appendix VII and flow chart, Appendix VIII). A sample report is presented in Appendix X. Variations of this report are compiled to accommodate the kind of data on hand.

SPECIES:_____

YEAR:_____

SOURCE:_____

LENGTH FREQUENCY AND COMPOSITION
SAMPLE LOG

PG._____OF_____

SPL #	DATE MEAS.	CATCHER VESSEL	GEAR	FLAG	REPORTED TONNAGE	ADJUSTED TONNAGE	MO.	AREA	HATCH/ WELL	TRANSSHIPMENT VESSEL	# SAMP-LED	CLASSIF.		COMP. #	USED	COMMENTS
												AM.	FOR.			

Appendix 1

Appendix II

Program: SPECIES COMPOSITION

Programmer: Al Coan

System: Hewlett-Packard 9810A Steps: 426

Date: December 7, 1976

Purpose: The program is used to convert the reported tonnage of a multi-species catch into catch by species using a species composition sample. The data used are from the NMFS Puerto Rico sampling program of foreign landings and consists of length-frequency samples by species and species composition samples. (Note! Length-frequency samples must be $\geq$ 3 fish)

Inputs[1/]: 1) A) Enter Program Card

B) Key in - RUN, END, CLEAR, CONTINUE, FIX( ), 2

2) Enter - 0, CONTINUE - if you have a yellowfin length frequency and proceed to step 3.

- 1, CONTINUE - if not and proceed to step 5.

3) Enter length in centimeters, CONTINUE

4) Enter number of fish of length in step 3, CONTINUE
Repeat steps 3-4 till all of length frequency used then key in SET FLAG, CONTINUE

5) Enter - 0, CONTINUE - if you have a skipjack length-frequency sample and proceed to step 6.

- 1, CONTINUE - if not and proceed to step 8.

6) Enter length in centimeters, CONTINUE

7) Enter number of fish of length in step 6, CONTINUE
Repeat steps 6-7 till all of length frequency used then key in SET FLAG, CONTINUE

8) Enter - 0, CONTINUE - if you have a bigeye length frequency and proceed to step 9

-1, CONTINUE - if not and proceed to step 11

9) Enter length in centimeters, CONTINUE

1/

10) Enter number of fish at length in step 9, CONTINUE
Repeat steps 9-10 till all of length frequency is used then key in SET FLAG, CONTINUE

11) Enter - 0, CONTINUE - if you have length frequencies of species other than yellowfin, skipjack or bigeye and proceed to step 12

- 1, CONTINUE - if not and proceed to step 17

12) Enter α of the length-weight relation ($w = \alpha L^{\beta}$ for the species you are considering, CONTINUE.

13) Enter β of the length-weight relation for the species you are considering, CONTINUE

14) Enter length in centimeters, CONTINUE

15) Enter number of fish at length in step 14, CONTINUE
Repeat steps 14-15 till all of length frequency used then key in SET FLAG, CONTINUE

16) Enter - 1, CONTINUE - if you have another length frequency other than yellowfin, skipjack or bigeye and go back to step 12.

- 0, CONTINUE - if not and proceed to step 17.

17) Enter tonnage (short tons) to be separated by species, CONTINUE

{Start at step 2 for next problem}

Outputs: For each problem the percentage of each species by weight and the estimated tonnage (short tons) by species is output as follows:

[Note: A similar program exists on the HP-65 if this machine is not available. Refer to Appendix]

U.S. LENGTH-FREQUENCY FORMAT

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Columns	Description
CARD 1	
1-10	Total tonnage (short tons) from which sample was taken.
11-20	Disregard
21-24	Year
25-35	Species
36-39	Time strata (m=01,m=02, etc.)
40	Blank
41-50	ICCAT area of catch
51-59	Blank
60	Set type code 1= school fish (unspecified type) 2= porpoise 3= night set 4= floating object 5= unknown 6= breezers, boilers, foamers black spot, green spot 7= Jumpers, shiners, feeding school 8= finners 9= combination of 1 and 4
61	1= sample from single set
62-63	gear of catcher vessel PS= purse seine
64-80	Blank
CARD 2	
1-4	Starting interval (cm)
5-10	Interval length
11-13	1= one-degree information available 0= no information

in the original document this page was intentionally made to exceed the margins of the rest of the document in order to be easily found

Columns	Description
CARD 2 cont.	
14-19	One-degree square (ICCAT quadrant, latitude, longitude
20-75	other one-degree squares
CARD 3	
1-80	length frequency one value in each 4 columns

(NOTE CARD 3 IS REPEATED UNTIL THE TOTAL FREQUENCY IS ENTERED)

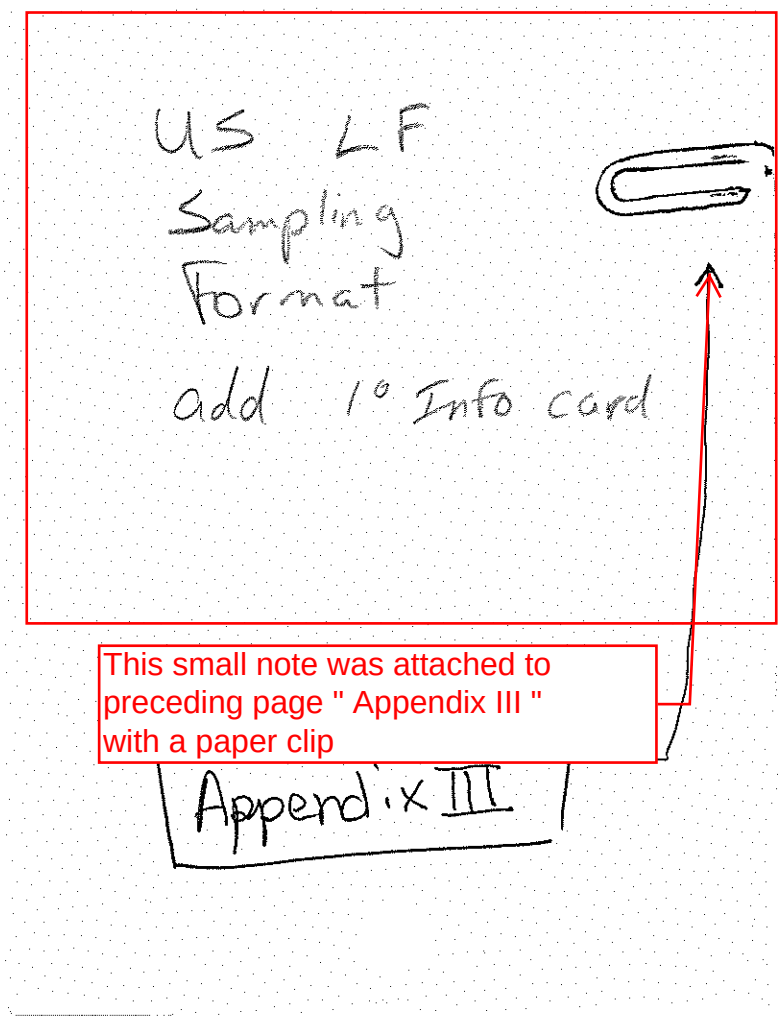
CARD 4	
1-3	'999' denotes end of sample

see attached note next page

Appendix III

Coding format for U.S. and foreign-caught length-frequency samples collected by NMFS, La Jolla

Columns	Type of entry	Description
Card 1		
1-10	Numeric (right justify)	Adjusted tonnage (short tons) for the species being coded. Record tonnage to 2 decimal places. (Format F10.0)
11-20	Numeric (right justify)	Effort in days fishing. If unavailable enter 1.00. (Format 10.0).
21-24	Numeric	Enter year in which the fish were caught.
25-35	Alphanumeric (left justify)	Enter the common name of the species sampled.
36-39	Alphanumeric (left justify)	Enter the time strata in which the fish were caught. CODE Q=01 quarter 1 (January-March) Q=02 quarter 2 (April-June) Q=03 quarter 3 (July-September) Q=04 quarter 4 (October-December) or if the month is known M=01, 02...12
40	Blank	
41-50	Alphanumeric	Area of catch. Use ICCAT areas and enter the digits for each area, e.g., 03, 72, 15. (at most 5 areas)
51-59	Alphanumeric	Sample number. Enter three digits for each sample, e.g., 001, 002, etc. (at most 3 samples)
60	Numeric	Code for set type if set data is available (Format I1). 1. School fish 6. Breezers Boilers Foamers Black spot Green spot


US LF
Sampling
Format
add 1° Info card
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Appendix III

7. Jumpers
   Shiners
   Feeding school
8. Finners

2. Porpoise
3. Night set
4. Floating object
   Whale
   Log
   Shark
   Kelp
5. Unknown or IATTC G's (Guess)
9. Combination of 1 and 4

61	Alphanumeric	If the sample is from a single set enter 1.
62-63	Alphanumeric	Enter type of gear used by catcher vessel. BB = baitboat PS = purse seiner CS = coldstores LL = longline
64	Blank	
65-80	Alphanumeric	Enter the name of the catcher vessel.

Card 2

1-80	Numeric	Enter length-frequency one value in every four columns (punch decimal point). Note: all frequencies that are for one species and year must start at the same initial starting length.

(Repeat card 2 until all values are entered. The maximum number of entries is 200 per sample)

Card n

1-3	Numeric	Enter '999' to denote the end of the sample.

Appendix IV

PERCENT OF BIGEYE IN YELLOWFIN TONNAGES AND PERCENT OF YELLOWFIN IN BIGEYE TONNAGES

YEAR: _____

SAMPLE #	BE	YF		SAMPLE #	BE	YF				
1				49						
2				50						
3				51						
4				52						
5				53						
6				54						
7				55						
8				56						
9				57						
10				58						
11				59						
12				60						
13				61						
14				62						
15				63						
16				64						
17				65						
18				66						
19				67						
20				68						
21				69						
22				70						
23				71						
24				72						
25				73						
26				74						
27				75						
28				76						
29				77						
30				78						
31				79						
32				80						
33				81						
34				82						
35				83						
36				84						
37				85						
38				86						
39				87						
40				88						
41				89						
42				90						
43										
44				BE =	% of BE	in YF sample				
45				YF =	% of YF	in BE sample				
46										
47										
48										

FOREIGN LANDINGS (METRIC TONS) AND NUMBER OF FISH SAMPLED FOR LENGTH-FREQUENCY IN PUERTO RICO, U.S.A., BY THE SOUTHWEST FISHERIES CENTER

YEAR: _____ AREA: _____ PAGE ___ OF ___

PERIOD: _____

GEAR	COUNTRY	ALBACORE		BIGEYE		BLUEFIN		SKIPJACK		YELLOWFIN	
		TONNAGE	#FISH	TONNAGE	#FISH	TONNAGE	#FISH	TONNAGE	#FISH	TONNAGE	#FISH
BAITBOAT	FRANCE GHANA JAPAN KOREA PANAMA SPAIN MIXED										
	TOTAL										
PURSE SEINE	FRANCE GHANA JAPAN KOREA PANAMA SPAIN										
SURFACE	MIXED										
	TOTAL										
LONGLINE	JAPAN KOREA MIXED										
	TOTAL										
GRAND TOTAL											

APPENDIX VI

SUMMARY SHEET
FOR BIOLOGICAL SAMPLES

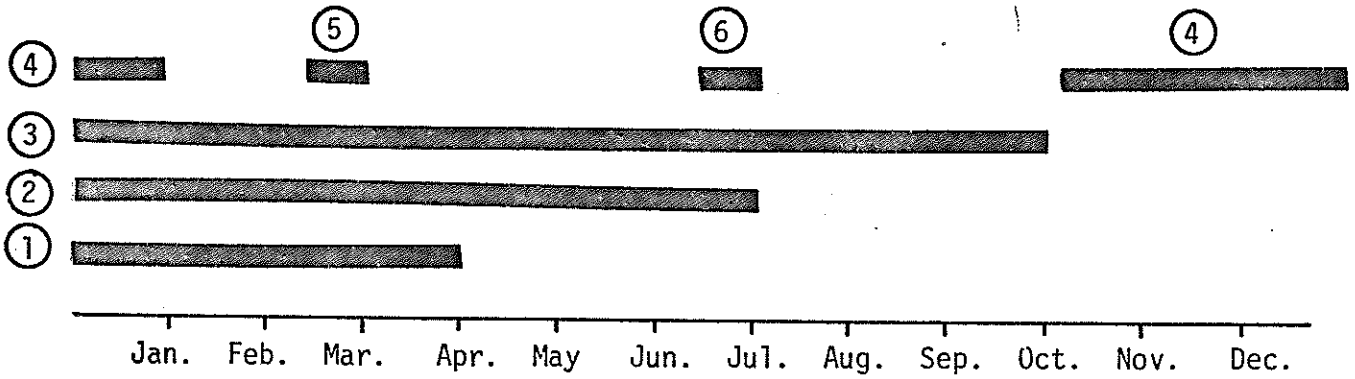
YEAR: _____
QUARTER: _____

SPECIES:															
(cm.) Interval	E	M	*	T	E	M	*	T	E	M	*	T	E	M	*	T
26- 30																
31- 35																
36- 40																
41- 45																
46- 50																
51- 55																
56- 60																
61- 65																
66- 70																
71- 75																
76- 80																
81- 85																
86- 90																
91- 95																
96-100																
101-105																
106-110																
111-115																
116-120																
121-125																
126-130																
131-135																
136-140																
141-145																
146-150																
151-155																
156-160																
161-165																
166-170																
171-175																
176-180																
181-185																
186-190																
191-195																
196-200																
Total																

E = # of External ID
M = # of Mistaken ID
* = # of samples with weights
T = True ID of M

Appendix VII

DEADLINES



1 Quarter 1 report for current year
- A) length-frequency by species
- B) sampling coverage by species

2 Quarter 2 report (contains quarters 1-2) for current year
- A) length frequency by species
- B) sampling coverage by species
- C) other experiments

3 Quarter 3 report (contains quarters 1-3) for current year
- A) length frequencies by species
- B) sampling coverage by species
- C) other experiments

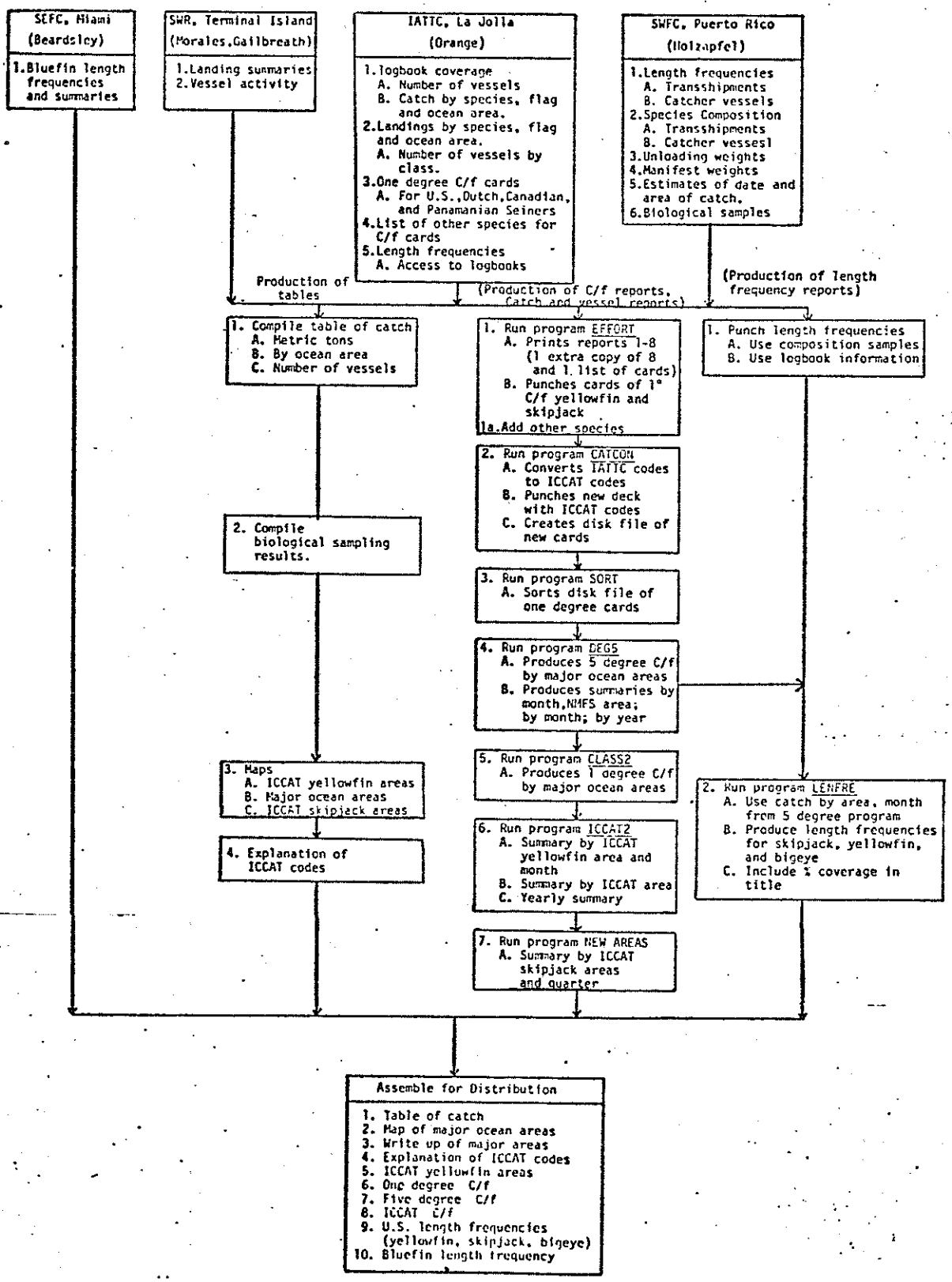
4 Quarter 4 report (contains quarters 1-4) for past year
- A) length frequencies by species
- B) sampling coverage by species
- C) other experiments

5 Preliminary report to ICCAT (Feb. 15-Mar. 1) for past year
- A) length frequency by species
- B) sampling coverage by species
- C) reports on other experiments

6 Final report to ICCAT (June 15-July 1) for past year
- A) length frequency by species
- B) sampling coverage by species
- C) reports on other experiments

Appendix VIII

Flow Diagram for Producing ICCAT Package



Appendix IX

LENGTH-FREQUENCY ANALYSIS (LENFRE)

Identification

LENFRE - Length-frequency analysis

Original programmers - Nancy Wiley, Dr. William Lenarz

Revisions and documentation - Atilio L. Coan, Jr.

Language - Fortran December 27, 1976

NMFS, NOAA
Southwest Fisheries Center
8604 La Jolla Shores Drive
La Jolla, California 92038

Purpose

The program is used to estimate, from sample length-frequencies, the length composition in number and in weight of the total catch in each time-area stratum. Also calculated for each time-area stratum are average ages, average lengths, average weights, total number, total weights, effort, and catch per unit of effort.

Methods

The total weight in each stratum is converted into total numbers by finding the average weight in each stratum. The length-weight relation,

$$W=\alpha L^{\beta}$$

where W is weight in kilograms, L is length in centimeters and α and β are constants which vary with each species of fish, is used to convert length frequencies to weight frequencies. The average weight is calculated by

$$\overline{W} = \frac{\sum_{i=1}^{n} W_i \times N_i}{N_t}$$

where N_t is the total number in the sample and N_i is the number at each weight interval W_i.

The total number in the stratum is then calculated by dividing the average weight into the total catch for the stratum. This total number is then redistributed over the sample length frequency to calculate the total length distribution of the catch.

Average ages are calculated using the von Bertalanffy growth equation

$$L_t = L\infty \left[1-e^{-k\,(t-t_o)} \right]$$

where L_t is the length in centimeters at time t in years, $L\infty$ is the asymtotic length in centimeters, k is the annual growth rate, and t_o is the thearetical age in years when $L_t = 0$.

Catch per unit effort is calculated, by dividing total catch by total effort, in stratum where both the total catch and total effort are known.

Options

The program has four output options and four stratification options

A. Output

IOPT=0 or blank, produces the standard output (Tables 1-6).

IOPT=1, produces Tables 1-4 only

IEFOP=1, leaves effort out of all printing and is used when estimates of effort are not available.

IPOP=1, punches Table 2 length frequencies by stratum one in every 10 columns of a card. No header cards are punched and a '999' card ends each frequency.

B. Stratification

NOPT=0 or blank, produces no stratification and assumes

stratification has been done by the user or that each sample is a separate stratum.

NOPT=1, uses the first stratification method. All samples are standardized to fifty fish samples then combined into one sample for its corresponding area-time stratum. This method weights each sample equally and tends to under estimate the total number of fish especially for smaller fish.

NOPT=2, uses the second stratification method. All samples are weighted by the total tonnage of the sample and then combined into one sample for the appropriate area-time stratum. This method is the best when total tonnage sampled is available.

NOPT=3, uses the last stratification method. The method assumes NOPT=0 to obtain a total length distribution for the year. It then uses this distribution along with the total tonnage for the year to estimate the actual length distribution. This option is the poorest and should be used only if no idea of the area-time distribution is known.

Input

Card	Column	Description
1	1-18	Date of compilation
	19-20	Label
2	1-10	α of length-weight relation
	11-20	β of length-weight relation
	21-30	t_o of von Bertalanffy growth equation
	31-40	K of von Bertalanffy growth equation
	41-50	L_∞ of von Bertalanffy growth equation
	51-60	Initial length of all samples
	61-70	Length increment of all samples
	77	Punch option (IPOP)
	78	Effort option (IEFOP)
	79	Output length option (IOPT)
	80	Stratitifaction option (NOPT)

Card	Column	Description
3	1-10	Weight in metric tons for this stratum. Short tons if NOPT=3.
	11-20	Effort in days fishing (enter 1.00 if unknown and IEFOP must equal 1) for this area-time stratum.
	21-40	Year and species sampled.
	41-80	Label (e.g., name of stratum and time)

----------use this section for NOPT=1 or 2 ----------

[if the length-frequency from the preceeding stratum is to be used for this stramtum enter 9999. in columns 1-5 and go to card 3 for a new stratum.]

4	1-10	Weight in short tons for each sample. This weight must be known for NOPT=2 but for NOPT=1 enter 1.00 if unknown.
	11-20	Effort in days fishing enter 1.00 if unknown.
	21-40	Year and species sampled
	41-80	Label (e.g., month, area, vessel name)

5	1-4	Number of fish in length i
	5-8	Number of fish in length i + 1
	.	.
	(all data is read in format F4.1)	
	77-80	Number of fish in length i +19

[Repeat card 5 until all of the sample is recorded]

6	1-3	'999' card signifies the end of the sample

[For NOPT=1 or 2 repeat cards 4-6 until all samples for the area-time strata are used]

Card	Column	Description
7	Blank card	Signifies the end of strata. Do not use this card if NOPT=0 or 3.

[Repeat cards 3-7 until all strata are used]

8	Blank card	Signifies the end of the problem

----------for NOPT=3 only----------

9	1-10	Tonnage for the year

[Repeat cards 1-8 or 1-9 for new problem]

Ouput

TABLE 1 - Listings of sample length frequencies by stratum.

TABLE 2 - Listings of estimated total length frequencies in number of fish by stratum.

TABLE 3 - Listings of estimated total length frequency in number of fish and percent for the year.

TABLE 4 - Listings of estimated total length frequency in tonnage by stratum.

TABLE 5 - Listings of estimated total length frequency in tonnage and and percent for the year.

TABLE 6 - For NOPT=3 only listing of total length frequency in number of fish and percent for the year.

Limitations

The maximum number of length intervals in any one sample is 200. The maximum number of strata in any one problem is 80. When running a sample of 70 strata and 80 length intervals the following compiler limits were observed:

Processor = 35.4 sec
I/O channel = 26.4 sec.
Memory = 1538.8 kwo-sec.

Total cost in an over-night priority was $2.46.

PROGRAM LISTING

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```
      3     DO 27 I=1,NS
     27     NL=MAX0(NL,N(I))
          9 NLP=6
            IF(NL-NFR.LT.201)NLP=5
            IF(NL-NFR.LT.161)NLP=4
            IF(NL-NFR.LT.121)NLP=3
            IF(NL-NFR.LT.81)NLP=2
            IF(NL-NFR.LT.41)NLP=1
            NP=INT(FLOAT(NS)/10+.9)*NLP
            J=1;K=NFR;LT=NFR-1
            DO 10 I=1,NP
            LT=LT+40;IF(NL.LE.LT)LT=NL
            PRINT 105,REGION,I,NP,DATE,(II,II=J,J+9)
            DO 70 JJ=J,J+9
            DO 70 II=K,LT
           70 TLF(JJ)=TLF(JJ)+A(II,JJ)+.5
            DO 20 II=K,LT
      C                   PRINT TABLE 1 LISTING OF SAMPLE
      C                   LENGTH FREQUENCIES
           20 PRINT 106,D(II),(A(II,M),M=J,J+9)
            K=K+40
            IF(LT.NE.NL)GO TO 888
            IF(IEOP)1000,1000,1001
         1000 PRINT 107,(TLF(II),II=J,J+9),(W(II),II=J,J+9),(E(II),II=J,J+9)
            GO TO 888
         1001 PRINT 707,(TLF(II),II=J,J+9),(W(II),II=J,J+9)
          888 PRINT 103
            DO 8 MM=J,J+4
            8 PRINT 104,MM,(L(JM,MM),JM=1,9),MM+5,(L(JM,MM+5),JM=1,9)
            IF(LT.NE.NL)GO TO 10
            K=NFR;J=J+10;LT=NFR-1
      10    CONTINUE
            DO 11 I=1,NS
            J=N(I) ; AD=0.
      C                   FIND TOTAL LENGTH,TOTAL NUMBER,
      C                   TOTAL WEIGHT AND CALCULATE
      C                   AVE. WT. AND AVE. LENGTH
            DO 12 K=NFR,J
            AL(I)=AL(I)+B(K,I)*A(K,I)
            AD=AD+A(K,I)
      12    AW(I)=AW(I)+A(K,I)*PA*(B(K,I)**PB)
            AL(I)=AL(I)/AD
            AW(I)=AW(I)/AD
            AN(I)=W(I)*1000./AW(I)
      C                   FIND NUMBER/STRATA AND SUM FOR
      C                   TOTAL LENGTH FREQUENCY
            DO 13 K=NFR,J
            A(K,I)=A(K,I)/AD
            A(K,I)=A(K,I)*AN(I)
            VN(I)=VN(I)+A(K,I)+.5
            TA(K)=TA(K)+A(K,I)
            TTA=TTA+A(K,I)
            IF(PL.EQ.0)GO TO 38
            IF(1.-B(K,I)/PL)13,13,23
         38 IF(PK.EQ.0)GO TO 13
      C                   CALCULATE AGE USING GROWTH
      C                   EQUATION(VON BERTALANFFY)
      23    AGE(I)=AGE(I)+A(K,I)*(PT-(ALOG(1.-B(K,I)/PL))/PK)
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```
C                       FIND AGE/STRATA
11      AGE(I)=AGE(I)/AN(I)
        DO 14 I=1,NS
C                       FIND C/E IN NUMBERS/STRATA
C                       SUM FOR TOTAL EFFORT AND C/E
        TTW=TTW+W(I)
        CEN(I)=AN(I)/E(I)
14      TTE=TTE+E(I)
C                       SUM FOR TOTAL AVERAGE LENGTH
        DO 30 K=NFR,NL
        TLEN=TLEN+TA(K)*D(K)
        IF(PL.EQ.0)GO TO 39
        IF(1.-D(K)/PL)30,30,24
   39   IF(PK.EQ.0)GO TO 30
24      TAGE=TAGE+TA(K)*(PT-(ALOG(1.-D(K)/PL))/PK)
30      CONTINUE
        TAGE=TAGE/TTA
        TLEN=TLEN/TTA
C                       FIND TOTAL C/E IN NUMBERS
        TCEN=TTA/TTE
        J=1;K=NFR;LT=NFR-1
C                       PRINT ESTIMATED CATCH/STRATA IN
C                       NUMBERS OF FISH TABLE 2
        DO 15 I=1,NP
        LT=LT+40;IF(NL.LE.LT)LT=NL
        PRINT 108,REGION,I,NP,DATE,(II,II=J,J+9)
        DO 21 II=K,LT
21      PRINT 109,D(II),(A(II,M),M=J,J+9)
        K=K+40
        IF(LT.NE.NL)GO TO 67
        IF(IEFOP)1002,1002,1003
 1002   PRINT 110,(VN(II),II=J,J+9),(CEN(II),II=J,J+9),(AL(II),II=J,J+9),
       *(W(II),II=J,J+9)
        GO TO 778
 1003   PRINT 708,(VN(II),II=J,J+9),                    (AL(II),II=J,J+9),
       *(W(II),II=J,J+9)
  778   IF(PK.EQ.0)GO TO 67
        PRINT 118,(AGE(II),II=J,J+9)
118     FORMAT(1H ,'AVE. AGE(MONTHS)'F8.1,9F10.1)
   67   PRINT 103
        DO 700 MM=J,J+4
700     PRINT 104,MM,(L(JM,MM),JM=1,9),MM+5,(L(JM,MM+5),JM=1,9)
        IF(LT.NE.NL)GO TO 15
        K=NFR;J=J+10;LT=NFR-1
15      CONTINUE
        IF(IPOPT.NE.1)GO TO 2002
        DO 2000 KOT=1,NS
        PUNCH 2001,(A(IOT,KOT),IOT=NFR,NL)
 2000   PUNCH 2003
 2001   FORMAT(8F10.0)
 2003   FORMAT('999')
 2002   CONTINUE
        IF(NL-NFR.LE.40)LN=1
        IF(NL-NFR.GT.40.AND.NL-NFR.LE.120)LN=3
        IF(NL-NFR.GT.120.AND.NL-NFR.LT.160)LN=4
        DO 25 J=NFR,NL,40
        DO 60 II=J,J+39
```

```
                    FIND PERCENT IN EACH INTERVAL
      PER(II)=TA(II)/TTA*100
      TPER=TPER+PER(II)
      IF(II.NE.1)GO TO 71
      APR(II)=PER(II)
      GO TO 60
   71 APR(II)=APR(II-1)+PER(II)
   60 CONTINUE
C                   PRINT TABLE 3 FOR YEARLY TOTALS IN
C                   NUMBERS OF FISH CAUGHT
      LT=J+39
      IF(NL.LE.LT)LT=NL
      PRINT 111,REGION,KN,LN,DATE,(D(I),TA(I),PER(I),APR(I),I=J,LT)
      DO 25 I=J,LT
      TI1=TI1+IFIX(TA(I)+.5)
   25 KN=KN+1
                    PRINT TOTAL NUMBER,NUMBER/EFFORT,
                    AVERAGE LENGTH, AND AVERAGE AGE
      IF(IEFOP)1004,1004,1005
 1004 PRINT 112,TI1,TPER,TCEN,TLEN,TTW
      GO TO 779
 1005 PRINT 772,TI1,TPER,      TLEN,TTW
  779 IF(PK.EQ.0)GO TO 68
      PRINT 119,TAGE
  119 FORMAT(1H ,'AVE. AGE(MONTHS)',2X,F8.3)
   68 CONTINUE
C                   OUTPUT OPTION IOPT=1 ENDS HERE
      IF(IOPT.EQ.1)GO TO 1
      DO 16 I=1,NS
      J=N(I)
      DO 17 K=NFR,J
C                   FIND WEIGHT/SIZE/STRATA
      A(K,I)=A(K,I)*(PA*(D(K)**PB))/1000.
   17 TW(K)=TW(K)+A(K,I)
C                   FIND CATCH/EFFORT IN WEIGHT
C                   FOR EACH STRATA
      CEW(I)=W(I)/E(I)
C                   SUM FOR TOTAL WEIGHT AND AVERAGE
C                   TOTAL WEIGHT
   16 CONTINUE
      TWT=TTW/TTA*1000.
      TCEW=TTW/TTE
C                   FIND TOTAL CATCH/EFFORT IN WEIGHT
      J=1;K=NFR;LT=NFR-1
      DO 19 I=1,NP
      LT=LT+40;IF(NL.LE.LT)LT=NL
C                   PRINT TABLE 4 FOR WEIGHT/SIZE/
C                   STRATA IN METRIC TONS
      PRINT 113,REGION,I,NP,DATE,(II,II=J,J+9)
      DO 18 II=K,LT
   18 PRINT 114,D(II),(A(II,M),M=J,J+9)
      K=K+40
      IF(LT.NE.NL)GO TO 780
      IF(IEFOP)1006,1006,1007
 1006 PRINT 115,(W(II),II=J,J+9),(CEW(II),II=J,J+9),(AW(II),II=J,J+9)
      GO TO 780
 1007 PRINT 775,(W(II),II=J,J+9),                    (AW(II),II=J,J+9)
```

```
      DO 701 MM=J,J+4
)1    PRINT 104,MM,(L(JM,MM),JM=1,9),MM+5,(L(JM,MM+5),JM=1,9)
      IF(LT.NE.NL)GO TO 19
      K=NFR;J=J+10;LT=NFR-1
 9    CONTINUE
      DO 26 J=NFR,NL,40
      DO 61 II=J,J+39
      IF(II.NE.1)GO TO 73
      CTW(II)=TW(II)
      GO TO 74
   73 CTW(II)=CTW(II-1)+TW(II)
   74 IF(TTW.EQ.0)GO TO 61
C                     FIND PERCENT WEIGHT/SIZE INTERVAL
      WPR(II)=TW(II)/TTW*100
      TPR=TPR+WPR(II)
      IF(II.NE.1)GO TO 72
      AWP(II)=WPR(II)
      GO TO 61
   72 AWP(II)=AWP(II-1)+WPR(II)
   61 CONTINUE
                      PRINT TABLE 5 FOR YEARLY TOTALS
                      IN WEIGHT OF FISH
      LT=J+39
      IF(NL.LE.LT)LT=NL
      PRINT 116,REGION,NK,LN,DATE,(D(I),TW(I),WPR(I),AWP(I),CTW(I),I=J
     *,LT)
   26 NK=NK+1
      IF(IEFOP)1008,1008,1009
 1008 PRINT 117,TTW,TPR,TCEW,TWT
      GO TO 781
 1009 PRINT 177,TTW,TPR,     TWT
C                     THE FOLLOWING ARE USED FOR
C                     STRATIFICATION OPTION THREE
  781 IF(NOPT.NE.3)GO TO 1
      NK=1;KN=1
C                     READ TOTAL TONNAGE FOR THE YEAR
C                     IN METRIC TONS
      READ(5,120)TTW
      TTA=TTW*1000
C                     FIND TOTAL NUMBER AND EXPAND OVER
C                     EACH SIZE INTERVAL
      TTA=TTA/TWT
      DO 550 J=NFR,NL,40
      DO 560 II=J,J+39
      TA(II)=PER(II)/100*TTA
      TW(II)=WPR(II)/100*TTW
      IF(II-1)562,561,562
  561 CTW(II)=TW(II)
      GO TO 560
  562 CTW(II)=CTW(II-1)+TW(II)
  560 CONTINUE
C                     PRINT TABLES FOR STRATIFICATION
C                     OPTION THREE
      PRINT 563
      LT=J+39
      IF(NL.LE.LT)LT=NL
      PRINT 564,REGION,KN,LN,DATE,(D(I),TA(I),PER(I),APR(I),I=J,LT)
  550 KN=KN+1
      IF(IEFOP)1010,1010,1011
```

```
1010 PRINT 112,TTA,TPER,TCEN,TLEN
     GO TO 782
1011 PRINT 772,TTA,TPER,TLEN
 782 DO 551 J=1,NL,40
     LT=J+39
     IF(NL.LE.LT)LT=NL
     PRINT 116,REGION,NK,LN,DATE,(D(I),TW(I),WPR(I),AWP(I),CTW(I),I=J
    *,LT)
 551 NK=NK+1
     IF(IEFOP)1012,1012,1013
1012 PRINT 117,TTW,TPR,TCEW,TWT
     GO TO 1
1013 PRINT 177,TTW,TPR,TWT
     GO TO 1
 120 FORMAT(F10.0)
 563 FORMAT(1H1,33(1H*),'¢THE FOLLOWING CHARTS ARE THE TRUE YEARLY TOTA
    *LS FOR OPTION FOUR!',33(1H*))
 564 FORMAT(1H ,3X,10A6,A2,'  SOUTHWEST FISHERIES CENTER LA JOLLA, CALI
    *FORNIA'/1H0,33X,'ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)',24X
    *,'PAGE ',I2,'/',I1/1H ,33X,43(1H*),20X,3A6,
    *                                    /1H ,5X,'MIDPOINT'/1H ,4X,'LENGT
    *H(CM)',3X,'NUMBERS',8X,'PERCENT',2X,'CUMULATIVE PERCENT',40(/1H ,I
    *3,F8.1,3X,F10.1,9X,F6.2,8X,F6.2))
 100 FORMAT(7F10.0,6X,4I1)
 101 FORMAT(2F10.0,9A6)
 102 FORMAT(20F4.1)
 103 FORMAT(1H0,'STRATUM',5X,'SPECIES',13X,'TITLE',23X,'STRATUM',5X,
    *'SPECIES',13X,'TITLE')
 104 FORMAT(1H ,I2,4X,9A6,I2,4X,9A6)
 105 FORMAT(1H1,3X,10A6,A2,'  SOUTHWEST FISHERIES CENTER LA JOLLA, CALI
    *FORNIA',
    *      /1H0,43X,'SAMPLE LENGTH FREQUENCIES',30X,'PAGE ',I2,'/',I2/,
    *1H ,   43X,25(1H*),28X,3A6,/,1H ,50X,'STRATUM',/1H ,6X,'MIDPOINT',
    */1H ,5X,'LENGTH (CM)',I8,9I10/)
 106 FORMAT(1H ,8X,F6.1,10F10.0)
 107 FORMAT(1H ,3X,111(1H-)/1H ,'TOTAL',9X,10F10.0,/1H ,'WEIGHT',/1H ,2
    *X,'(METRIC TONS)',F9.2,9F10.2,/1H ,'EFFORT',/1H ,2X,'(FISHING DAYS
    *)',F8.2,9F10.2)
 707 FORMAT(1H ,3X,111(1H-)/1H ,'TOTAL',9X,10F10.0,/1H ,'WEIGHT',/1H ,2
    *X,'(METRIC TONS)',F9.2,9F10.2)
 108 FORMAT(1H1,3X,10A6,A2,'  SOUTHWEST FISHERIES CENTER LA JOLLA, CALI
    *FORNIA',
    *      /1H0,40X,'ESTIMATED NUMBERS OF FISH CAUGHT',27X,'PAGE ',I2,'
    */',I2/,1H ,   40X,32(1H*),24X,3A6,/1H ,50X,'STRATUM',/1H ,6X,'MIDP
    *OINT'/1H ,5X,'LENGTH (CM)',I8,9I10/)
 109 FORMAT(1H ,8X,F6.1,10F10.0)
 110 FORMAT(1H ,3X,111(1H-)/1H ,'TOTAL',9X10F10.0/1H ,'NUMBER/EFFORT',1
    *X,10F10.1,/,1H ,'AVE. LENGTH(CM)',F9.1,9F10.1,/1H ,'WEIGHT',/1H ,'
    *(METRIC TONS) ',10F10.1)
 708 FORMAT(1H ,3X,111(1H-)/1H ,'TOTAL',9X10F10.0,/1H ,'AVE. LENGTH(CM)
    *',F9.1,9F10.1,/1H ,'WEIGHT',/1H ,'(METRIC TONS) ',10F10.1)
 111 FORMAT(1H1,3X,10A6,A2,'  SOUTHWEST FISHERIES CENTER LA JOLLA, CALI
    *FORNIA',/1H0,33X,'ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)',24X
    *,'PAGE ',I2,'/',I1/1H ,33X,43(1H*),20X,3A6,
    *                                    /1H ,5X,'MIDPOINT'/1H ,4X,'LENGT
    *H(CM)',3X,'NUMBERS',8X,'PERCENT',2X,'CUMULATIVE PERCENT',40(/1H ,3
    *X,F8.1,3X,F10.0,9X,F6.2,8X,F6.2))
```

```
 12   FORMAT(1H ,53(1H-)/1H ,'TOTAL',6X,F13.0,9X,F6.2,/1H ,'NUMBER/FFFOR
     *T',3X,F10.3/1H ,'AVE. LENGTH(CM)',2X,F9.3,/1H ,'WEIGHT',/1H ,'(MET
     *RIC TONS)',2X,F11.1)
  772 FORMAT(1H ,53(1H-)/1H ,'TOTAL',6X,F13.0,9X,F6.2,/1H ,'AVE. LENGTH(
     *CM)',2X,F9.3,/1H ,'WEIGHT',/1H ,'(METRIC TONS)',2X,F11.1)
  113 FORMAT(1H1,3X,10A6,A2,'  SOUTHWEST FISHERIES CENTER LA JOLLA, CALI
     *FORNIA',
     *      /1H0,42X,'WEIGHT (METRIC TONS) CAUGHT',30X,'PAGE ',I2,'/',I2
     */1H ,   42X,27(1H*),27X,3A6,/1H ,50X,'STRATUM',/1H ,6X,'MIDPOINT',
     */1H ,5X,'LENGTH (CM)',I8,9I10/)
 114   FORMAT(1H ,8X,F6.1,10F10.3)
 115   FORMAT(1H ,3X,111(1H-)/1H ,'TOTAL',9X,10F10.3,/1H ,'WEIGHT/',/1H ,
     *2X,'DAYS FISHING',10F10.3,/1H ,'AVE. WEIGHT/'/1H ,2X,'FISH(KG)',4X
     *,10F10.3)
  775 FORMAT(1H ,3X,111(1H-)/1H ,'TOTAL',9X,10F10.3,
     *                        ,  /1H ,'AVE. WEIGHT/'/1H ,2X,'FISH(KG)',4X
     *,10F10.3)
  116 FORMAT(1H1,3X,10A6,A2,'  SOUTHWEST FISHERIES CENTER LA JOLLA, CALI
     *FORNIA',/1H0,34X,'ESTIMATED TOTAL WEIGHT OF FISH(ALL STRATA)',30X,
     *'PAGE ',I2,'/',
     *  I1,/1H ,   40X,42(1H*),20X,3A6,/1H ,6X,'MIDPOINT',/1H ,5X,'LENGT
     *H(CM)',5X,'WEIGHT(METRIC TONS)',5X,'PERCENT',2X,'CUMULATIVE PERCEN
     *T',2X,'CUMULATIVE WEIGHT',40(/1H ,3X,5X,F6.1,9X,F10.3,11X,F6.2,8X,
     *F6.2,10X,F10.3))
 117   FORMAT(1H ,84(1H-)/1H ,'TOTAL',18X,F10.3,11X,F6.2/1H ,'WEIGHT/DAYS
     * FISHING'4X,F10.3/1H ,'AVERAGE WEIGHT/FISH(KG)',F10.3)
  177 FORMAT(1H ,84(1H-)/1H ,'TOTAL',18X,F10.3,11X,F6.2,
     *                    /1H ,'AVERAGE WEIGHT/FISH(KG)',F10.3)
 50    CONTINUE
       END
```

```
      SUBROUTINE ONE(*)
C                     THIS IS THE FIRST METHOD OF
C                     STRATIFICATION OPTION ONE
C                     THE SUBROUTINE WEIGHTS EACH SAMPLE EQUALLY TO 50 FISH
C                     AND COMBINES THEM INTO ONE
C                     LENGTH FREQUENCY FOR THE
C                     CORRESPONDING TIME AREA STRATA
      COMMON A(200,80),N(80),NS,SI,SIZ,PA,PB,NFR
      DIMENSION B(200,80),W(80),E(80)
      NF=1;I=1
C                     READ WEIGHT(IN SHORT TONS) AND
C                     EFFORT
    9 READ(5,20)W(I),E(I)
      IFLAG=0
   20 FORMAT(2F10.0)
      IF(W(I).EQ.0)GO TO 3
      IF(W(I).EQ.9999.)GO TO 11
C                     READ LENGTH FREQUENCY SAMPLE #1
    1 READ(5,10)(B(J,I),J=NF,NF+19)
      IF(B(NF,I).EQ.999.)GO TO 2
      IF(IFLAG.EQ.1)GO TO 51
      DO 50 INM=NF,NF+19
   50 IF(B(INM,I).NE.0.)GO TO 52
      GO TO 51
   52 NFR=MIN0(NFR,INM)
      IFLAG=1
   51 NF=NF+20
      GO TO 1
    2 B(NF,I)=0
      DO 907 IZ=NF-20,NF
      IF(B(IZ,I).NE.0.)NL=IZ
907   CONTINUE
      N(NS)=MAX0(N(NS),NL)
      DO 5 J=1,NF
    5 TOT=TOT+B(J,I)
C                     IF SAMPLE TOTAL IS MORE THAN 50
C                     REDUCE TO 50
      IF(TOT.EQ.50.)GO TO 6
      DO 7 J=1,NF
    7 B(J,I)=(B(J,I)/TOT)*50
    6 I=I+1
      NF=1;TOT=0
      GO TO 9
C                     COMBINE THESE SAMPLES INTO ONE
C                     FREQUENCY FOR THE CORRESPONDING
C                     TIME AREA STRATA
    3 DO 4 II=1,I
      DO 4 K=1,N(NS)
      A(K,NS)=A(K,NS)+B(K,II)
    4 CONTINUE
   10 FORMAT(20F4.1)
      RETURN 1
C                     IF 9999. USE LENGTH FREQUENCY
C                     OF PREVIOUS STRATA
   11 N(NS)=N(NS-1)
      DO 12 K=1,N(NS)
   12 A(K,NS)=A(K,NS-1)
      RETURN 1
      END
```

```
C                     THIS IS THE SECOND METHOD OF
C                     STRATIFICATION OPTION TWO
C                     THE SUBROUTINE WEIGHTS EACH SAMPLE BY THE TONNAGE OF
C                     THE SAMPLE
C                     AND COMBINES THE
C                     SAMPLES INTO THE CORRESPONDING
C                     TIME AREA STRATA
      COMMON A(200,80),N(80),NS,SI,SIZ,PA,PB,NFR
      DIMENSION W(80),E(80),D(200),B(200,80)
      I=1;NF=1
      D(1)=SI
      DO 1 II=2,200
    1 D(II)=(II-1)*SIZ+SI
C                     READ WEIGHT IN SHORT TONS AND
C                     EFFORT
    2 READ(5,20)W(I),E(I)
      IFLAG=0
      IF(W(I).EQ.0)GO TO 4
      IF(W(I).EQ.9999.)GO TO 9
C                     READ LENGTH FREQUENCY FOR FIRST
C                     SAMPLE
    3 READ(5,10)(B(J,I),J=NF,NF+19)
      IF(B(NF,I).EQ.999.)GO TO 5
      IF(IFLAG.EQ.1)GO TO 51
      DO 50 INM=NF,NF+19
   50 IF(B(INM,I).NE.0.)GO TO 52
      GO TO 51
   52 NFR=MIN0(NFR,INM)
      IFLAG=1
   51 NF=NF+20
      GO TO 3
    5 B(NF,I)=0
      DO 907 IZ=NF-20,NF
      IF(B(IZ,I).NE.0.)NL=IZ
907   CONTINUE
      N(NS)=MAX0(N(NS),NL)
      DO 6 K=1,NF
      TOT=TOT+B(K,I)
C                     FIND AVERAGE WEIGHT TOTAL NUMBER
C                     AND EXPAND OVER THE SAMPLE
    6 TW=TW+B(K,I)*PA*(D(K)**PB)
      AW=TW/TOT
      TN=W(I)*907.185/AW
      DO 7 K=1,NF
    7 B(K,I)=B(K,I)/TOT*TN
      TOT=0:TW=0:NF=1:I=I+1
      GO TO 2
C                     COMBINE INTO THE CORRESPONDING
C                     TIME AREA STRATA
    4 DO 8 II=1,I
      DO 8 K=1,N(NS)
    8 A(K,NS)=A(K,NS)+B(K,II)
      RETURN 1
C                     IF 9999. USE LENGTH FREQUENCY OF
C                     PREVIOUS SAMPLE
    9 N(NS)=N(NS-1)
      DO 11 K=1,N(NS)
   11 A(K,NS)=A(K,NS-1)
      RETURN 1
   10 FORMAT(20F4.1)
   20 FORMAT(2F10.0)
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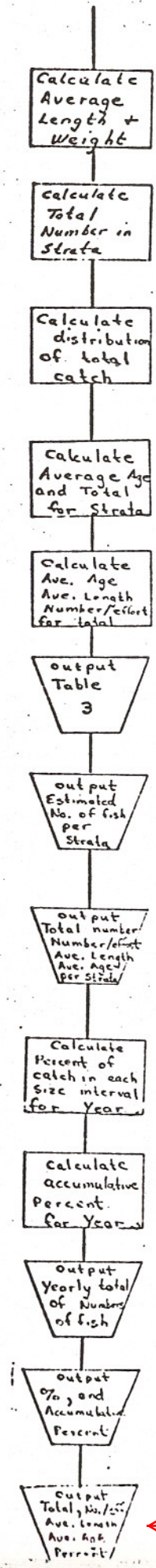
FLOW CHART



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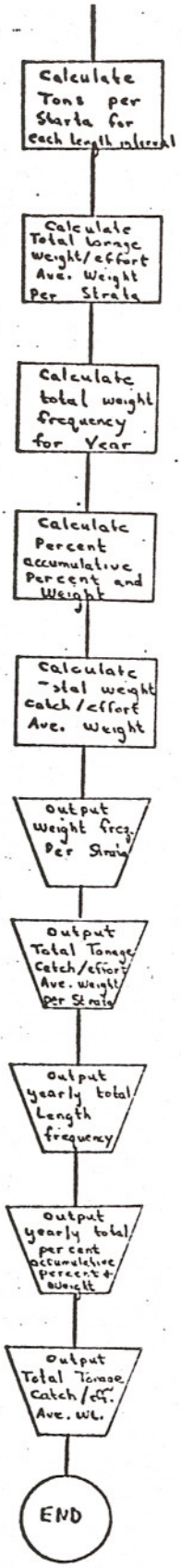
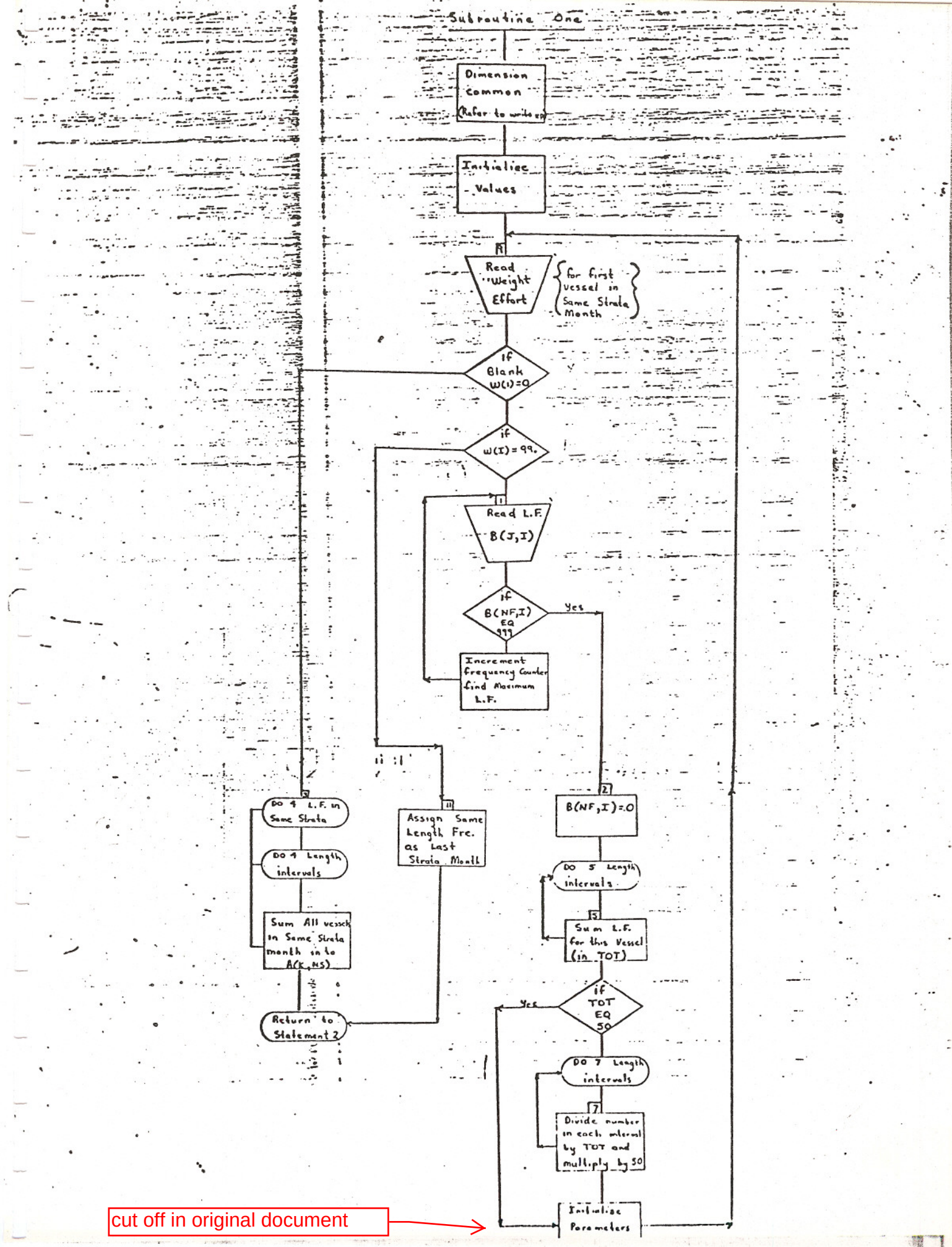

Calculate Tons per Strata for each length interval
Calculate Total tonnage weight/effort Ave. Weight Per Strata
Calculate total weight frequency for Year
Calculate Percent accumulative Percent and Weight
Calculate total weight catch/effort Ave. Weight
Output Weight freq. Per Strata
Output Total Tonnage Catch/effort Ave. Weight per Strata
Output yearly total Length frequency
Output yearly total percent accumulative percent & weight
Output Total Tonnage Catch/eff. Ave. Wt.
END



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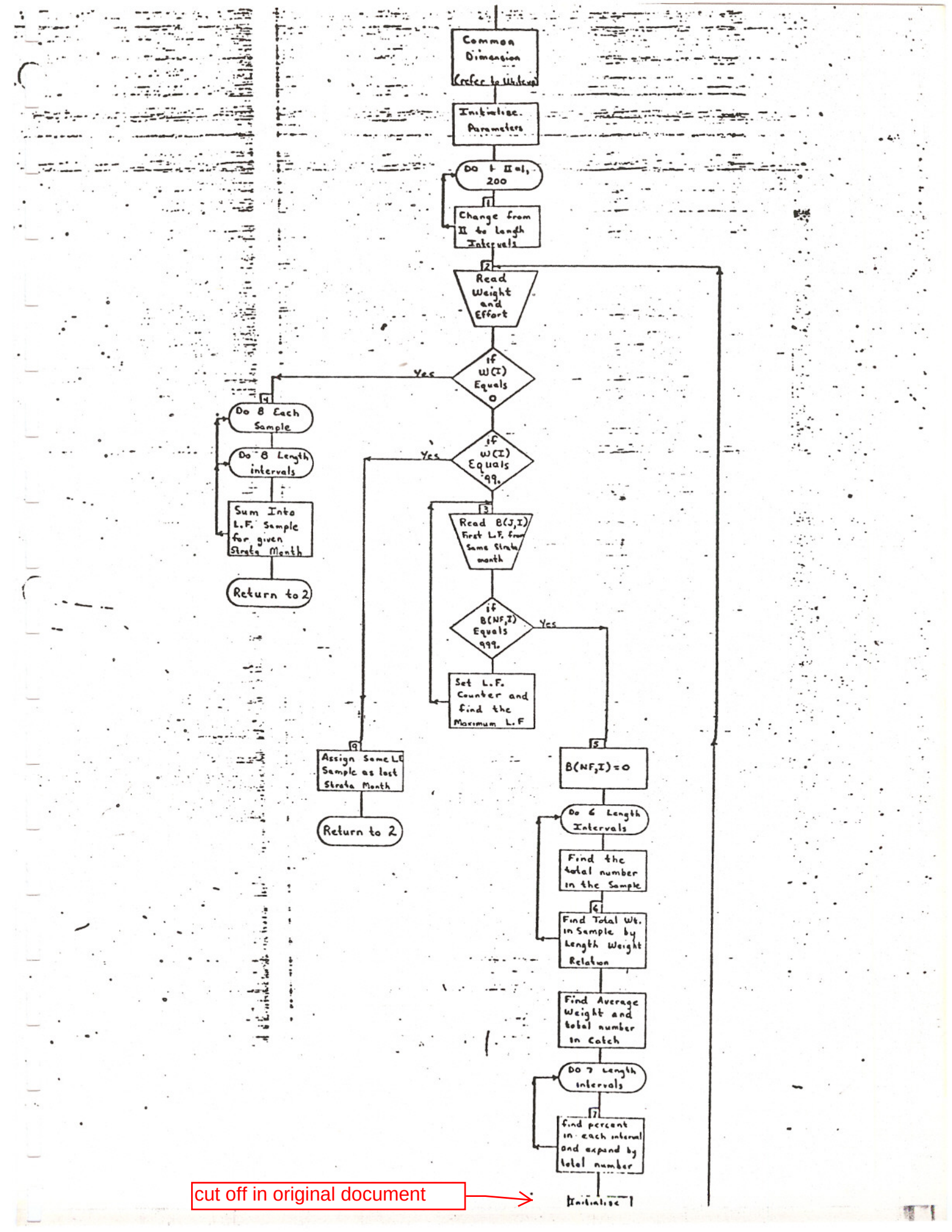
Common Dimension (refer to Widtwo)
Initialise Parameters
DO 1 II=1, 200
1
Change from II to length Intervals
2
Read Weight and Effort
if W(I) Equals 0
Yes
4
Do 8 Each Sample
Do 8 Length intervals
Sum Into L.F. Sample for given Strata Month
Return to 2
if W(I) Equals 999.
Yes
3
Read B(J,I) First L.F. from same Strata month
if B(NF,I) Equals 999.
Yes
Set L.F. Counter and find the Maximum L.F
9
Assign Same LF Sample as last Strata Month
Return to 2
5
B(NF,I)=0
Do 6 Length Intervals
Find the total number in the Sample
6
Find Total Wt. in Sample by Length Weight Relation
Find Average Weight and total number in Catch
DO 7 Length intervals
7
find percent in each interval and expand by total number
Initialise I
cut off in original document

APPENDIX X

Length-Frequency Distribution of Atlantic Tunas from transshipments of foreign vessels into Puerto Rico in 1976 (Final)

Prepared by

National Marine Fisheries Service
Southwest Fisheries Center
La Jolla, CA 92038

Table of Contents

Tonnage (metric tons) and number of fish sampled
from transshipments of Atlantic tunas
by foreign vessels into Puerto Rico in
1976 (final)

GEAR/AREA	QUARTER	YELLOWFIN		SKIPJACK		BIGEYE		ALBACORE		LITTLE TUNNY		AUXIS	
		TONNAGE	# FISH	TONNAGE	# FISH	TONNAGE	# FISH	TONNAGE	# FISH	TONNAGE	# FISH	TONNAGE	# FISH
Purse Seine Eastern Atlantic	3	278	75	2210	656								
	4			1532	507								
Baitboat E. Atl.	1	314	652	482	302	27	56						
	2	671	1253	1634	753	7	17						
	3	702	1650	2060	967	2	23			2	66	<1	50
	4	685	1322	1118	762	41	131						
Unknown Gears E. Atl.	1	156	100	515	50								
	2	1	15										
Longline N. Atl.	1							950	150				
	3							71	50				
S. Atl.	3							1133	150				
	4			5	50			546	100				

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
37.0	27685.	0.	0.	0.	0.	0.	0.	0.	0.	0.
38.0	13843.	0.	0.	0.	0.	0.	0.	0.	0.	0.
39.0	6921.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40.0	13843.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41.0	13843.	0.	0.	0.	0.	0.	0.	0.	0.	0.
42.0	6921.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	13843.	0.	0.	0.	0.	0.	0.	0.	0.	0.
44.0	6921.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45.0	27685.	0.	0.	0.	0.	0.	0.	0.	0.	0.
46.0	13843.	0.	0.	0.	0.	0.	0.	0.	0.	0.
47.0	6921.	0.	0.	0.	0.	0.	0.	0.	0.	0.
48.0	6921.	0.	0.	0.	0.	0.	0.	0.	0.	0.
49.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	6921.	0.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	6921.	0.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
54.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
62.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
64.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
66.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
74.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	PURSE SEINE QUARTER 3
2		
3		
4		
5		
6		
7		
8		
9		
10		

ESTIMATED NUMBERS OF FISH CAUGHT
****

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
77.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
82.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
83.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
84.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
86.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
88.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
89.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
92.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
93.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
94.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
96.0	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.
97.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
98.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
99.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
100.0	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101.0	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.
102.0	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.
103.0	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.
104.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
106.0	33.	0.	0.	0.	0.	0.	0.	0.	0.	0.
107.0	33.	0.	0.	0.	0.	0.	0.	0.	0.	0.
108.0	16.	0.	0.	0.	0.	0.	0.	0.	0.	0.
109.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
110.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
112.0	33.	0.	0.	0.	0.	0.	0.	0.	0.	0.
113.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
114.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
116.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE	STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	PURSE SEINE QUARTER 3	6		
2			7		
3			8		
4			9		
5			10		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
117.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
118.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
119.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
120.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
121.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
122.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
123.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
124.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
126.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
127.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
128.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	173439.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	42.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	278.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVE. AGE(MONTHS)	14.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE	STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	PURSE SEINE QUARTER 3	6		
2			7		
3			8		
4			9		
5			10		

4

...6 Y...WFIN ...STER... ...LAN... FOR... FI... ...FIN S... ...WES... SHE... CEN... LA... A... ...FORN...

ESTIMATED NUMBERS OF FISH CAUGHT

JUNE 15, 1977

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
29.0	0.	0.	418.	0.	0.	0.	0.	0.	0.	0.
30.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
32.0	0.	295.	418.	0.	0.	0.	0.	0.	0.	0.
33.0	0.	57.	418.	0.	0.	0.	0.	0.	0.	0.
34.0	0.	57.	1566.	442.	0.	0.	0.	0.	0.	0.
35.0	0.	219.	4356.	2129.	0.	0.	0.	0.	0.	0.
36.0	0.	731.	4264.	1468.	0.	0.	0.	0.	0.	0.
37.0	191.	1685.	7471.	1400.	0.	0.	0.	0.	0.	0.
38.0	1079.	2833.	16095.	2797.	0.	0.	0.	0.	0.	0.
39.0	745.	3072.	26539.	6242.	0.	0.	0.	0.	0.	0.
40.0	188.	5760.	57518.	8536.	0.	0.	0.	0.	0.	0.
41.0	1605.	12753.	53456.	14855.	0.	0.	0.	0.	0.	0.
42.0	1114.	10351.	63323.	25365.	0.	0.	0.	0.	0.	0.
43.0	1197.	11565.	40291.	28879.	0.	0.	0.	0.	0.	0.
44.0	1985.	20834.	24036.	39532.	0.	0.	0.	0.	0.	0.
45.0	2166.	16379.	17301.	34532.	0.	0.	0.	0.	0.	0.
46.0	3267.	18843.	9123.	29738.	0.	0.	0.	0.	0.	0.
47.0	7602.	21153.	6858.	13238.	0.	0.	0.	0.	0.	0.
48.0	14390.	15385.	5823.	11301.	0.	0.	0.	0.	0.	0.
49.0	22969.	16044.	5492.	5426.	0.	0.	0.	0.	0.	0.
50.0	26722.	4969.	4158.	3522.	0.	0.	0.	0.	0.	0.
51.0	18841.	30105.	1044.	4914.	0.	0.	0.	0.	0.	0.
52.0	13358.	24256.	2991.	4956.	0.	0.	0.	0.	0.	0.
53.0	3415.	11462.	1822.	3662.	0.	0.	0.	0.	0.	0.
54.0	3559.	19654.	2262.	2408.	0.	0.	0.	0.	0.	0.
55.0	1483.	6855.	3321.	2255.	0.	0.	0.	0.	0.	0.
56.0	3164.	10889.	4359.	3730.	0.	0.	0.	0.	0.	0.
57.0	202.	4141.	4964.	2655.	0.	0.	0.	0.	0.	0.
58.0	716.	401.	4265.	3727.	0.	0.	0.	0.	0.	0.
59.0	357.	3764.	13802.	2079.	0.	0.	0.	0.	0.	0.
60.0	92.	241.	3819.	2043.	0.	0.	0.	0.	0.	0.
61.0	10.	0.	2015.	1823.	0.	0.	0.	0.	0.	0.
62.0	195.	0.	1463.	1362.	0.	0.	0.	0.	0.	0.
63.0	171.	3363.	1022.	1457.	0.	0.	0.	0.	0.	0.
64.0	6.	29.	875.	1382.	0.	0.	0.	0.	0.	0.
65.0	4.	315.	745.	1425.	0.	0.	0.	0.	0.	0.
66.0	12.	58.	723.	2521.	0.	0.	0.	0.	0.	0.
67.0	8.	89.	26.	1324.	0.	0.	0.	0.	0.	0.
68.0	4.	99.	211.	2144.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE	STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	BAITBOAT QUARTER 1	6		
2	1976 YELLOWFIN	BAITBOAT QUARTER 2	7		
3	1976 YELLOWFIN	BAITBOAT QUARTER 3	8		
4	1976 YELLOWFIN	BAITBOAT QUARTER 4	9		
5			10		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
69.0	11.	121.	37.	2219.	0.	0.	0.	0.	0.	0.
70.0	16.	33.	0.	1498.	0.	0.	0.	0.	0.	0.
71.0	11.	54.	19.	2439.	0.	0.	0.	0.	0.	0.
72.0	13.	42.	10.	2561.	0.	0.	0.	0.	0.	0.
73.0	13.	1.	140.	1227.	0.	0.	0.	0.	0.	0.
74.0	11.	34.	155.	1369.	0.	0.	0.	0.	0.	0.
75.0	8.	8.	10.	510.	0.	0.	0.	0.	0.	0.
76.0	12.	43.	45.	1329.	0.	0.	0.	0.	0.	0.
77.0	11.	59.	400.	737.	0.	0.	0.	0.	0.	0.
78.0	19.	242.	179.	568.	0.	0.	0.	0.	0.	0.
79.0	11.	183.	55.	547.	0.	0.	0.	0.	0.	0.
80.0	4.	148.	48.	404.	0.	0.	0.	0.	0.	0.
81.0	17.	151.	39.	241.	0.	0.	0.	0.	0.	0.
82.0	5.	33.	89.	313.	0.	0.	0.	0.	0.	0.
83.0	7.	160.	19.	144.	0.	0.	0.	0.	0.	0.
84.0	7.	79.	29.	261.	0.	0.	0.	0.	0.	0.
85.0	8.	502.	19.	118.	0.	0.	0.	0.	0.	0.
86.0	5.	123.	57.	38.	0.	0.	0.	0.	0.	0.
87.0	1.	280.	55.	55.	0.	0.	0.	0.	0.	0.
88.0	4.	303.	22.	14.	0.	0.	0.	0.	0.	0.
89.0	4.	12.	34.	3.	0.	0.	0.	0.	0.	0.
90.0	5.	196.	31.	14.	0.	0.	0.	0.	0.	0.
91.0	4.	67.	5.	0.	0.	0.	0.	0.	0.	0.
92.0	0.	67.	2.	11.	0.	0.	0.	0.	0.	0.
93.0	4.	70.	5.	11.	0.	0.	0.	0.	0.	0.
94.0	4.	11.	12.	3.	0.	0.	0.	0.	0.	0.
95.0	0.	2.	7.	0.	0.	0.	0.	0.	0.	0.
96.0	1.	2.	7.	0.	0.	0.	0.	0.	0.	0.
97.0	9.	7.	10.	3.	0.	0.	0.	0.	0.	0.
98.0	0.	2.	2.	0.	0.	0.	0.	0.	0.	0.
99.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
100.0	4.	2.	10.	6.	0.	0.	0.	0.	0.	0.
101.0	0.	0.	12.	0.	0.	0.	0.	0.	0.	0.
102.0	0.	2.	7.	3.	0.	0.	0.	0.	0.	0.
103.0	0.	0.	12.	0.	0.	0.	0.	0.	0.	0.
104.0	0.	0.	7.	0.	0.	0.	0.	0.	0.	0.
105.0	0.	2.	5.	0.	0.	0.	0.	0.	0.	0.
106.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
107.0	0.	0.	5.	6.	0.	0.	0.	0.	0.	0.
108.0	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	BAITBOAT QUARTER 1
2	1976 YELLOWFIN	BAITBOAT QUARTER 2
3	1976 YELLOWFIN	BAITBOAT QUARTER 3
4	1976 YELLOWFIN	BAITBOAT QUARTER 4
5		

STRATUM	SPECIES	TITLE
6		
7		
8		
9		
10		

ESTIMATED NUMBERS OF FISH CAUGHT

STRATUM

MIDPOINT LENGTH (CM)	1	2	3	4	5	6	7	8	9	10
109.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
110.0	0.	0.	0.	3.	0.	0.	0.	0.	0.	0.
111.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
112.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
113.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
114.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
116.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
117.0	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
118.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
119.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
120.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
121.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
122.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
123.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
124.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
126.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
127.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
128.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
129.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
131.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
132.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
133.0	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
134.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
136.0	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
137.0	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
TOTAL	130848.	281820.	400261.	291924.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	49.6	48.9	43.8	47.8	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	314.4	671.4	702.1	684.8	0.0	0.0	0.0	0.0	0.0	0.0
AVE. AGE(MONTHS)	15.9	15.8	14.8	15.6	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	BAITBOAT QUARTER 1
2	1976 YELLOWFIN	BAITBOAT QUARTER 2
3	1976 YELLOWFIN	BAITBOAT QUARTER 3
4	1976 YELLOWFIN	BAITBOAT QUARTER 4
5		
6		
7		
8		
9		
10		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

JUNE 15, 1977

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
29.0	418.	0.04	0.04
30.0	0.	0.00	0.04
31.0	0.	0.00	0.04
32.0	713.	0.06	0.10
33.0	475.	0.04	0.15
34.0	2064.	0.19	0.33
35.0	6705.	0.61	0.94
36.0	6464.	0.59	1.52
37.0	10747.	0.97	2.50
38.0	22804.	2.06	4.56
39.0	36598.	3.31	7.87
40.0	72002.	6.52	14.39
41.0	82670.	7.48	21.87
42.0	100153.	9.06	30.94
43.0	81932.	7.42	38.35
44.0	86387.	7.82	46.17
45.0	70377.	6.37	52.54
46.0	60971.	5.52	58.06
47.0	48850.	4.42	62.48
48.0	46899.	4.24	66.73
49.0	49930.	4.52	71.25
50.0	39370.	3.56	74.81
51.0	54904.	4.97	79.78
52.0	45561.	4.12	83.90
53.0	20360.	1.84	85.75
54.0	27882.	2.52	88.27
55.0	13913.	1.26	89.53
56.0	22041.	1.99	91.52
57.0	11963.	1.08	92.61
58.0	9009.	0.82	93.42
59.0	20002.	1.81	95.23
60.0	6195.	0.56	95.79
61.0	3847.	0.35	96.14
62.0	3020.	0.27	96.41
63.0	6013.	0.54	96.96
64.0	2292.	0.21	97.17
65.0	2489.	0.23	97.39
66.0	3313.	0.30	97.69
67.0	1446.	0.13	97.82
68.0	2457.	0.22	98.04

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
69.0	2388.	0.22	98.26
70.0	1547.	0.14	98.40
71.0	2523.	0.23	98.63
72.0	2626.	0.24	98.87
73.0	1382.	0.13	98.99
74.0	1569.	0.14	99.13
75.0	607.	0.05	99.19
76.0	1429.	0.13	99.32
77.0	1207.	0.11	99.43
78.0	1008.	0.09	99.52
79.0	795.	0.07	99.59
80.0	605.	0.05	99.65
81.0	447.	0.04	99.69
82.0	439.	0.04	99.73
83.0	331.	0.03	99.76
84.0	376.	0.03	99.79
85.0	647.	0.06	99.85
86.0	224.	0.02	99.87
87.0	391.	0.04	99.90
88.0	343.	0.03	99.93
89.0	52.	0.00	99.94
90.0	246.	0.02	99.96
91.0	76.	0.01	99.97
92.0	81.	0.01	99.98
93.0	89.	0.01	99.98
94.0	29.	0.00	99.99
95.0	9.	0.00	99.99
96.0	10.	0.00	99.99
97.0	28.	0.00	99.99
98.0	4.	0.00	99.99
99.0	2.	0.00	99.99
100.0	21.	0.00	99.99
101.0	12.	0.00	99.99
102.0	12.	0.00	100.00
103.0	12.	0.00	100.00
104.0	7.	0.00	100.00
105.0	6.	0.00	100.00
106.0	0.	0.00	100.00
107.0	10.	0.00	100.00
108.0	2.	0.00	100.00

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
109.0	0.	0.00	100.00
110.0	3.	0.00	100.00
111.0	0.	0.00	100.00
112.0	0.	0.00	100.00
113.0	0.	0.00	100.00
114.0	0.	0.00	100.00
115.0	2.	0.00	100.00
116.0	0.	0.00	100.00
117.0	2.	0.00	100.00
118.0	0.	0.00	100.00
119.0	0.	0.00	100.00
120.0	0.	0.00	100.00
121.0	0.	0.00	100.00
122.0	0.	0.00	100.00
123.0	0.	0.00	100.00
124.0	0.	0.00	100.00
125.0	0.	0.00	100.00
126.0	0.	0.00	100.00
127.0	0.	0.00	100.00
128.0	0.	0.00	100.00
129.0	0.	0.00	100.00
130.0	0.	0.00	100.00
131.0	0.	0.00	100.00
132.0	0.	0.00	100.00
133.0	1.	0.00	100.00
134.0	0.	0.00	100.00
135.0	0.	0.00	100.00
136.0	1.	0.00	100.00
137.0	2.	0.00	100.00

TOTAL	1104839.	100.00
AVE. LENGTH(CM)	46.837	
WEIGHT (METRIC TONS)	2372.7	
AVE. AGE(MONTHS)	15.374	

ESTIMATED NUMBERS OF FISH CAUGHT
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MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
42.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
44.0	1752.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45.0	350.	22.	0.	0.	0.	0.	0.	0.	0.	0.
46.0	1051.	22.	0.	0.	0.	0.	0.	0.	0.	0.
47.0	2452.	0.	0.	0.	0.	0.	0.	0.	0.	0.
48.0	1401.	0.	0.	0.	0.	0.	0.	0.	0.	0.
49.0	2452.	22.	0.	0.	0.	0.	0.	0.	0.	0.
50.0	3153.	22.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	1401.	0.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	1752.	45.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	701.	22.	0.	0.	0.	0.	0.	0.	0.	0.
54.0	350.	111.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	350.	45.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	350.	22.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	1051.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	1051.	0.	0.	0.	0.	0.	0.	0.	0.	0.
62.0	1401.	0.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	1051.	0.	0.	0.	0.	0.	0.	0.	0.	0.
64.0	1401.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65.0	1051.	0.	0.	0.	0.	0.	0.	0.	0.	0.
66.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	1401.	0.	0.	0.	0.	0.	0.	0.	0.	0.
74.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE		STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	UNKOWN GEARS	QUARTER 1	6		
2	1976 YELLOWFIN	UNKOWN GEARS	QUARTER 2	7		
3				8		
4				9		
5				10		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
82.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
83.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
84.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
86.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
88.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
89.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	701.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
92.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
93.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
94.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
96.0	350.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	35039.	333.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	58.6	52.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	156.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVE. AGE(MONTHS)	17.8	16.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE		STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	UNKOWN GEARS	QUARTER 1	6		
2	1976 YELLOWFIN	UNKOWN GEARS	QUARTER 2	7		
3				8		
4				9		
5				10		

1976 SKIPJACK EASTERN ATLANTIC FOREIGN FLAGS (FINAL) . SOUTHWEST FISHERIES CENTER LA JOLLA, CALIFORNIA

ESTIMATED NUMBERS OF FISH CAUGHT
****

JUNE 15, 1977

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
36.0	259.	870.	0.	0.	0.	0.	0.	0.	0.	0.
37.0	4919.	5113.	0.	0.	0.	0.	0.	0.	0.	0.
38.0	8615.	22248.	0.	0.	0.	0.	0.	0.	0.	0.
39.0	7870.	26087.	0.	0.	0.	0.	0.	0.	0.	0.
40.0	30897.	25755.	0.	0.	0.	0.	0.	0.	0.	0.
41.0	103516.	38147.	0.	0.	0.	0.	0.	0.	0.	0.
42.0	114044.	48128.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	163104.	59958.	0.	0.	0.	0.	0.	0.	0.	0.
44.0	151721.	70703.	0.	0.	0.	0.	0.	0.	0.	0.
45.0	139142.	82901.	0.	0.	0.	0.	0.	0.	0.	0.
46.0	106981.	63716.	0.	0.	0.	0.	0.	0.	0.	0.
47.0	64462.	67728.	0.	0.	0.	0.	0.	0.	0.	0.
48.0	75017.	38765.	0.	0.	0.	0.	0.	0.	0.	0.
49.0	51753.	33479.	0.	0.	0.	0.	0.	0.	0.	0.
50.0	49747.	23964.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	37028.	29637.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	11209.	10199.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	24413.	25213.	0.	0.	0.	0.	0.	0.	0.	0.
54.0	16595.	7035.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	5860.	10325.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	8651.	8521.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	5444.	7822.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	2032.	2699.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	0.	55420.	0.	0.	0.	0.	0.	0.	0.	0.
60.0	3415.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	2985.	0.	0.	0.	0.	0.	0.	0.	0.	0.
62.0	4252.	0.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	4904.	0.	0.	0.	0.	0.	0.	0.	0.	0.
64.0	4406.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65.0	2545.	0.	0.	0.	0.	0.	0.	0.	0.	0.
66.0	171.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	171.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	1206128.	764424.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	45.6	46.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	2209.5	1532.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 SKIPJACK	PURSE SEINE QUARTER 3
2	1976 SKIPJACK	PURSE SEINE QUARTER 4
3		
4		
5		
6		
7		
8		
9		
10		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
36.0	1129.	0.06	0.06
37.0	10032.	0.51	0.57
38.0	30863.	1.57	2.13
39.0	33957.	1.72	3.86
40.0	56652.	2.87	6.73
41.0	141663.	7.19	13.92
42.0	162172.	8.23	22.15
43.0	223063.	11.32	33.47
44.0	222423.	11.29	44.76
45.0	222043.	11.27	56.02
46.0	170698.	8.66	64.69
47.0	132190.	6.71	71.40
48.0	113782.	5.77	77.17
49.0	85223.	4.32	81.49
50.0	73710.	3.74	85.23
51.0	66665.	3.38	88.62
52.0	21409.	1.09	89.70
53.0	49625.	2.52	92.22
54.0	23630.	1.20	93.42
55.0	16185.	0.82	94.24
56.0	17172.	0.87	95.11
57.0	13267.	0.67	95.79
58.0	4731.	0.24	96.03
59.0	55420.	2.81	98.84
60.0	3415.	0.17	99.01
61.0	2985.	0.15	99.17
62.0	4252.	0.22	99.38
63.0	4904.	0.25	99.63
64.0	4406.	0.22	99.85
65.0	2545.	0.13	99.98
66.0	171.	0.01	99.99
67.0	0.	0.00	99.99
68.0	0.	0.00	99.99
69.0	171.	0.01	100.00
TOTAL	1970553.	100.00	
AVE. LENGTH(CM)	45.954		
WEIGHT (METRIC TONS)	3742.0		

ESTIMATED NUMBERS OF FISH CAUGHT
****

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
30.0	0.	0.	0.	1695.	0.	0.	0.	0.	0.	0.
31.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
32.0	0.	0.	1179.	1007.	0.	0.	0.	0.	0.	0.
33.0	1048.	0.	426.	0.	0.	0.	0.	0.	0.	0.
34.0	0.	729.	3803.	2119.	0.	0.	0.	0.	0.	0.
35.0	0.	0.	8360.	7707.	0.	0.	0.	0.	0.	0.
36.0	1048.	0.	19198.	8215.	0.	0.	0.	0.	0.	0.
37.0	309.	0.	36274.	37703.	0.	0.	0.	0.	0.	0.
38.0	386.	885.	60349.	80018.	0.	0.	0.	0.	0.	0.
39.0	0.	3835.	104521.	106200.	0.	0.	0.	0.	0.	0.
40.0	1769.	11971.	95308.	127208.	0.	0.	0.	0.	0.	0.
41.0	5154.	50732.	98420.	88949.	0.	0.	0.	0.	0.	0.
42.0	15273.	72833.	102137.	70992.	0.	0.	0.	0.	0.	0.
43.0	22702.	120159.	97579.	60231.	0.	0.	0.	0.	0.	0.
44.0	39266.	134497.	118383.	31282.	0.	0.	0.	0.	0.	0.
45.0	54061.	118619.	113594.	27058.	0.	0.	0.	0.	0.	0.
46.0	40120.	103067.	99166.	19403.	0.	0.	0.	0.	0.	0.
47.0	18195.	79920.	99266.	22388.	0.	0.	0.	0.	0.	0.
48.0	10357.	45847.	58157.	15390.	0.	0.	0.	0.	0.	0.
49.0	5899.	36653.	53245.	10826.	0.	0.	0.	0.	0.	0.
50.0	4730.	17579.	21673.	14104.	0.	0.	0.	0.	0.	0.
51.0	4900.	14533.	17134.	9348.	0.	0.	0.	0.	0.	0.
52.0	1615.	5924.	15397.	8074.	0.	0.	0.	0.	0.	0.
53.0	1237.	4621.	11818.	6337.	0.	0.	0.	0.	0.	0.
54.0	3309.	2727.	5835.	3962.	0.	0.	0.	0.	0.	0.
55.0	1615.	9851.	0.	9823.	0.	0.	0.	0.	0.	0.
56.0	3403.	2871.	2784.	5360.	0.	0.	0.	0.	0.	0.
57.0	5140.	8904.	1589.	4086.	0.	0.	0.	0.	0.	0.
58.0	1023.	5128.	700.	1883.	0.	0.	0.	0.	0.	0.
59.0	4684.	11077.	3243.	1458.	0.	0.	0.	0.	0.	0.
60.0	1992.	12969.	1985.	1982.	0.	0.	0.	0.	0.	0.
61.0	2019.	2062.	1589.	550.	0.	0.	0.	0.	0.	0.
62.0	0.	0.	700.	0.	0.	0.	0.	0.	0.	0.
63.0	0.	1031.	0.	326.	0.	0.	0.	0.	0.	0.
64.0	0.	885.	9431.	1001.	0.	0.	0.	0.	0.	0.
65.0	0.	885.	1207.	0.	0.	0.	0.	0.	0.	0.
66.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 SKIPJACK	BAITBOAT QUARTER 1
2	1976 SKIPJACK	BAITBOAT QUARTER 2
3	1976 SKIPJACK	BAITBOAT QUARTER 3
4	1976 SKIPJACK	BAITBOAT QUARTER 4
5		
6		
7		
8		
9		
10		

ESTIMATED NUMBERS OF FISH CAUGHT

STRATUM

MIDPOINT LENGTH (CM)	1	2	3	4	5	6	7	8	9	10
70.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	0.	0.	1262.	0.	0.	0.	0.	0.	0.	0.
74.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	0.	0.	1262.	0.	0.	0.	0.	0.	0.	0.
TOTAL	251262.	880794.	1266974.	786685.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	46.2	45.8	43.8	42.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	481.9	1633.5	2060.1	1118.5	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 SKIPJACK	BAITBOAT QUARTER 1
2	1976 SKIPJACK	BAITBOAT QUARTER 2
3	1976 SKIPJACK	BAITBOAT QUARTER 3
4	1976 SKIPJACK	BAITBOAT QUARTER 4
5		
6		
7		
8		
9		
10		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
30.0	1695.	0.05	0.05
31.0	0.	0.00	0.05
32.0	2186.	0.07	0.12
33.0	1474.	0.05	0.17
34.0	6651.	0.21	0.38
35.0	16067.	0.50	0.88
36.0	28461.	0.89	1.77
37.0	74287.	2.33	4.11
38.0	141639.	4.45	8.55
39.0	214556.	6.73	15.29
40.0	236255.	7.42	22.70
41.0	243255.	7.64	30.34
42.0	261234.	8.20	38.54
43.0	300671.	9.44	47.98
44.0	323428.	10.15	58.13
45.0	313332.	9.84	67.97
46.0	261750.	8.22	76.18
47.0	219768.	6.90	83.08
48.0	129752.	4.07	87.15
49.0	106622.	3.35	90.50
50.0	58086.	1.82	92.32
51.0	45922.	1.44	93.77
52.0	31010.	0.97	94.74
53.0	24013.	0.75	95.49
54.0	15833.	0.50	95.99
55.0	21289.	0.67	96.66
56.0	14419.	0.45	97.11
57.0	19719.	0.62	97.73
58.0	8735.	0.27	98.00
59.0	20462.	0.64	98.65
60.0	18920.	0.59	99.24
61.0	6221.	0.20	99.44
62.0	700.	0.02	99.46
63.0	1357.	0.04	99.50
64.0	11316.	0.36	99.86
65.0	2092.	0.07	99.92
66.0	0.	0.00	99.92
67.0	0.	0.00	99.92
68.0	0.	0.00	99.92
69.0	0.	0.00	99.92

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
70.0	0.	0.00	99.92
71.0	0.	0.00	99.92
72.0	0.	0.00	99.92
73.0	1262.	0.04	99.96
74.0	0.	0.00	99.96
75.0	0.	0.00	99.96
76.0	0.	0.00	99.96
77.0	0.	0.00	99.96
78.0	0.	0.00	99.96
79.0	0.	0.00	99.96
80.0	1262.	0.04	100.00
TOTAL	3185715.	100.00	
AVE. LENGTH(CM)	44.090		
WEIGHT (METRIC TONS)	5294.1		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
51.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
54.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	38.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
62.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
64.0	38.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65.0	76.	0.	0.	0.	0.	0.	0.	0.	0.	0.
66.0	50.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	50.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
74.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	25.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
82.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
83.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
84.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
86.0	13.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	633.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	68.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 SKIPJACK	LONGLINE QUARTER 4
2		
3		
4		
5		

STRATUM	SPECIES	TITLE
6		
7		
8		
9		
10		

1976 SKIPJACK EASTERN ATLANTIC FOREIGN FLAGS (FINAL) SOUTHWEST FISHERIES CENTER LA JOLLA, CALIFORNIA

ESTIMATED NUMBERS OF FISH CAUGHT
****
STRATUM

JUNE 15, 1977

MIDPOINT LENGTH (CM)	1	2	3	4	5	6	7	8	9	10
38.0	5111.	0.	0.	0.	0.	0.	0.	0.	0.	0.
39.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40.0	5111.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41.0	5111.	0.	0.	0.	0.	0.	0.	0.	0.	0.
42.0	40889.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	35778.	0.	0.	0.	0.	0.	0.	0.	0.	0.
44.0	15333.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45.0	20445.	0.	0.	0.	0.	0.	0.	0.	0.	0.
46.0	15333.	0.	0.	0.	0.	0.	0.	0.	0.	0.
47.0	15333.	0.	0.	0.	0.	0.	0.	0.	0.	0.
48.0	10222.	0.	0.	0.	0.	0.	0.	0.	0.	0.
49.0	15333.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50.0	15333.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	15333.	0.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	5111.	0.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	10222.	0.	0.	0.	0.	0.	0.	0.	0.	0.
54.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	5111.	0.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	10222.	0.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	5111.	0.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
62.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	5111.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	255553.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	46.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	515.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE	STRATUM	SPECIES	TITLE
1	1976 SKIPJACK	UNKOWN GEARS QUARTER 1	6		
2			7		
3			8		
4			9		
5			10		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
39.0	382.	0.	0.	569.	0.	0.	0.	0.	0.	0.
40.0	0.	148.	0.	0.	0.	0.	0.	0.	0.	0.
41.0	0.	0.	0.	122.	0.	0.	0.	0.	0.	0.
42.0	0.	148.	0.	691.	0.	0.	0.	0.	0.	0.
43.0	0.	148.	0.	1627.	0.	0.	0.	0.	0.	0.
44.0	0.	148.	0.	1829.	0.	0.	0.	0.	0.	0.
45.0	0.	295.	0.	814.	0.	0.	0.	0.	0.	0.
46.0	191.	0.	0.	3781.	0.	0.	0.	0.	0.	0.
47.0	168.	0.	0.	1383.	0.	0.	0.	0.	0.	0.
48.0	1179.	0.	0.	1138.	0.	0.	0.	0.	0.	0.
49.0	865.	0.	0.	822.	0.	0.	0.	0.	0.	0.
50.0	1752.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	1055.	0.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	1437.	0.	0.	830.	0.	0.	0.	0.	0.	0.
53.0	1504.	443.	0.	8.	0.	0.	0.	0.	0.	0.
54.0	741.	738.	29.	497.	0.	0.	0.	0.	0.	0.
55.0	191.	148.	15.	37.	0.	0.	0.	0.	0.	0.
56.0	168.	0.	29.	952.	0.	0.	0.	0.	0.	0.
57.0	0.	0.	0.	8.	0.	0.	0.	0.	0.	0.
58.0	0.	148.	59.	37.	0.	0.	0.	0.	0.	0.
59.0	0.	0.	44.	593.	0.	0.	0.	0.	0.	0.
60.0	0.	148.	29.	138.	0.	0.	0.	0.	0.	0.
61.0	0.	0.	44.	59.	0.	0.	0.	0.	0.	0.
62.0	382.	0.	0.	8.	0.	0.	0.	0.	0.	0.
63.0	0.	0.	44.	59.	0.	0.	0.	0.	0.	0.
64.0	0.	0.	0.	16.	0.	0.	0.	0.	0.	0.
65.0	0.	0.	0.	59.	0.	0.	0.	0.	0.	0.
66.0	0.	0.	0.	85.	0.	0.	0.	0.	0.	0.
67.0	0.	0.	15.	93.	0.	0.	0.	0.	0.	0.
68.0	0.	0.	0.	85.	0.	0.	0.	0.	0.	0.
69.0	0.	0.	0.	59.	0.	0.	0.	0.	0.	0.
70.0	0.	0.	15.	112.	0.	0.	0.	0.	0.	0.
71.0	0.	0.	0.	59.	0.	0.	0.	0.	0.	0.
72.0	0.	0.	0.	83.	0.	0.	0.	0.	0.	0.
73.0	0.	0.	0.	75.	0.	0.	0.	0.	0.	0.
74.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	0.	0.	0.	29.	0.	0.	0.	0.	0.	0.
76.0	0.	0.	15.	0.	0.	0.	0.	0.	0.	0.
77.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 BIGEYE	BAITBOAT QUARTER 1
2	1976 BIGEYE	BAITBOAT QUARTER 2
3	1976 BIGEYE	BAITBOAT QUARTER 3
4	1976 BIGEYE	BAITBOAT QUARTER 4
5		

STRATUM	SPECIES	TITLE
6		
7		
8		
9		
10		

ESTIMATED NUMBERS OF FISH CAUGHT
****

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
79.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
82.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
83.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
84.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
86.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
88.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
89.0	0.	0.	0.	29.	0.	0.	0.	0.	0.	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
92.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
93.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
94.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
96.0	0.	0.	0.	8.	0.	0.	0.	0.	0.	0.
97.0	0.	0.	0.	8.	0.	0.	0.	0.	0.	0.
TOTAL	10015.	2512.	338.	16802.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	50.9	50.6	60.4	48.4	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	27.1	6.8	1.6	40.9	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 BIGEYE	BAITBOAT QUARTER 1
2	1976 BIGEYE	BAITBOAT QUARTER 2
3	1976 BIGEYE	BAITBOAT QUARTER 3
4	1976 BIGEYE	BAITBOAT QUARTER 4
5		
6		
7		
8		
9		
10		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
39.0	951.	3.20	3.20
40.0	148.	0.50	3.70
41.0	122.	0.41	4.11
42.0	839.	2.83	6.94
43.0	1775.	5.98	12.93
44.0	1977.	6.66	19.59
45.0	1109.	3.74	23.33
46.0	3972.	13.39	36.72
47.0	1551.	5.23	41.95
48.0	2317.	7.81	49.76
49.0	1686.	5.68	55.44
50.0	1752.	5.91	61.35
51.0	1055.	3.56	64.90
52.0	2267.	7.64	72.55
53.0	1955.	6.59	79.14
54.0	2006.	6.76	85.90
55.0	390.	1.32	87.21
56.0	1150.	3.88	91.09
57.0	8.	0.03	91.12
58.0	244.	0.82	91.94
59.0	637.	2.15	94.09
60.0	315.	1.06	95.15
61.0	103.	0.35	95.49
62.0	390.	1.31	96.81
63.0	103.	0.35	97.15
64.0	16.	0.05	97.21
65.0	59.	0.20	97.41
66.0	85.	0.29	97.69
67.0	103.	0.36	98.06
68.0	85.	0.29	98.35
69.0	59.	0.20	98.54
70.0	127.	0.43	98.97
71.0	59.	0.20	99.17
72.0	83.	0.28	99.45
73.0	75.	0.25	99.70
74.0	0.	0.00	99.70
75.0	29.	0.10	99.80
76.0	15.	0.05	99.85
77.0	0.	0.00	99.85
78.0	0.	0.00	99.85

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
79.0	0.	0.00	99.85
80.0	0.	0.00	99.85
81.0	0.	0.00	99.85
82.0	0.	0.00	99.85
83.0	0.	0.00	99.85
84.0	0.	0.00	99.85
85.0	0.	0.00	99.85
86.0	0.	0.00	99.85
87.0	0.	0.00	99.85
88.0	0.	0.00	99.85
89.0	29.	0.10	99.95
90.0	0.	0.00	99.95
91.0	0.	0.00	99.95
92.0	0.	0.00	99.95
93.0	0.	0.00	99.95
94.0	0.	0.00	99.95
95.0	0.	0.00	99.95
96.0	8.	0.03	99.97
97.0	8.	0.03	100.00
TOTAL	29067.	100.00	
AVE. LENGTH(CM)	49.568		
WEIGHT (METRIC TONS)	76.3		

ESTIMATED NUMBERS OF FISH CAUGHT
****
STRATUM

MIDPOINT LENGTH (CM)	1	2	3	4	5	6	7	8	9	10
69.0	384.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70.0	256.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	192.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	384.	0.	0.	0.	0.	0.	0.	0.	0.	0.
74.0	2139.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	1178.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76.0	1473.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77.0	4470.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	3317.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	2587.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	4175.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81.0	2139.	0.	0.	0.	0.	0.	0.	0.	0.	0.
82.0	1729.	0.	0.	0.	0.	0.	0.	0.	0.	0.
83.0	2011.	0.	0.	0.	0.	0.	0.	0.	0.	0.
84.0	3125.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	2037.	0.	0.	0.	0.	0.	0.	0.	0.	0.
86.0	3061.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.0	5226.	0.	0.	0.	0.	0.	0.	0.	0.	0.
88.0	3689.	0.	0.	0.	0.	0.	0.	0.	0.	0.
89.0	5692.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	6045.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91.0	3023.	0.	0.	0.	0.	0.	0.	0.	0.	0.
92.0	3945.	0.	0.	0.	0.	0.	0.	0.	0.	0.
93.0	2357.	0.	0.	0.	0.	0.	0.	0.	0.	0.
94.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	2767.	0.	0.	0.	0.	0.	0.	0.	0.	0.
96.0	0.	112.	0.	0.	0.	0.	0.	0.	0.	0.
97.0	0.	223.	0.	0.	0.	0.	0.	0.	0.	0.
98.0	0.	167.	0.	0.	0.	0.	0.	0.	0.	0.
99.0	922.	167.	0.	0.	0.	0.	0.	0.	0.	0.
100.0	0.	223.	0.	0.	0.	0.	0.	0.	0.	0.
101.0	0.	223.	0.	0.	0.	0.	0.	0.	0.	0.
102.0	0.	167.	0.	0.	0.	0.	0.	0.	0.	0.
103.0	0.	391.	0.	0.	0.	0.	0.	0.	0.	0.
104.0	0.	279.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	0.	223.	0.	0.	0.	0.	0.	0.	0.	0.
106.0	0.	56.	0.	0.	0.	0.	0.	0.	0.	0.
107.0	0.	167.	0.	0.	0.	0.	0.	0.	0.	0.
108.0	0.	112.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 ALBACORE	LONGLINE QUARTER 1
2	1976 ALBACORE	LONGLINE QUARTER 3
3		
4		
5		
6		
7		
8		
9		
10		

ESTIMATED NUMBERS OF FISH CAUGHT

STRATUM

MIDPOINT LENGTH (CM)	1	2	3	4	5	6	7	8	9	10
109.0	0.	112.	0.	0.	0.	0.	0.	0.	0.	0.
110.0	0.	56.	0.	0.	0.	0.	0.	0.	0.	0.
111.0	0.	56.	0.	0.	0.	0.	0.	0.	0.	0.
112.0	0.	56.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	68523.	2790.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	85.0	102.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	949.9	71.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 ALBACORE	LONGLINE QUARTER 1
2	1976 ALBACORE	LONGLINE QUARTER 3
3		
4		
5		
6		
7		
8		
9		
10		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
69.0	384.	0.54	0.54
70.0	256.	0.36	0.90
71.0	192.	0.27	1.17
72.0	0.	0.00	1.17
73.0	384.	0.54	1.71
74.0	2139.	3.00	4.71
75.0	1178.	1.65	6.36
76.0	1473.	2.07	8.42
77.0	4470.	6.27	14.69
78.0	3317.	4.65	19.34
79.0	2587.	3.63	22.97
80.0	4175.	5.85	28.83
81.0	2139.	3.00	31.83
82.0	1729.	2.42	34.25
83.0	2011.	2.82	37.07
84.0	3125.	4.38	41.45
85.0	2037.	2.86	44.31
86.0	3061.	4.29	48.60
87.0	5226.	7.33	55.93
88.0	3689.	5.17	61.10
89.0	5892.	8.26	69.36
90.0	6045.	8.48	77.84
91.0	3023.	4.24	82.08
92.0	3945.	5.53	87.61
93.0	2357.	3.30	90.91
94.0	0.	0.00	90.91
95.0	2767.	3.88	94.79
96.0	112.	0.16	94.95
97.0	223.	0.31	95.26
98.0	167.	0.23	95.50
99.0	1090.	1.53	97.03
100.0	223.	0.31	97.34
101.0	223.	0.31	97.65
102.0	167.	0.23	97.89
103.0	391.	0.55	98.43
104.0	279.	0.39	98.83
105.0	223.	0.31	99.14
106.0	56.	0.08	99.22
107.0	167.	0.23	99.45
108.0	112.	0.16	99.61

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
109.0	112.	0.16	99.77
110.5	56.	0.08	99.84
111.5	56.	0.08	99.92
112.0	56.	0.08	100.00
TOTAL	71314.	100.00	
AVE. LENGTH(CM)	85.713		
WEIGHT (METRIC TONS)	1020.8		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
54.0	0.	596.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	1403.	0.	0.	0.	0.	0.	0.	0.	0.	0.
60.0	702.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	0.	319.	0.	0.	0.	0.	0.	0.	0.	0.
62.0	0.	915.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	0.	596.	0.	0.	0.	0.	0.	0.	0.	0.
64.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
66.0	0.	319.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	702.	915.	0.	0.	0.	0.	0.	0.	0.	0.
68.0	1916.	596.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	2105.	639.	0.	0.	0.	0.	0.	0.	0.	0.
70.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	1727.	2149.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	0.	1191.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	512.	1191.	0.	0.	0.	0.	0.	0.	0.	0.
74.0	1214.	1191.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	1214.	319.	0.	0.	0.	0.	0.	0.	0.	0.
76.0	512.	596.	0.	0.	0.	0.	0.	0.	0.	0.
77.0	1916.	958.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	2428.	1510.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	1821.	3340.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	2049.	3660.	0.	0.	0.	0.	0.	0.	0.	0.
81.0	4478.	4255.	0.	0.	0.	0.	0.	0.	0.	0.
82.0	1955.	2425.	0.	0.	0.	0.	0.	0.	0.	0.
83.0	6260.	1916.	0.	0.	0.	0.	0.	0.	0.	0.
84.0	4990.	319.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	5636.	2468.	0.	0.	0.	0.	0.	0.	0.	0.
86.0	4004.	2382.	0.	0.	0.	0.	0.	0.	0.	0.
87.0	1860.	2382.	0.	0.	0.	0.	0.	0.	0.	0.
88.0	5919.	639.	0.	0.	0.	0.	0.	0.	0.	0.
89.0	3302.	319.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	4327.	1830.	0.	0.	0.	0.	0.	0.	0.	0.
91.0	2846.	1191.	0.	0.	0.	0.	0.	0.	0.	0.
92.0	2049.	1234.	0.	0.	0.	0.	0.	0.	0.	0.
93.0	2846.	1234.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 ALBACORE	LONGLINE QUARTER 3
2	1976 ALBACORE	LONGLINE QUARTER 4
3		
4		
5		
6		
7		
8		
9		
10		

ESTIMATED NUMBERS OF FISH CAUGHT

STRATUM

MIDPOINT LENGTH (CM)	1	2	3	4	5	6	7	8	9	10
94.0	2467.	319.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	835.	0.	0.	0.	0.	0.	0.	0.	0.	0.
96.0	512.	0.	0.	0.	0.	0.	0.	0.	0.	0.
97.0	1348.	319.	0.	0.	0.	0.	0.	0.	0.	0.
98.0	1632.	596.	0.	0.	0.	0.	0.	0.	0.	0.
99.0	2333.	915.	0.	0.	0.	0.	0.	0.	0.	0.
100.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101.0	512.	0.	0.	0.	0.	0.	0.	0.	0.	0.
102.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
103.0	418.	0.	0.	0.	0.	0.	0.	0.	0.	0.
104.0	418.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	418.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	81586.	45743.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	84.6	80.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	1132.8	546.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 ALBACORE	LONGLINE QUARTER 3
2	1976 ALBACORE	LONGLINE QUARTER 4
3		
4		
5		
6		
7		
8		
9		
10		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
54.0	596.	0.47	0.47
55.0	0.	0.00	0.47
56.0	0.	0.00	0.47
57.0	0.	0.00	0.47
58.0	0.	0.00	0.47
59.0	1403.	1.10	1.57
60.0	702.	0.55	2.12
61.0	319.	0.25	2.37
62.0	915.	0.72	3.09
63.0	596.	0.47	3.56
64.0	0.	0.00	3.56
65.0	0.	0.00	3.56
66.0	319.	0.25	3.81
67.0	1617.	1.27	5.08
68.0	2511.	1.97	7.05
69.0	2744.	2.15	9.21
70.0	0.	0.00	9.21
71.0	3876.	3.04	12.25
72.0	1191.	0.94	13.19
73.0	1704.	1.34	14.52
74.0	2405.	1.89	16.41
75.0	1534.	1.20	17.62
76.0	1108.	0.87	18.49
77.0	2874.	2.26	20.74
78.0	3939.	3.09	23.84
79.0	5161.	4.05	27.89
80.0	5709.	4.48	32.37
81.0	8733.	6.86	39.23
82.0	4380.	3.44	42.67
83.0	8176.	6.42	49.09
84.0	5309.	4.17	53.26
85.0	8104.	6.36	59.63
86.0	6386.	5.02	64.64
87.0	4242.	3.33	67.97
88.0	6558.	5.15	73.13
89.0	3621.	2.84	75.97
90.0	6157.	4.84	80.80
91.0	4037.	3.17	83.97
92.0	3283.	2.58	86.55
93.0	4080.	3.20	89.76

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
94.0	2786.	2.19	91.95
95.0	835.	0.66	92.60
96.0	512.	0.40	93.00
97.0	1667.	1.31	94.31
98.0	2227.	1.75	96.06
99.0	3248.	2.55	98.61
100.0	0.	0.00	98.61
101.0	512.	0.40	99.02
102.0	0.	0.00	99.02
103.0	418.	0.33	99.34
104.0	418.	0.33	99.67
105.0	418.	0.33	100.00
TOTAL	127330.	100.00	
AVE. LENGTH(CM)	83.173		
WEIGHT (METRIC TONS)	1679.0		

LIT[illegible] TUN[illegible] EASTE[illegible] ATLA[illegible] FO[illegible]N FL[illegible] (FI[illegible]) SOUTHEAST FISHERIES CENTER LA JOLLA, CALIFORNIA

ESTIMATED NUMBERS OF FISH CAUGHT

JUNE 15, 1977

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
49.0	8.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	7.	0.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	7.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	27.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	22.	0.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	48.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65.0	71.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	93.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	35.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	22.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	44.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	34.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77.0	28.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	7.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81.0	15.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	468.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	67.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 LITTLE TUNNY	BAITBOAT QUARTER 3
2		
3		
4		
5		

STRATUM	SPECIES	TITLE
6		
7		
8		
9		
10		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
49.0	8.	1.70	1.70
51.0	0.	0.00	1.70
53.0	0.	0.00	1.70
55.0	7.	1.46	3.16
57.0	7.	1.46	4.62
59.0	27.	5.85	10.47
61.0	22.	4.62	15.09
63.0	48.	10.23	25.32
65.0	71.	15.09	40.41
67.0	93.	19.94	60.35
69.0	35.	7.54	67.89
71.0	22.	4.62	72.51
73.0	44.	9.48	81.99
75.0	34.	7.31	89.30
77.0	28.	6.08	95.38
79.0	7.	1.46	96.84
81.0	15.	3.16	100.00
TOTAL	468.	100.00	
AVE. LENGTH(CM)	67.632		
WEIGHT (METRIC TONS)	2.5		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
31.0	9.	0.	0.	0.	0.	0.	0.	0.	0.	0.
32.0	37.	0.	0.	0.	0.	0.	0.	0.	0.	0.
33.0	37.	0.	0.	0.	0.	0.	0.	0.	0.	0.
34.0	64.	0.	0.	0.	0.	0.	0.	0.	0.	0.
35.0	156.	0.	0.	0.	0.	0.	0.	0.	0.	0.
36.0	64.	0.	0.	0.	0.	0.	0.	0.	0.	0.
37.0	46.	0.	0.	0.	0.	0.	0.	0.	0.	0.
38.0	9.	0.	0.	0.	0.	0.	0.	0.	0.	0.
39.0	9.	0.	0.	0.	0.	0.	0.	0.	0.	0.
40.0	9.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41.0	9.	0.	0.	0.	0.	0.	0.	0.	0.	0.
42.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	9.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	458.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	35.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
1	1976 AUXIS	BAITBOAT QUARTER 3
2		
3		
4		
5		
6		
7		
8		
9		
10		

APPENDIX XI

in the original document there is a break in numbering system. It jumped from p.35 to p.78. The numbering system is inconsistent from this point forward with many pages unnumbered.

PRODUCTION OF C/E REPORTS

Program: EFFORT

Language: Fortran

Programmer: Al Good

Data: IATTC data from logbooks

Purpose:

The program is used by the Tuna Commission (IATTC) to process catch and effort data obtained from logbook information. Effort is entered in days and is standardized. Catch is in short tons and is prorated to take care of the cases in which yellowfin and skipjack are mixed. Reports 1-8 are produced. The program was modified to generate a report 9 which punches and lists cards used to process the ICCAT package.

Input:

Cards of catch and effort of yellowfin and skipjack tuna from the Atlantic ocean. The cards must include catches from American, Panamanian and Dutch flag seiners which operated in the Atlantic. The cards are supplied by Craig Orange, IATTC.

Output:

Reports 1-8 are generated by outputing to scratch tapes. Reports on catch and effort are:

1. By class, quarter and one degree area (IATTC, Figure 1)
2. By class and one degree area
3. By class quarter and five degree area
4. By class and five degree area
5. By class, month, and five degree area

6. Cumulative five degree area by month

7. By month and cumulative month

8. By month and one degree area

These reports are returned to Craig Orange along with his cards. An extra copy of report 8 is retained along with the punched cards and listing (report 9) to be used in the catch and effort analysis. Note that these cards have only yellowfin and skipjack on them. The other species must be obtained before running the final report in July, from Craig Orange, IATTC.

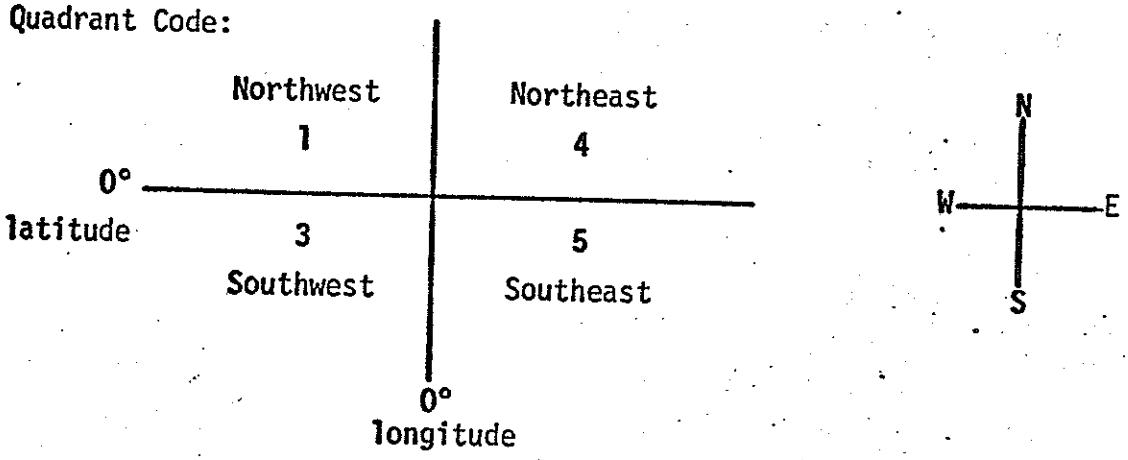
Identification of IATTC Area Codes

Five Degree Code

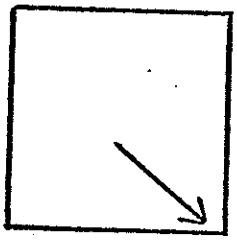
IATTC Code: X XX XXX XX

- X — Quadrant Code
- XX — Latitude
- XXX — Longitude
- XX — One Degree Code

Quadrant Code:



Five Degree Code:



The five degree square code is the coordinates in latitude and longitude of the lower right corner of the five degree square.

One Degree Code:

25	24	23	22	21
20	19	18	17	16
15	14	13	12	11
10	9	8	7	6
5	4	3	2	1

The one degree square code is a number 1-25 in the order shown. If the one degree square is unknown the code is 99.

Program: CATCON

Language: Fortran

Programmer: A.L. Coan, Jr.

Data: IATTC coded one degree cards from program EFFORT

Purpose:

The program uses catch and effort cards from the IATTC and converts IATTC Areas (Figure 1) to ICCAT areas (Figure 2). Areas in which the one degree square is unknown, IATTC code 99, are coded as five degree squares in ICCAT codes. Output from this program is used in program SORT.

Input:

One degree catch and effort cards from program EFFORT (Table 1).

[Note: Change File card so that the parameter 'AREA' is large enough for the input deck (the file is set for 1200 cards or less)]

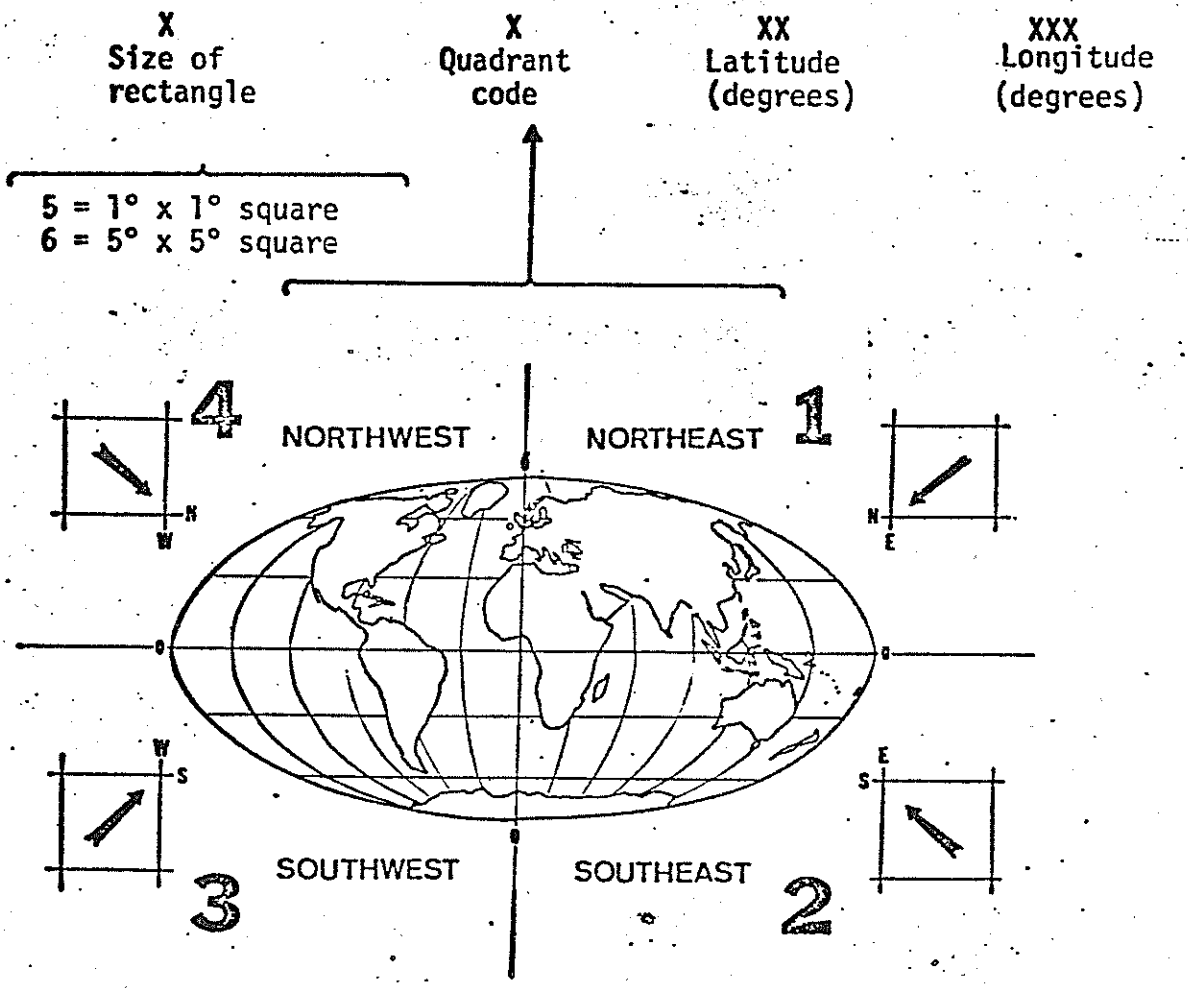
Output:

1. A card deck of one degree catch and effort in ICCAT codes (Table 1)
2. Listing of the card deck
3. A disk file of the above card deck called TEMPO

Figure 2: FISHING AREA CODE USED BY ICCAT

The International Commission for the Conservation of Atlantic Tunas (ICCAT) adopted a coding system for reporting fishing area. The code consists of 7 digits.

Seven digit fishing area code:



The first digit is a code that represents the size of the rectancle, e.g., 5 = 1° x 1° square and 6 = 5° x 5° square, in which the area is located. The second digit indicates the quadrant of the globe in which the fishing area is located. The third and fourth digits represent latitude in degrees, and the fifth to seventh digits represent longitude in degrees. For example, a 5-2-01-005 area is a 1° x 1° square found in the southeast quadrant and bound by 1° and 2° latitude and 5° and 6° longitude.

Table 1:

Atlantic ~~Bluefin~~ Tuna - CARD FORMAT

ONE DEGREE ATLANTIC DATA 67 - 72

Columns	Format	IATTC CARDS	Col.	ICCAT Cards
1-2	I2	Month	1-2	Month
3-4	I2	Year	3-4	Year
5	I1	Quadrant	5	Kind of square
6-7	I2	Latitude	6	Quadrant
8-10	I3	Longitude	7-8	Latitude
11-12	I2	1° Square	9-11	Longitude
13	I1	Class	12	
14-18	F5.0	Effort	13-17	
19-25	F7.0	Yellowfin	18-24	
26-32	F7.0	Skipjack	25-31	
33-39	F7.0	Bluefin	32-38	
40-46	F7.0	Bigeye	39-45	
47-53	F7.0	Black S. J.	46-52	
54-60	F7.0	Albacore	53-59	
61-67	F7.0	Auxis	60-66	
68-74	F7.0	(Other) Unknown	67-73	
		Week Code	74-76	
		Vessel Code	77-79	

Vessel	Codes	
		62-68
A	101	1-9
B	102	
C	103	
D	104	
E	105	
F	106	
G	107	

Atlantic Bluefin Tuna - SIZE CODE

	CM	LB
Large 1	< 185	< 269 +
Medium 2	123 - 184	81 - 265
Small blank (or no indication)	0 - 122	0 - 80
Mixed Small & Medium - 3		
Mixed Medium & Large - 4		

Atlantic Bluefin Tuna - WEEK CODES

Week Number	From	To
1	Apr. 30	May 6
2	May 7	May 13
3	May 14	May 20
4	May 21	May 27
5	May 28	June 3
6	June 4	June 10
7	June 11	June 17
8	June 18	June 24
9	June 25	July 1
10	July 2	July 8
11	July 9	July 15
12	July 16	July 22
13	July 23	July 29
14	July 30	Aug. 5
15	Aug. 6	Aug. 12
16	Aug. 13	Aug. 19
17	Aug. 20	Aug. 26
18	Aug. 27	Sept. 2
19	Sept. 3	Sept. 9
20	Sept. 10	Sept. 16
21	Sept. 17	Sept. 23
22	Sept. 24	Sept. 30
23	Oct. 1	Oct. 7
24	Oct. 8	Oct. 14
25	Oct. 15	Oct. 21
26	Oct. 22	Oct. 28
27	Oct. 29	Nov. 4
28	Nov. 5	Nov. 11
29	Nov. 12	Nov. 18
30	Nov. 19	Nov. 25
31	Nov. 26	Dec. 2

Program: SORT

Language: Algol

Programmer: Nancy Wiley

Data: Disk file TEMPO

Purpose:

The program sorts the disk file (TEMPO) created by CATCON. The sort is by year, class, month, quadrant, latitude and longitude. The output is used for one degree, five degree and ICCAT yellowfin area reports.

Input:

The disk file named TEMPO generated by program CATCON.

Output:

The disk file named CYCLO with the same attributes as disk file TEMPO only sorted as described above. Note that the 'AREA' attribute must be changed for file CYCLO if TEMPO was altered in program CATCON.

Program: DEG5

Language: Fortran

Programmer: A.L.Coan, Jr.

Data: Disk file CYCLO

Purpose:

The program produces a 5-degree summary, a month-NMFS area summary, a monthly summary and a yearly summary for catch and effort of yellowfin, skipjack, bluefin, and bigeye tunas. The summaries are generated for each year, vessel, class, and major ocean area. These reports are part of the ICCAT package.

Input:

Disk: The sorted file CYCLO is used as input to the program. The file card is already included.

Card: 1. Control card

Column	Description
1-2	determines the major ocean areas as: 0 - Total Atlantic 1 - Eastern Atlantic 2 - North Western Atlantic 3 - Mid Western Atlantic 4 - South Western Atlantic 5 - Gulf of Mexico
3-20	date of run
21-80	title (ocean area, etc.)

[Repeat card 1 for all areas needed]

Output: (Figures 3-5)

The first table is a five degree summary by month and NMFS area of catch and effort of yellowfin, skipjack, bluefin, and bigeye tunas. The second table is a month-NMFS area summary and the third is a month summary with a total for the year. Catch is in metric tons and effort is in days fishing.

figure 3

ure 3: CATCH-EFFORT STATISTICS--BY MONTH,5-DEGREE AREA FEBRUARY 25, 1975 PAGE 1

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1974
EASTERN ATL. PRELIMINARY (LOGBOOK COVERAGE IN TRIPS IS 73%)
CLASS= 6

FIVE DEGREE

MONTH	ICCAT AREA	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1	6-1- 0- 5	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	6-2- 0- 5	51	5.00	96.16	19.232	0.00	0.000	0.00	0.000	0.00	0.000
1	6-2- 5- 5	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	6-2- 5- 10	52	3.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	6-2-10- 10	52	9.00	3.63	0.403	43.54	4.838	0.00	0.000	0.00	0.000
1	6-2-15- 10	52	5.00	6.35	1.270	81.65	16.329	0.00	0.000	0.00	0.000
2	6-1- 0- 0	51	2.00	1.81	0.907	0.00	0.000	0.00	0.000	0.00	0.000
2	6-1- 0- 5	51	1.00	0.00	0.000	6.35	6.350	0.00	0.000	0.00	0.000
2	6-2- 0- 5	51	4.00	0.00	0.000	0.91	0.227	0.00	0.000	0.00	0.000
2	6-2- 0- 10	51	2.00	9.07	4.536	0.00	0.000	0.00	0.000	0.00	0.000
2	6-2- 5- 10	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	6-4- 0- 0	51	3.00	0.91	0.302	1.81	0.605	0.00	0.000	0.00	0.000
3	6-1- 0- 5	51	1.00	36.29	36.287	45.36	45.359	0.00	0.000	0.00	0.000
3	6-2- 0- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
3	6-2- 5- 10	52	2.00	2.72	1.361	10.89	5.443	0.00	0.000	0.00	0.000
3	6-2-10- 10	52	3.00	0.00	0.000	6.35	2.117	0.00	0.000	0.00	0.000
3	6-2-15- 10	52	1.00	0.00	0.000	5.44	5.443	0.00	0.000	0.00	0.000
6	6-1- 0- 0	51	3.50	0.00	0.000	9.07	2.592	0.00	0.000	0.00	0.000
6	6-1- 0- 5	51	5.00	49.90	9.979	29.94	5.987	0.00	0.000	0.00	0.000
6	6-2- 0- 5	51	16.50	54.43	3.299	121.56	7.367	0.00	0.000	0.00	0.000
6	6-4- 0- 0	51	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4- 0- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4- 0- 10	53	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4- 0- 15	53	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4- 5- 10	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4- 5- 15	53	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4- 5- 20	53	2.00	0.00	0.000	4.54	2.268	0.00	0.000	0.00	0.000
7	6-1- 0- 0	51	17.00	1.81	0.107	0.00	0.000	0.00	0.000	0.00	0.000
7	6-1- 0- 5	51	6.00	22.23	3.704	13.61	2.268	0.00	0.000	0.00	0.000
7	6-2- 0- 0	51	6.00	36.51	6.084	36.07	6.012	0.00	0.000	0.00	0.000
7	6-2- 0- 5	51	143.00	1136.97	7.951	1110.58	7.766	0.00	0.000	0.00	0.000
7	6-4- 0- 0	51	16.00	215.00	13.438	7.26	0.454	0.00	0.000	0.00	0.000

Figure 4

figure 4

CATCH-EFFORT STATISTICS--BY MONTH, NMFS AREA FEBRUARY 25, 1975 PAGE 5

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1974
EASTERN ATL. PRELIMINARY (LOGBOOK COVERAGE IN TRIPS IS 73%)
CLASS= 6

MONTH	ICCAT AREA	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1		51	6.00	96.16	16.027	0.00	0.000	0.00	0.000	0.00	0.000
1		52	18.00	9.98	0.554	125.19	6.955	0.00	0.000	0.00	0.000
2		51	12.00	11.79	0.983	9.07	0.756	0.00	0.000	0.00	0.000
2		52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
3		51	3.00	36.29	12.096	45.36	15.120	0.00	0.000	0.00	0.000
3		52	6.00	2.72	0.454	22.68	3.780	0.00	0.000	0.00	0.000
6		51	31.00	104.33	3.365	160.57	5.180	0.00	0.000	0.00	0.000
6		53	7.00	0.00	0.000	4.54	0.648	0.00	0.000	0.00	0.000
7		51	194.00	1417.05	7.304	1172.06	6.042	0.00	0.000	0.00	0.000
7		53	11.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8		51	277.00	1531.69	5.530	844.68	3.049	0.00	0.000	0.00	0.000
8		52	86.00	104.44	1.214	417.21	4.851	0.00	0.000	0.00	0.000
9		51	14.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9		52	448.00	39.92	0.089	9840.69	21.966	0.00	0.000	0.00	0.000
9		54	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10		51	80.00	268.44	3.355	177.45	2.218	0.00	0.000	0.00	0.000
10		52	308.00	906.43	2.943	2080.02	6.753	0.00	0.000	0.00	0.000
10		53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11		51	93.00	224.07	2.409	164.20	1.766	0.00	0.000	0.00	0.000
11		52	93.00	273.70	2.943	630.31	6.778	0.00	0.000	0.00	0.000
11		53	21.00	30.39	1.447	42.18	2.009	0.00	0.000	0.00	0.000
12		51	23.00	117.03	5.088	85.28	3.708	0.00	0.000	0.00	0.000
12		52	58.00	29.03	0.501	862.73	14.875	0.00	0.000	0.00	0.000

Figure 5

figure 5

CATCH-EFFORT STATISTICS--MONTHLY & YEARLY TOTALS FEBRUARY 25, 1975 PAGE 6

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1974
EASTERN ATL. PRELIMINARY (LOGBOOK COVERAGE IN TRIPS IS 73%)
CLASS= 6

MONTH	ICCAT AREA	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1			24.00	106.14	4.423	125.19	5.216	0.00	0.000	0.00	0.000
2			14.00	11.79	0.842	9.07	0.648	0.00	0.000	0.00	0.000
3			9.00	39.01	4.334	68.04	7.560	0.00	0.000	0.00	0.000
6			38.00	104.33	2.745	165.11	4.345	0.00	0.000	0.00	0.000
7			205.00	1417.05	6.912	1172.06	5.717	0.00	0.000	0.00	0.000
8			363.00	1636.13	4.507	1261.89	3.476	0.00	0.000	0.00	0.000
9			464.00	39.92	0.086	9840.69	21.208	0.00	0.000	0.00	0.000
10			390.00	1174.87	3.012	2257.47	5.788	0.00	0.000	0.00	0.000
11			207.00	528.16	2.552	836.70	4.042	0.00	0.000	0.00	0.000
12			81.00	146.06	1.803	948.01	11.704	0.00	0.000	0.00	0.000
YEARLY TOTAL			1795.00	5203.45	2.899	16684.21	9.295	0.00	0.000	0.00	0.000

Program: CLASS2

Language: Fortran

Programmer: A.L.Coan, Jr.

Data: Disk file CYCLO

Purpose:

The program produces a one degree summary of catch and effort by month and NMFS area (figure 7) for yellowfin, skipjack, bigeye, and bluefin tunas. Reports are generated for each major ocean area (figure 6), for each year and vessel class. Copies of the output are part of the ICCAT Package.

Input:

Disk: The sorted disk file, CYCLO, is used to input each one degree square. The file card is already in the program.

Card: 1. Control card

Column	Description
1-2	determines the major ocean area as: 0 - Total Atlantic 1 - Eastern Atlantic 2 - North Western Atlantic 3 - Mid Western Atlantic 4 - South Western Atlantic 5 - Gulf of Mexico
3-20	date of run
21-80	title (ocean area, etc.)

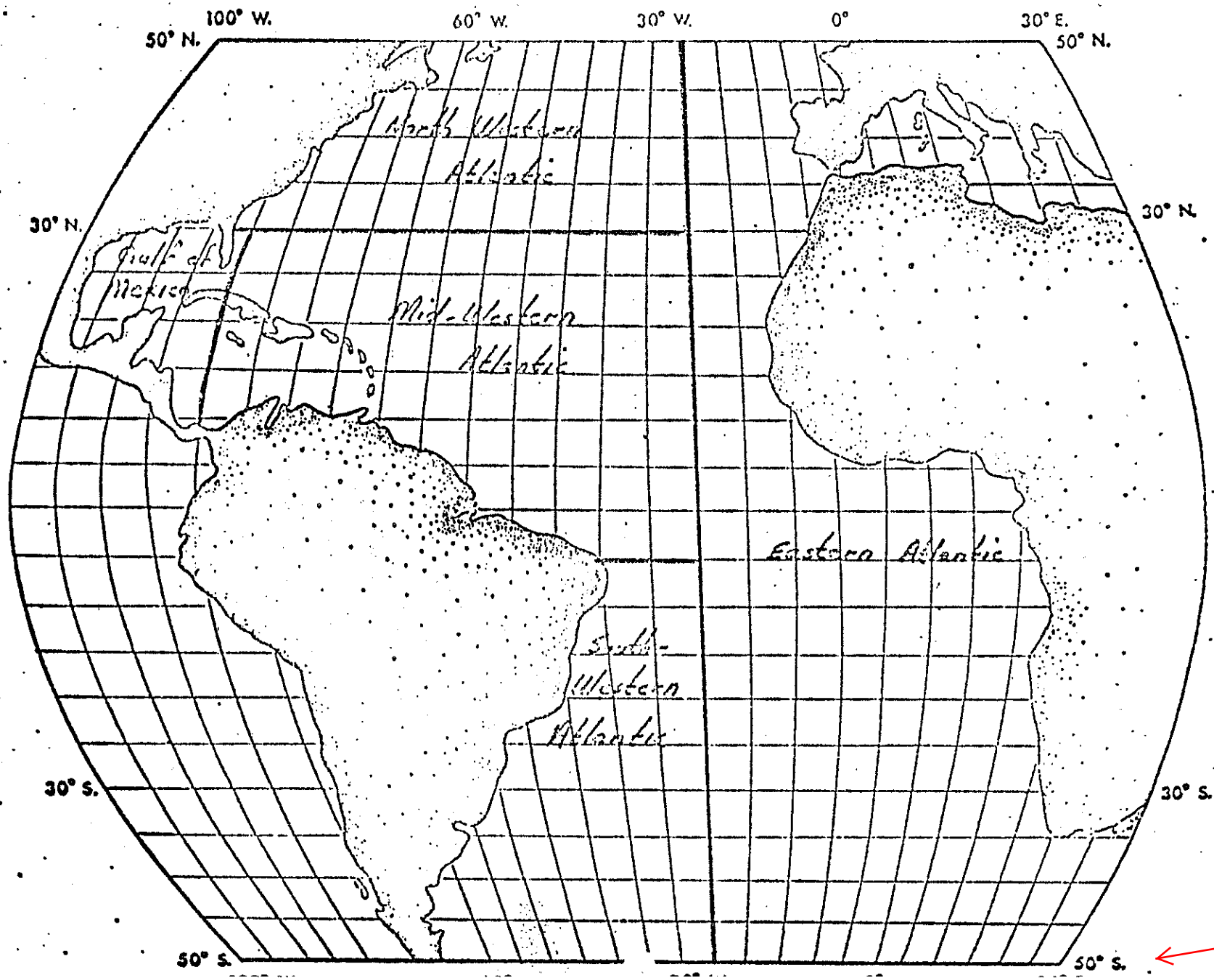
[Repeat card 1 for all areas needed)

Output: (Figure 8)

A table is produced of catch and effort by one degree square and month for yellowfin, skipjack, bluefin and bigeye tunas. The one degree squares are ICCAT coded (figure 2). Effort is in days fishing and catch is in metric tons. Catch per unit effort is also given in metric tons per day fishing.

figure 6

Atlantic Ocean area Divisions



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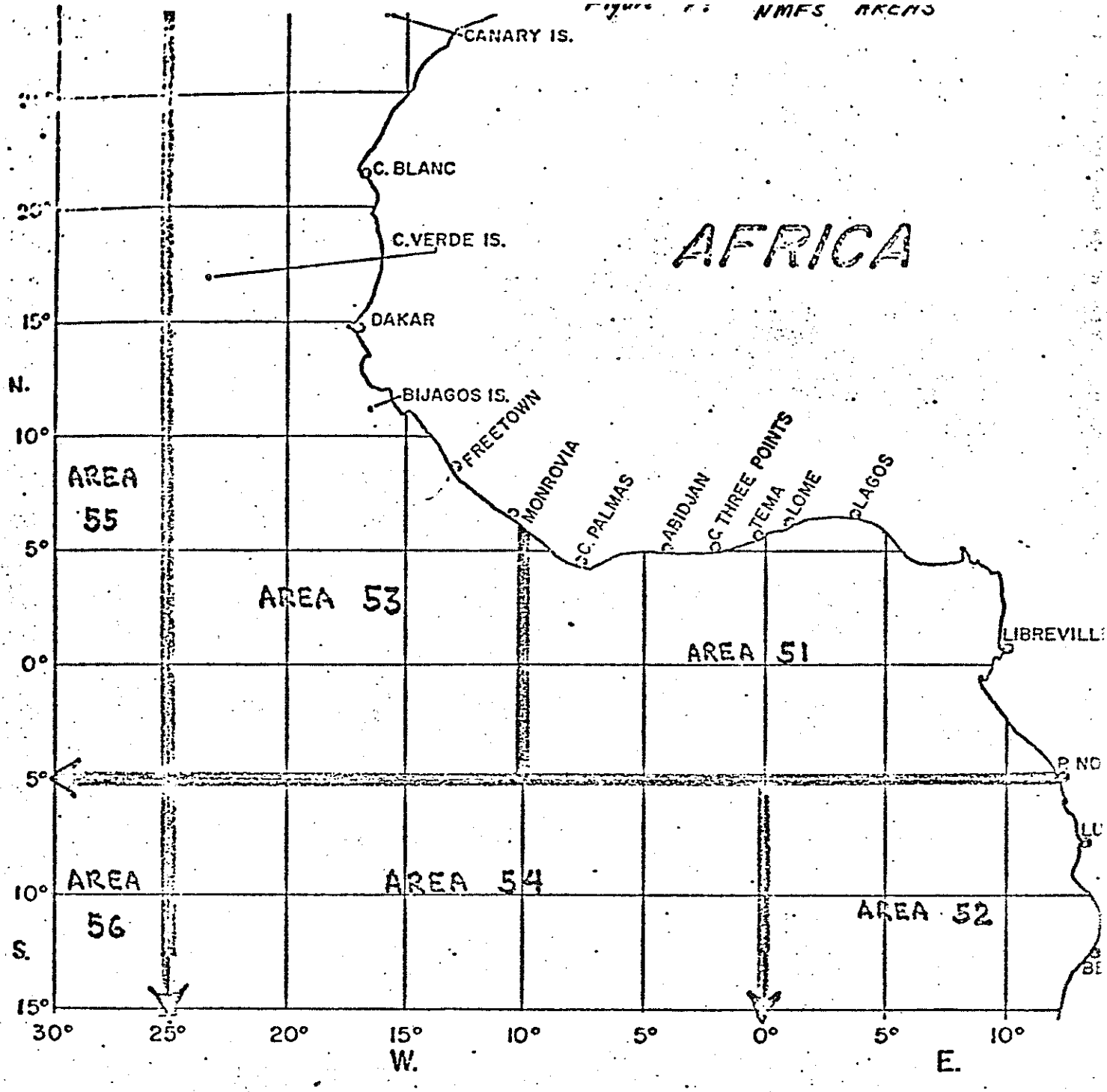


EASTERN TROPICAL ATLANTIC MARKET SAMPLE AREAS (Next areas)

12/71

ure 8:

figure 8

CATCH-EFFORT STATISTICS--BY MONTH,1-DEGREE AREA FEBRUARY 25, 1975 PAGE 1

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1974
EASTERN ATL. PRELIMINARY (LOGBOOK COVERAGE IN TRIPS IS 73%)
CLASS= 6

MONTH	ICCAT AREA	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1	5-1- 0- 7	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2- 1- 5	51	1.50	77.11	51.407	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2- 1- 6	51	2.00	19.05	9.525	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2- 1- 8	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2- 2- 5	51	0.50	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2- 5- 9	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2- 6- 11	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2- 9- 12	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2-10- 13	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2-11- 12	52	1.00	3.63	3.629	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2-12- 12	52	1.00	0.00	0.000	1.81	1.814	0.00	0.000	0.00	0.000
1	5-2-13- 11	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5-2-14- 11	52	3.50	0.00	0.000	37.19	10.627	0.00	0.000	0.00	0.000
1	5-2-14- 12	52	1.50	0.00	0.000	4.54	3.024	0.00	0.000	0.00	0.000
1	5-2-15- 11	52	5.00	6.35	1.270	81.65	16.329	0.00	0.000	0.00	0.000
2	5-1- 0- 3	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	5-1- 1- 5	51	1.00	0.00	0.000	6.35	6.350	0.00	0.000	0.00	0.000
2	5-1- 2- 2	51	1.00	1.81	1.814	0.00	0.000	0.00	0.000	0.00	0.000
2	5-2- 0- 7	51	1.00	0.00	0.000	0.91	0.907	0.00	0.000	0.00	0.000
2	5-2- 0- 8	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	5-2- 1- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	5-2- 3- 11	51	1.00	9.07	9.072	0.00	0.000	0.00	0.000	0.00	0.000
2	5-2- 4- 10	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	5-2- 7- 12	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	5-2- 8- 12	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	5-4- 3- 0	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	5-4- 3- 1	51	1.00	0.91	0.907	1.81	1.814	0.00	0.000	0.00	0.000
2	5-4- 4- 3	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
3	5-1- 0- 5	51	1.00	36.29	36.287	45.36	45.359	0.00	0.000	0.00	0.000
3	5-2- 1- 6	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
3	5-2- 3- 9	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
3	5-2- 6- 10	52	1.00	2.72	2.722	10.89	10.886	0.00	0.000	0.00	0.000
3	5-2- 9- 12	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
3	5-2-10- 12	52	1.00	0.00	0.000	6.35	6.350	0.00	0.000	0.00	0.000
3	5-2-12- 13	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
3	5-2-14- 11	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

Program: ICCAT2

Language: Fortran

Programmer: A.L.Coan,Jr.

Data: Disk file CYCLO

Purpose:

The program generates a summary of catch and effort for yellowfin, skipjack, bluefin and bigeye tunas by ICCAT yellowfin area (figure 9). This report is included in the ICCAT package.

Input:

Disk: The sorted file CYCLO is used to input the one degree square catch and effort. The file card is included in the program.

Card: 1. Control card

Column	Description
1-18	date of run
19-78	title (major area, coverage, etc.)

Output: (figure 10)

1. Summary by month-ICCAT yellowfin area
2. Summary by ICCAT yellowfin area
3. Yearly summary

The catch is in metric tons and effort is in days fishing.

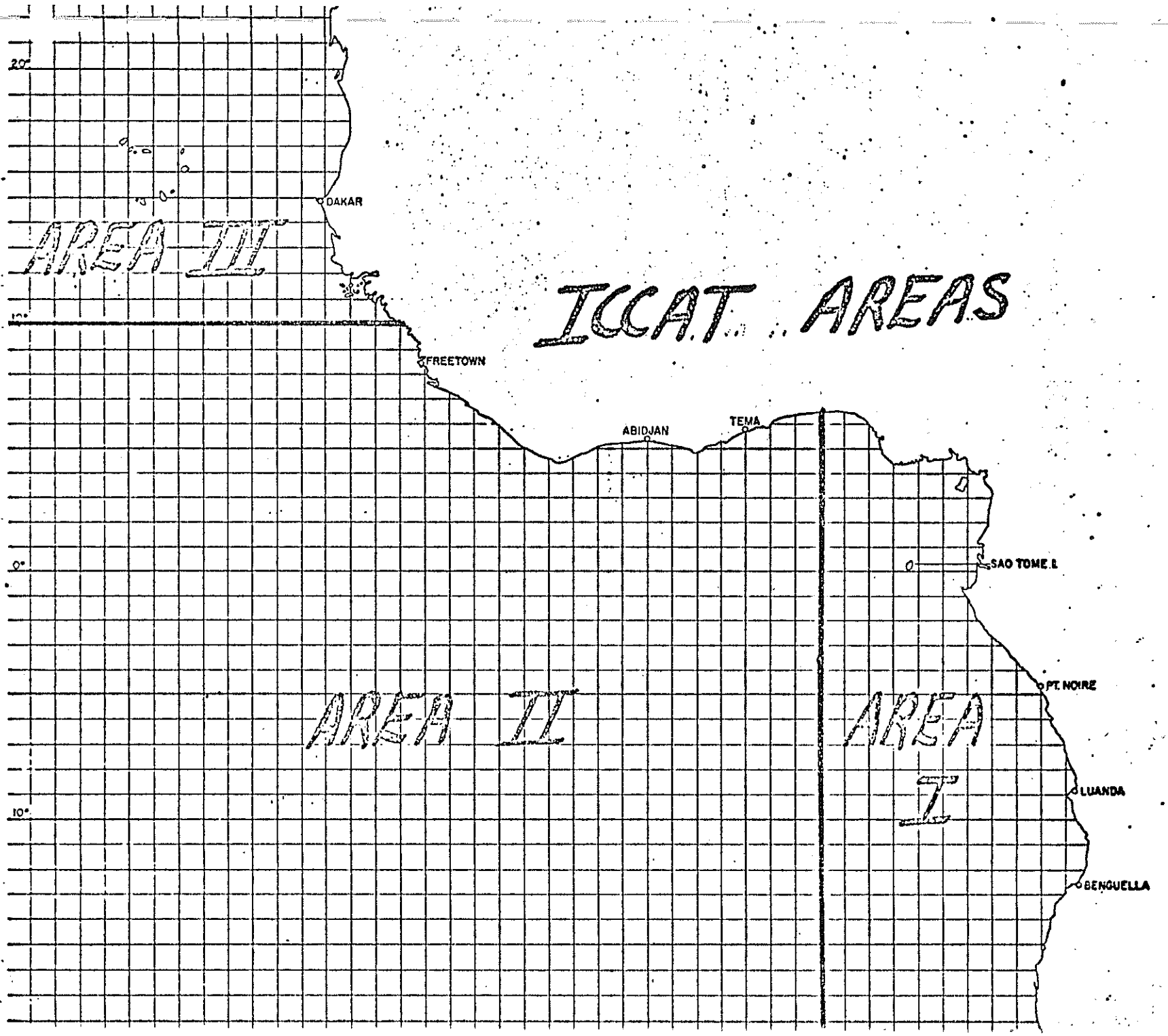


Figure 9. ICCAT YELLOWFIN AREAS

Figure 10:

CATCH-EFFORT STATISTICS--BY MONTH, ICCAT AREA FEBRUARY 25, 1975 PAGE 1

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1974
EASTERN ATL. PRELIMINARY (LOGBOOK COVERAGE IN TRIPS IS 73%)
CLASS= 6

MONTH	ICCAT AREA	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1	1	24.00	106.14	4.423	125.19	5.216	0.00	0.000	0.00	0.000
2	1	10.00	9.07	0.907	7.26	0.726	0.00	0.000	0.00	0.000
2	2	4.00	2.72	0.680	1.81	0.454	0.00	0.000	0.00	0.000
3	1	9.00	39.01	4.334	68.04	7.560	0.00	0.000	0.00	0.000
6	1	23.50	104.33	4.439	151.50	6.447	0.00	0.000	0.00	0.000
6	2	14.50	0.00	0.000	13.61	0.938	0.00	0.000	0.00	0.000
7	1	159.00	1197.51	7.532	1160.26	7.297	0.00	0.000	0.00	0.000
7	2	45.00	219.54	4.879	11.79	0.262	0.00	0.000	0.00	0.000
7	3	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	1	261.00	843.25	3.231	1142.14	4.376	0.00	0.000	0.00	0.000
8	2	102.00	792.88	7.773	119.75	1.174	0.00	0.000	0.00	0.000
9	1	451.00	39.92	0.089	9840.69	21.820	0.00	0.000	0.00	0.000
9	2	13.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	1	383.00	1174.87	3.068	2257.47	5.894	0.00	0.000	0.00	0.000
10	2	7.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	1	124.50	291.84	2.344	646.64	5.194	0.00	0.000	0.00	0.000
11	2	80.50	236.32	2.936	190.06	2.361	0.00	0.000	0.00	0.000
11	3	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
12	1	67.00	107.96	1.611	877.25	13.093	0.00	0.000	0.00	0.000
12	2	14.00	38.10	2.722	70.76	5.054	0.00	0.000	0.00	0.000
TOTAL FOR AREA	1	1512.00	3913.89	2.589	16276.43	10.765	0.00	0.000	0.00	0.000
TOTAL FOR AREA	2	280.00	1289.56	4.606	407.78	1.456	0.00	0.000	0.00	0.000
TOTAL FOR AREA	3	3.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
YEARLY TOTAL		1795.00	5203.45	2.899	16684.21	9.295	0.00	0.000	0.00	0.000

Program: NEW AREAS

Language: Fortran

Programmer: A.L. Coan, Jr.

Data: One-degree catch-effort cards

Purpose:

The program produces a summary of U.S. skipjack tuna catch and effort data from the eastern tropical Atlantic by ICCAT skipjack areas (Figure 11). Three parameters, catch, effort, catch per unit of effort, are output for each quarter and area. Effort is effort on both yellowfin and skipjack tunas. The output from this program is used as part of the ICCAT package.

Input:

Monthly 1-degree catch and effort cards generated by program CATCON. Formats of these cards are described in Table 1 under ICCAT cards.

Output:

One table of catches, efforts, and catch per unit of effort of skipjack tuna is compiled by month and ICCAT skipjack areas (Figure 12). Summaries by quarter and year are also output.

APPENDIX XII

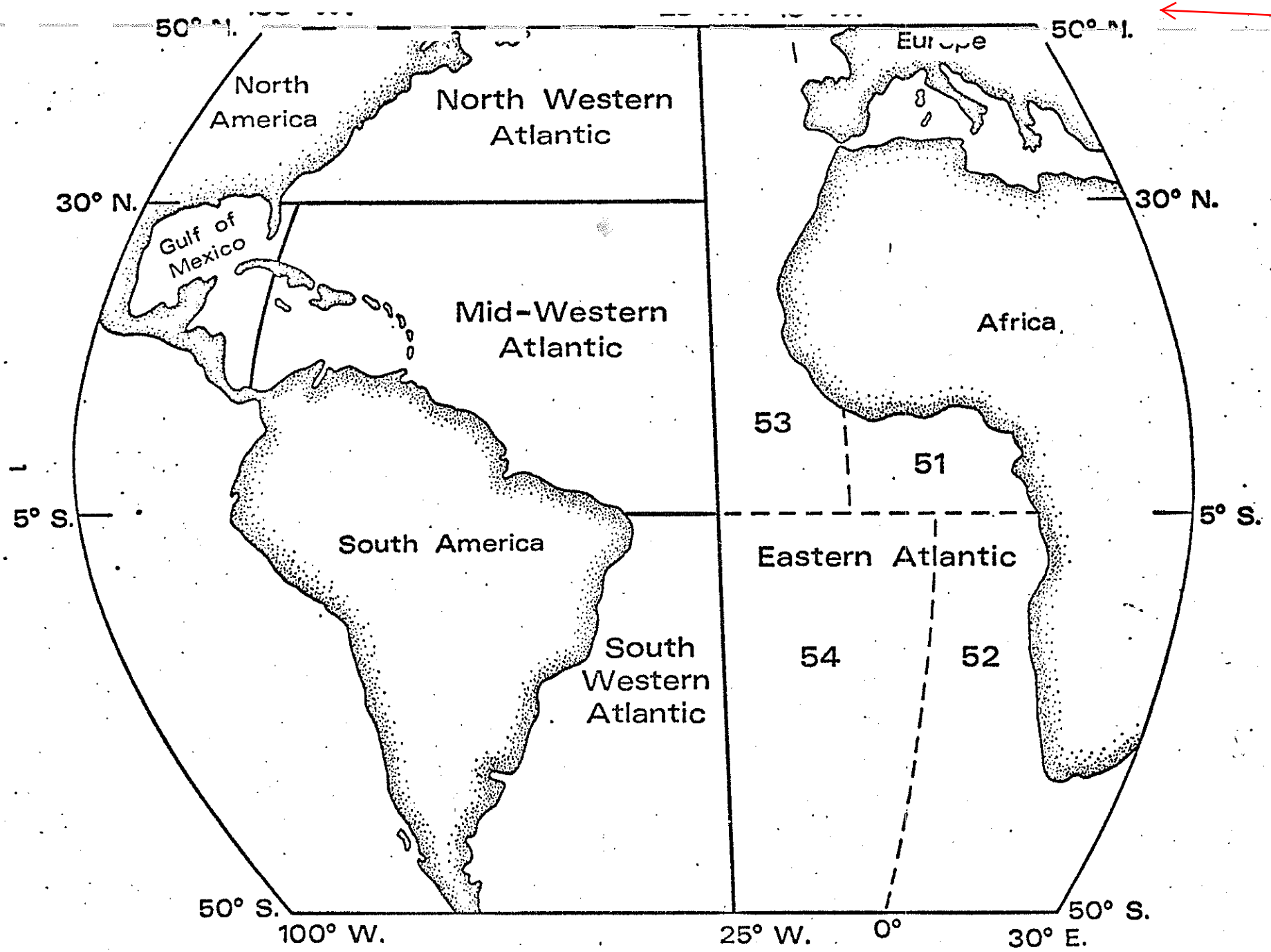
PRODUCTION OF LENGTH-FREQUENCY REPORTS

Report of catch, catch and effort and length-frequency distribution of tunas caught by the American purse seine tuna fleet in the Atlantic in 1976 (Final)

Prepared by

National Marine Fisheries Service
Southwest Fisheries Center
La Jolla, CA 92038

Table of Contents

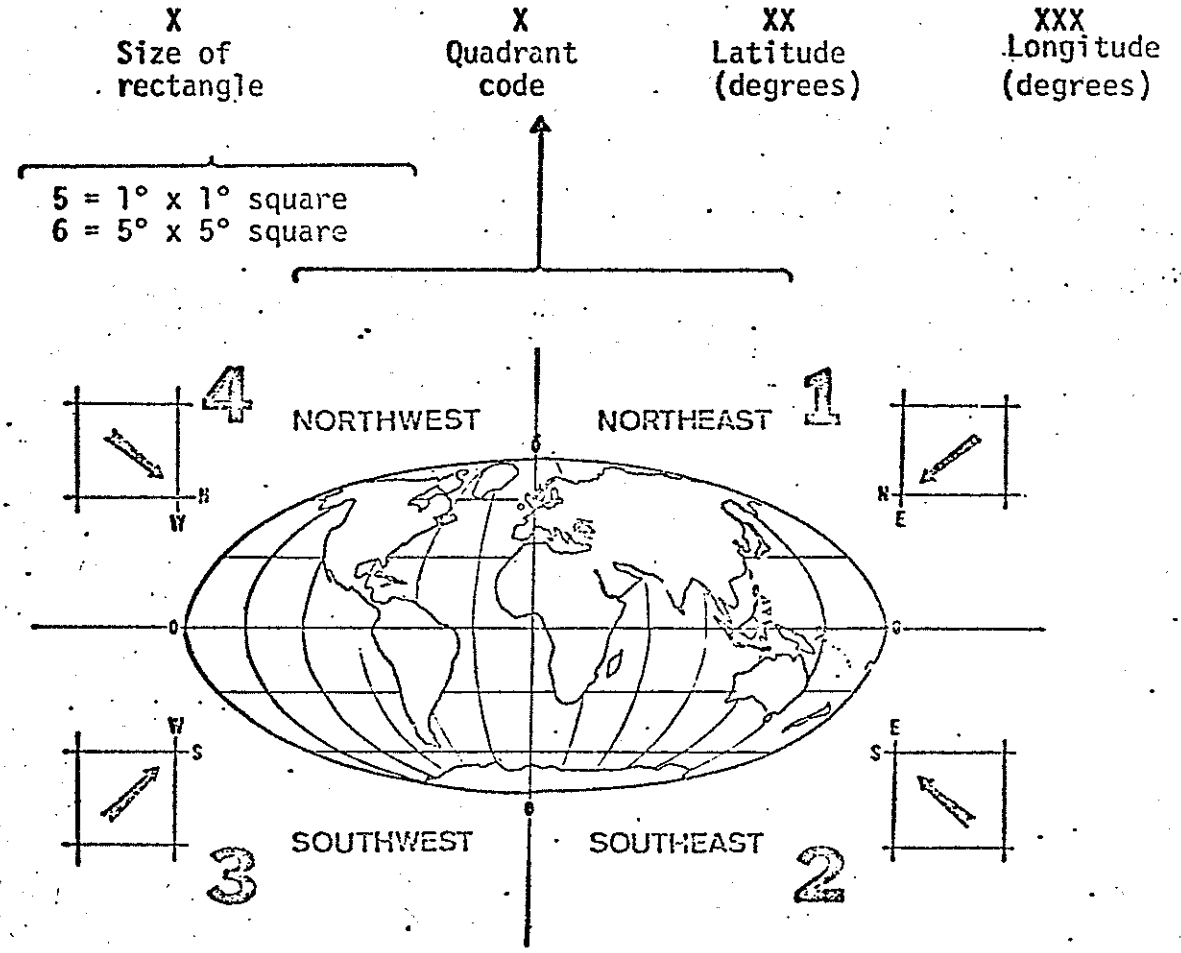


Regions of the Atlantic Ocean used in compiling United States Fishery Statistics on Atlantic Tuna

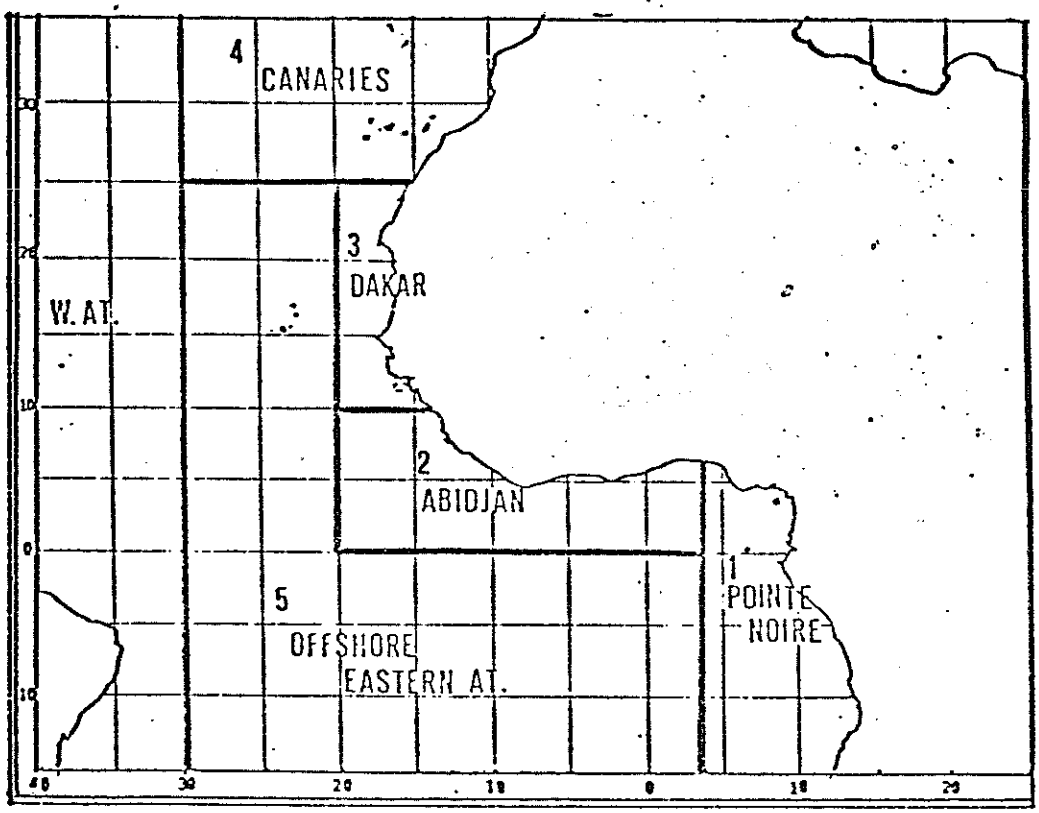
FISHING AREA CODE USED BY ICCAT

The International Commission for the Conservation of Atlantic Tunas (ICCAT) adopted a coding system for reporting fishing area. The code consists of 7 digits.

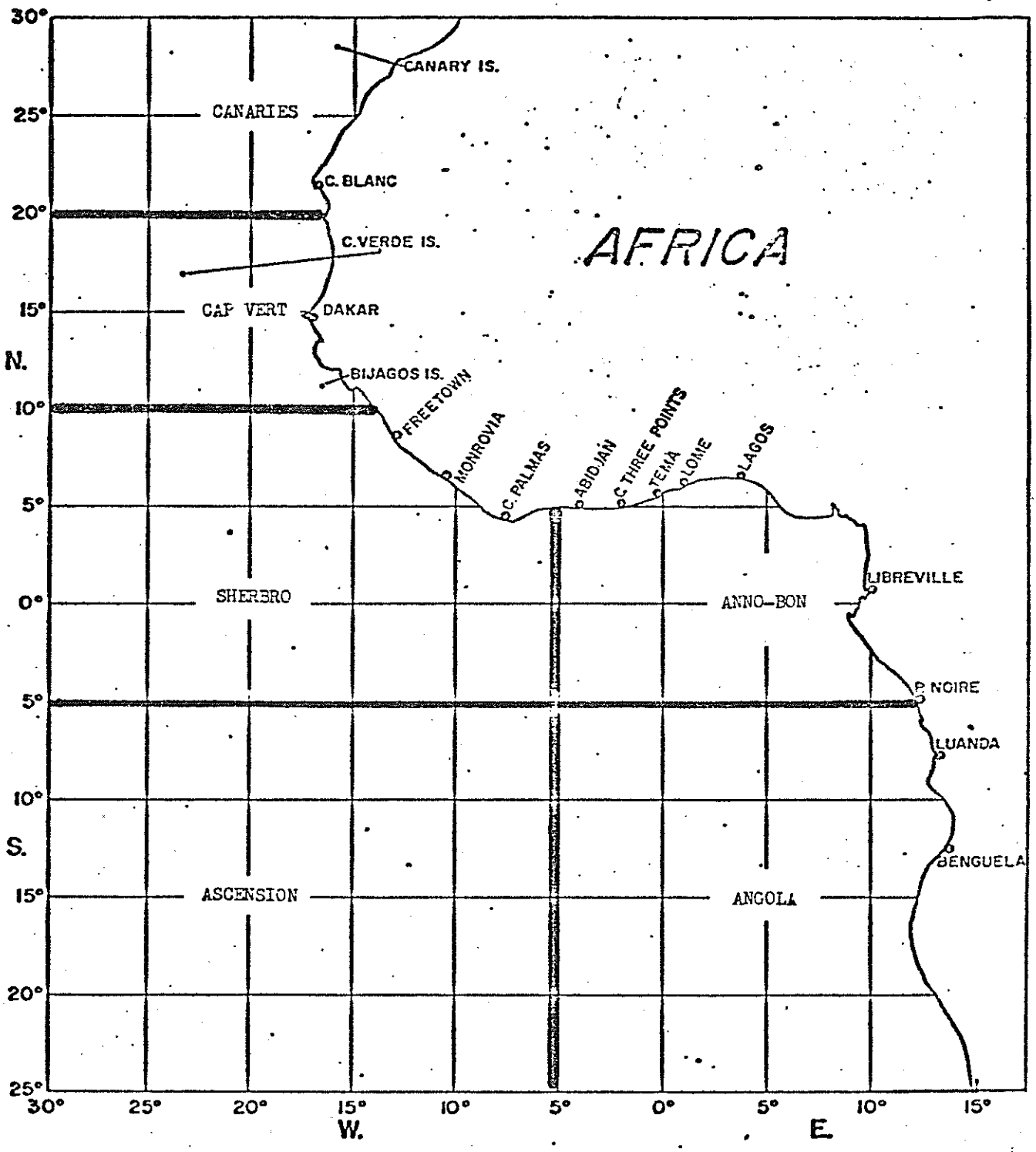
Seven digit fishing area code:



The first digit is a code that represents the size of the rectangle, e.g., 5 = 1° x 1° square and 6 = 5° x 5° square, in which the area is located. The second digit indicates the quadrant of the globe in which the fishing area is located. The third and fourth digits represent latitude in degrees, and the fifth to seventh digits represent longitude in degrees. For example, a 5-2-01-005 area is a 1° x 1° square found in the southeast quadrant and bound by 1° and 2° latitude and 5° and 6° longitude.



ICCAT YELLOWFIN SURFACE FISHERY AREAS



ICCAT SKIPJACK SURFACE FISHERY AREAS

1976 American purse seine catch of tunas from the Atlantic Ocean
(Prepared by the National Marine Fisheries Service,
Southwest Fisheries Center, La Jolla,
CA 92037. June 15, 1977).

Ocean Region	TOTAL CATCH (METRIC TONS) BY SPECIES									
	Yellowfin	Skipjack	Bigeye	Little Tunny	Auxis	Bluefin	Albacore	Other	Total	Number of Vessel
Eastern Atl.	1,706	1,766	28						3,500	7
North-Western Atl.						1,223			1,223	5
Mid-Western Atl.[1]	589	656							1,245	5
Gulf of Mexico										
Total	2,295	2,422	28			1,223			5,968	17

[1]Include some catches by Venezuelan and Bermudian tuna seiners.

SOUTHWEST FISHERIES CENTER LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
EASTERN ATLANTIC

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
8	5-1- 3- 1	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-1- 3- 2	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-1- 3- 4	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 0- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 0- 1	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 0- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 1- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 1- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 3- 9	51	16.00	63.96	3.997	129.73	8.108	0.00	0.000	0.00	0.000
8	5-2- 3- 10	51	15.00	11.34	0.756	256.73	17.116	0.00	0.000	0.00	0.000
8	5-2- 4- 10	51	10.00	2.72	0.272	182.34	18.234	0.00	0.000	0.00	0.000
8	5-2- 4- 11	51	6.00	22.68	3.780	48.08	8.013	0.00	0.000	0.00	0.000
8	5-2- 5- 11	52	1.00	1.81	1.814	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 7- 11	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-2- 7- 12	52	2.00	0.00	0.000	0.91	0.454	0.00	0.000	0.00	0.000
8	5-3- 4- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4- 1- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4- 3- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4- 4- 2	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4- 4- 8	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-1- 1- 0	51	4.00	0.00	0.000	1.81	0.454	0.00	0.000	0.00	0.000
9	5-1- 1- 1	51	2.00	27.22	13.608	47.17	23.587	0.00	0.000	0.00	0.000
9	5-1- 1- 3	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-1- 2- 0	51	6.00	9.07	1.512	0.00	0.000	0.00	0.000	0.00	0.000
9	5-1- 2- 1	51	3.00	0.00	0.000	3.63	1.210	0.00	0.000	0.00	0.000
9	5-1- 3- 0	51	16.00	124.28	7.768	62.60	3.912	0.00	0.000	0.00	0.000
9	5-1- 3- 1	51	30.00	149.69	4.990	182.80	6.093	0.00	0.000	0.00	0.000
9	5-2- 0- 7	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 0- 8	51	2.00	0.00	0.000	3.63	1.814	0.00	0.000	0.00	0.000
9	5-2- 1- 4	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 1- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 1- 6	51	2.00	4.54	2.268	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 2- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 3- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 3- 9	51	2.00	2.10	1.048	4.25	2.127	0.00	0.000	0.00	0.000
9	5-2- 4- 9	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 4- 10	51	22.00	69.85	3.175	143.34	6.515	0.00	0.000	0.00	0.000
9	5-2- 4- 11	51	8.00	19.96	2.495	35.38	4.423	0.00	0.000	2.72	0.340

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976

EASTERN ATLANTIC

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
9	5-2- 5- 10	52	15.00	10.97	0.731	116.95	7.796	0.00	0.000	0.00	0.000
9	5-2- 5- 11	52	1.00	0.91	0.907	2.72	2.722	0.00	0.000	0.00	0.000
9	5-2- 6- 10	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 7- 9	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 7- 12	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 8- 12	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2- 9- 12	52	3.00	6.35	2.117	7.26	2.419	0.00	0.000	0.00	0.000
9	5-2-10- 12	52	9.00	0.00	0.000	19.96	2.218	0.00	0.000	0.00	0.000
9	5-2-11- 7	52	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-2-13- 11	52	6.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 2- 0	51	2.00	64.41	32.205	61.69	30.844	0.00	0.000	0.00	0.000
9	5-4- 2- 1	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 3- 0	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 3- 2	51	2.00	0.00	0.000	4.54	2.268	0.00	0.000	0.00	0.000
9	5-4- 4- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 5- 10	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 7- 14	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 8- 16	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 0- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 0- 2	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 0- 3	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 0- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 0- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 1- 0	51	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 1- 1	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 1- 4	51	6.00	39.01	6.501	48.08	8.013	0.00	0.000	0.00	0.000
10	5-1- 1- 6	51	2.00	0.00	0.000	7.26	3.629	0.00	0.000	0.00	0.000
10	5-1- 2- 2	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 3- 3	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 3- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 3- 7	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 4- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-1- 6- 4	51	6.00	23.81	3.969	14.29	2.381	0.00	0.000	0.00	0.000
10	5-1- 9- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 0- 4	51	14.00	64.41	4.601	43.54	3.110	0.00	0.000	0.00	0.000
10	5-2- 0- 5	51	17.00	54.43	3.202	13.61	0.800	0.00	0.000	0.00	0.000
10	5-2- 1- 3	51	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 1- 4	51	5.00	1.81	0.363	4.54	0.907	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER (LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1976
EASTERN ATLANTIC

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
10	5-2- 1- 5	51	37.00	414.58	11.205	21.77	0.588	0.00	0.000	0.00	0.000
10	5-2- 1- 6	51	4.00	45.36	11.340	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 2- 3	51	4.00	0.91	0.227	1.81	0.454	0.00	0.000	0.00	0.000
10	5-2- 2- 4	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 2- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 2- 7	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 2- 9	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 3- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 3- 9	51	4.00	0.00	0.000	0.91	0.227	0.00	0.000	0.00	0.000
10	5-2- 4- 5	51	1.00	13.61	13.606	4.54	4.536	0.00	0.000	0.00	0.000
10	5-2- 4- 8	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 4- 9	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 5- 0	52	6.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 5- 2	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 5- 9	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 5-10	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 6-11	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2- 7-12	52	9.00	12.70	1.411	8.16	0.907	0.00	0.000	3.63	0.403
10	5-2- 8-12	52	10.00	5.44	0.544	13.61	1.361	0.00	0.000	54.49	2.449
10	5-2- 9-13	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2-10-12	52	6.00	2.72	0.454	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2-10-13	52	6.00	0.00	0.000	15.42	2.570	0.00	0.000	0.00	0.000
10	5-2-11-11	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2-11-12	52	2.00	0.00	0.000	0.91	0.454	0.00	0.000	0.00	0.000
10	5-2-12-13	52	3.00	0.00	0.000	2.72	0.907	0.00	0.000	0.00	0.000
10	5-2-13-10	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2-13-12	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-2-14-11	52	8.00	0.00	0.000	90.72	11.340	0.00	0.000	0.00	0.000
10	5-2-14-12	52	2.00	0.00	0.000	2.72	1.361	0.00	0.000	0.00	0.000
10	5-3- 0- 4	51	2.00	0.00	0.000	1.81	0.907	0.00	0.000	0.00	0.000
10	5-3- 1- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-3- 3- 9	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-3- 4- 2	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-3- 7-13	54	2.00	0.91	0.454	0.00	0.000	0.00	0.000	0.00	0.000
10	5-3- 7-14	54	4.00	0.91	0.227	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 0- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 1- 3	51	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 2- 4	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 2- 6	51	2.00	12.70	6.350	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 3- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER LA JOLLA, NATIONAL MARINE FISHERIES SERVICE

YEAR 1976
EASTERN ATLANTIC

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
10	5-4- 3- 1	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 3- 3	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 3- 7	51	2.00	0.00	0.000	2.72	1.361	0.00	0.000	0.00	0.000
10	5-4- 3- 8	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 4- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 4- 2	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 4- 3	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	5-4- 5- 3	51	2.00	2.72	1.361	1.81	0.907	0.00	0.000	0.00	0.000
10	5-4- 6- 12	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-1- 1- 6	51	8.00	8.16	1.021	45.36	5.670	0.00	0.000	0.00	0.000
11	5-1- 2- 4	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-1- 2- 5	51	2.00	0.00	0.000	4.54	2.268	0.00	0.000	0.00	0.000
11	5-1- 2- 6	51	2.00	0.00	0.000	2.72	1.361	0.00	0.000	0.00	0.000
11	5-1- 3- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-3- 7- 14	54	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-3- 8- 17	54	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 0- 18	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 1- 7	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 1- 13	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 3- 6	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 3- 11	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 4- 1	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 4- 15	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 5- 20	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1976
EASTERN ATLANTIC

MONTH	FIVE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1	6-1- 0- 0	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	6-2- 0- 0	51	28.00	325.68	11.631	19.96	0.713	0.00	0.000	0.00	0.000
1	6-2- 0- 5	51	7.00	45.36	6.480	22.68	3.240	0.00	0.000	0.00	0.000
1	6-4- 0- 0	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	6-2- 0- 0	51	7.00	9.07	1.296	0.00	0.000	0.00	0.000	0.00	0.000
2	6-2- 0- 5	51	11.00	78.93	7.175	7.26	0.660	0.00	0.000	0.00	0.000
2	6-2- 5- 10	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	6-2-10- 5	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	6-2-10- 10	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
2	6-2-15- 10	52	1.00	0.00	0.000	0.45	0.454	0.00	0.000	0.00	0.000
2	6-4- 0- 0	51	1.00	0.00	0.000	0.30	0.000	0.00	0.000	0.00	0.000
2	6-4- 0- 5	51	2.00	16.33	8.165	0.00	0.000	0.00	0.000	0.00	0.000
2	6-4- 5- 10	53	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-1- 0- 0	51	5.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-1- 0- 5	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-2- 0- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-2- 0- 5	51	11.00	63.96	5.814	129.73	11.793	0.00	0.000	0.00	0.000
8	6-2- 0- 10	51	15.50	36.74	2.370	487.16	31.430	0.00	0.000	0.00	0.000
8	6-2- 5- 10	52	2.50	1.81	0.726	0.91	0.363	0.00	0.000	0.00	0.000
8	6-3- 0- 0	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-4- 0- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-4- 0- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-1- 0- 0	51	31.50	310.26	9.849	298.01	9.461	0.00	0.000	0.00	0.000
9	6-2- 0- 0	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-2- 0- 5	51	8.00	6.63	0.829	7.88	0.985	0.00	0.000	0.00	0.000
9	6-2- 0- 10	51	15.00	89.81	5.987	178.72	11.914	0.00	0.000	2.72	0.181
9	6-2- 5- 5	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-2- 5- 10	52	12.50	18.23	1.458	126.92	10.154	0.00	0.000	0.00	0.000
9	6-2-10- 5	52	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-2-10- 10	52	7.50	0.00	0.000	19.96	2.661	0.00	0.000	0.00	0.000
9	6-4- 0- 0	51	4.50	64.41	14.313	66.22	14.717	0.00	0.000	0.00	0.000
9	6-4- 5- 10	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4- 5- 15	53	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
EASTERN ATLANTIC

MONTH	FIVE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
10	6-1- 0- 0	51	12.00	39.01	3.251	48.03	4.007	0.00	0.000	0.00	0.000
10	6-1- 0- 5	51	5.00	0.00	0.000	7.26	1.451	0.00	0.000	0.00	0.000
10	6-1- 5- 0	51	4.00	23.81	5.953	14.29	3.572	0.00	0.000	0.00	0.000
10	6-2- 0- 0	51	14.50	67.13	4.630	49.90	3.441	0.00	0.000	0.00	0.000
10	6-2- 0- 5	51	37.50	527.98	14.080	40.82	1.089	0.00	0.000	0.00	0.000
10	6-2- 5- 0	52	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	6-2- 5- 5	52	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	6-2- 5- 10	52	12.50	18.14	1.451	21.77	1.742	0.00	0.000	28.12	2.250
10	6-2-10- 10	52	16.50	2.72	0.165	112.49	6.818	0.00	0.000	0.00	0.000
10	6-3- 0- 0	51	2.00	0.00	0.000	1.81	0.907	0.00	0.000	0.00	0.000
10	6-3- 0- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	6-3- 5- 10	54	3.00	1.81	0.605	0.00	0.000	0.00	0.000	0.00	0.000
10	6-4- 0- 0	51	10.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	6-4- 0- 5	51	3.00	12.70	4.234	2.72	0.907	0.00	0.000	0.00	0.000
10	6-4- 5- 0	51	1.00	2.72	2.722	1.81	1.814	0.00	0.000	0.00	0.000
10	6-4- 5- 10	53	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-1- 0- 0	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-1- 0- 5	51	6.00	8.16	1.361	52.62	8.769	0.00	0.000	0.00	0.000
11	6-3- 5- 10	54	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-3- 5- 15	54	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 0- 0	51	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 0- 5	51	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 0- 10	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 0- 15	53	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 5- 20	53	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1976
EASTERN ATLANTIC

MONTH	FIVE DEGREE NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1		37.00	371.04	10.028	42.64	1.152	0.00	0.000	0.00	0.000
2		26.00	104.33	4.013	7.71	0.297	0.00	0.000	0.00	0.000
8		42.00	102.51	2.441	617.79	14.709	0.00	0.000	0.00	0.000
9		86.00	489.34	5.690	697.72	8.113	0.00	0.000	2.72	0.032
10		129.00	696.04	5.396	300.96	2.333	0.00	0.000	28.12	0.218
11		19.00	8.16	0.430	52.62	2.769	0.00	0.000	0.00	0.000
YEARLY TOTAL		339.00	1771.41	5.225	1719.43	5.072	0.00	0.000	30.84	0.091

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SOUTHWEST FISHERIES CENTER (LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
NORTH WESTERN ATLANTIC

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
6	5-4-38- 74	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
7	5-4-38- 74	55	44.00	0.00	0.000	0.00	0.000	71.67	1.629	0.00	0.000
7	5-4-39- 73	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
7	5-4-39- 74	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4-38- 73	55	2.00	0.00	0.000	40.82	20.412	0.00	0.000	0.00	0.000
8	5-4-38- 74	55	6.00	0.00	0.000	0.00	0.000	9.98	1.663	0.00	0.000
8	5-4-39- 72	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4-39- 73	55	14.00	0.00	0.000	72.57	5.184	18.14	1.296	22.68	1.620
8	5-4-39- 74	55	4.00	0.00	0.000	0.00	0.000	9.07	2.268	0.00	0.000
8	5-4-40- 71	55	3.00	0.00	0.000	38.10	12.701	0.00	0.000	0.00	0.000
8	5-4-40- 72	55	7.00	0.00	0.000	54.43	7.776	0.00	0.000	0.00	0.000
8	5-4-41- 66	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-36- 74	55	8.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-36- 75	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-37- 74	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-38- 73	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-38- 74	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-39- 73	55	6.00	0.00	0.000	23.59	3.931	0.00	0.000	0.00	0.000
9	5-4-40- 69	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-40- 70	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-40- 71	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-40- 72	55	8.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1976
NORTH WESTERN ATLANTIC

MONTH	FIVE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
6	6-4-35- 70	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
7	6-4-35- 70	55	25.00	0.00	0.000	0.00	0.000	71.67	2.867	0.00	0.000
8	6-4-35- 70	55	14.00	0.00	0.000	113.40	8.100	37.19	2.657	22.68	1.620
8	6-4-40- 65	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-4-40- 70	55	5.00	0.00	0.000	92.53	18.507	0.00	0.000	0.00	0.000
9	6-4-35- 70	55	12.00	0.00	0.000	23.59	1.966	0.00	0.000	0.00	0.000
9	6-4-35- 75	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4-40- 65	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4-40- 70	55	7.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
NORTH WESTERN ATLANTIC

MONTH	FIVE DEGREE NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
6		1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
7		25.00	0.00	0.000	0.00	0.000	71.67	2.867	0.00	0.000
8		20.00	0.00	0.000	205.93	10.297	37.19	1.860	22.68	1.134
9		21.00	0.00	0.000	23.59	1.123	0.00	0.000	0.00	0.000
YEARLY TOTAL		67.00	0.00	0.000	229.52	3.426	108.86	1.625	22.68	0.339

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
MID WESTERN ATLANTIC

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
3	5-4-11- 66	55	8.00	1.00	0.125	260.91	32.613	0.00	0.000	0.00	0.000
4	5-4-10- 66	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	5-4-10- 67	55	1.00	0.00	0.000	89.99	89.993	0.00	0.000	0.00	0.000
4	5-4-10- 77	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	5-4-11- 64	55	5.00	16.96	3.393	1.00	0.200	0.00	0.000	0.00	0.000
4	5-4-11- 65	55	24.00	135.90	5.662	11.97	0.499	0.00	0.000	0.00	0.000
4	5-4-11- 66	55	23.00	29.94	1.302	28.94	1.258	0.00	0.000	0.00	0.000
4	5-4-11- 67	55	9.00	135.08	15.009	115.03	12.781	0.00	0.000	0.00	0.000
4	5-4-11- 73	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	5-4-11- 74	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	5-4-12- 64	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	5-4-12- 65	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	5-4-12- 66	55	10.00	37.92	3.792	2.00	0.200	0.00	0.000	0.00	0.000
4	5-4-12- 68	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	5-4-12- 70	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
5	5-4-11- 64	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
5	5-4-11- 65	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-11- 78	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-15- 76	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-19- 73	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-22- 78	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4-11- 63	55	2.00	27.22	13.608	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4-11- 64	55	26.00	292.11	11.235	42.64	1.640	0.00	0.000	0.00	0.000
8	5-4-11- 68	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5-4-11- 73	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 5- 27	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 6- 33	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 7- 38	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4- 7- 41	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-10- 58	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1976

MID WESTERN ATLANTIC

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
9	5-4-10- 65	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-11- 60	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-11- 63	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-11- 64	55	8.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-11- 65	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-11- 66	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-11- 67	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-12- 59	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-12- 63	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-12- 64	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-12- 66	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	5-4-15- 62	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 6- 26	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 6- 31	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5-4- 6- 36	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
MID WESTERN ATLANTIC

MONTH	FIVE DEGREE	NOFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
3	6-4-10- 65	55	4.00	1.00	0.249	260.91	65.227	0.00	0.000	0.00	0.000
4	6-4-10- 60	55	3.50	16.96	4.847	1.00	0.285	0.00	0.000	0.00	0.000
4	6-4-10- 65	55	37.50	338.83	9.036	247.93	6.612	0.00	0.000	0.00	0.000
4	6-4-10- 70	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
4	6-4-10- 75	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
5	6-4-10- 60	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
5	6-4-10- 65	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-10- 75	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-15- 70	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-15- 75	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-20- 75	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-4-10- 60	55	14.00	319.33	22.809	42.64	3.046	0.00	0.000	0.00	0.000
8	6-4-10- 65	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	6-4-10- 70	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4- 5- 25	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4- 5- 30	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4- 5- 35	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4- 5- 40	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4-10- 55	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4-10- 60	55	8.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4-10- 65	55	5.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	6-4-15- 60	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 5- 25	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 5- 30	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	6-4- 5- 35	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976

MID WESTERN ATLANTIC

MONTH	FIVE DEGREE NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
3		4.00	1.00	0.249	260.91	65.227	0.00	0.000	0.00	0.000
4		46.00	355.80	7.735	248.93	5.412	0.00	0.000	0.00	0.000
5		2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6		4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8		16.00	319.33	19.958	42.64	2.665	0.00	0.000	0.00	0.000
9		20.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11		3.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
YEARLY TOTAL		95.00	676.12	7.117	552.48	5.816	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER (LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
GULF OF MEXICO

MONTH	ONE DEGREE	NMFS	EFFORT	YELLOWFIN-TUNA CATCH	YELLOWFIN-TUNA CPUE	SKIPJACK-TUNA CATCH	SKIPJACK-TUNA CPUE	BLUEFIN-TUNA CATCH	BLUEFIN-TUNA CPUE	BIGEYE-TUNA CATCH	BIGEYE-TUNA CPUE
6	5-4-17- 81	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-23- 87	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-24- 83	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-26- 90	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-27- 89	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-27- 90	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-27- 91	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-27- 92	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	5-4-28- 88	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1976
GULF OF MEXICO

MONTH	FIVE DEGREE	NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
6	6-4-15- 80	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-20- 80	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-20- 85	55	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-25- 85	55	2.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
6	6-4-25- 90	55	4.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER(LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR-1976
GULF OF MEXICO

MONTH	FIVE DEGREE NMFS	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
6		9.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
YEARLY TOTAL		9.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000

SOUTHWEST FISHERIES CENTER LA JOLLA), NATIONAL MARINE FISHERIES SERVICE

YEAR 1976
EASTERN ATLANTIC (FINAL)
CLASS= 6

MONTH	ICCAT AREA	EFFORT	YELLOWFIN TUNA CATCH	YELLOWFIN TUNA CPUE	SKIPJACK TUNA CATCH	SKIPJACK TUNA CPUE	BLUEFIN TUNA CATCH	BLUEFIN TUNA CPUE	BIGEYE TUNA CATCH	BIGEYE TUNA CPUE
1	1	27.00	325.68	12.062	42.64	1.579	0.00	0.000	0.00	0.000
1	2	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
1	5	9.00	45.36	5.040	0.00	0.000	0.00	0.000	0.00	0.000
2	1	18.00	78.93	4.385	7.71	0.428	0.00	0.000	0.00	0.000
2	2	4.00	16.33	4.082	0.00	0.000	0.00	0.000	0.00	0.000
2	5	4.00	9.07	2.268	0.00	0.000	0.00	0.000	0.00	0.000
8	1	33.00	102.51	3.106	617.79	18.721	0.00	0.000	0.00	0.000
8	2	6.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
8	5	3.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
9	1	48.00	114.67	2.389	333.48	6.948	0.00	0.000	2.72	0.057
9	2	38.00	374.67	9.860	364.23	9.585	0.00	0.000	0.00	0.000
9	5	1.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
10	1	95.00	678.80	7.145	294.61	3.101	0.00	0.000	28.12	0.296
10	2	23.00	15.42	0.671	4.54	0.197	0.00	0.000	0.00	0.000
10	5	11.00	1.81	0.165	1.81	0.165	0.00	0.000	0.00	0.000
11	1	7.00	8.16	1.166	52.62	7.517	0.00	0.000	0.00	0.000
11	2	8.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
11	5	5.00	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
TOTAL FOR AREA	1	228.00	1308.75	5.740	1348.85	5.916	0.00	0.000	30.84	0.135
TOTAL FOR AREA	2	80.00	406.42	5.080	368.77	4.610	0.00	0.000	0.00	0.000
TOTAL FOR AREA	5	33.00	56.25	1.704	1.81	0.055	0.00	0.000	0.00	0.000
YEARLY TOTAL		341.00	1771.41	5.195	1719.43	5.042	0.00	0.000	30.84	0.090

1976 SKIPJACK FROM THE EASTERN TROPICAL ATLANTIC AMERICAN PURSE SEINE FLEET FINAL
(EFFORT WITH YELLOWFIN CATCHES AND NO SKIPJACK CATCHES ARE INCLUDED)

MONTH	CAP VERT CATCH	CAP VERT EFFORT	CAP VERT C/E	SHERBRO CATCH	SHERBRO EFFORT	SHERBRO C/E	ANNO-PON CATCH	ANNO-PON EFFORT	ANNO-PON C/E	ANGOLA CATCH	ANGOLA EFFORT	ANGOLA C/E
1	0.00	0.00	0.000	0.00	0.00	0.000	42.64	37.00	1.152	0.00	0.00	0.000
2	0.00	0.00	0.000	0.00	3.00	0.000	7.26	19.00	0.382	0.45	4.00	0.113
8	0.00	0.00	0.000	0.00	2.00	0.000	616.89	37.50	16.450	0.91	2.50	0.363
9	0.00	0.00	0.000	0.00	4.00	0.000	550.83	60.00	9.181	146.88	23.00	6.386
10	0.00	0.00	0.000	2.72	6.00	0.454	163.97	86.00	1.907	134.26	34.00	3.949
11	0.00	0.00	0.000	0.00	8.00	0.000	52.82	9.00	5.846	0.00	0.00	0.000
QUARTER 1	0.00	0.00	0.000	0.00	3.00	0.000	49.90	56.00	0.891	0.45	4.00	0.113
QUARTER 3	0.00	0.00	0.000	0.00	6.00	0.000	1167.72	97.50	11.977	147.79	25.50	5.796
QUARTER 4	0.00	0.00	0.000	2.72	14.00	0.194	216.59	95.00	2.280	134.26	34.00	3.949
YEARLY TOTL	0.00	0.00	0.000	2.72	23.00	0.118	1434.21	248.50	5.771	282.51	63.50	4.449

MONTH	CANARIES CATCH	CANARIES EFFORT	CANARIES C/E	ASCENSION CATCH	ASCENSION EFFORT
9	0.00	0.00	0.000	0.00	0.00
10	0.00	0.00	0.000	0.00	3.00
11	0.00	0.00	0.000	0.00	3.00
QUARTER 3	0.00	0.00	0.000	0.00	0.00
QUARTER 4	0.00	0.00	0.000	0.00	6.00
YEARLY TOTL	0.00	0.00	0.000	0.00	6.00

Total catch (metric tons) and number of fish measured by ICCAT yellowfin area and month for American tuna seiners that fished in the eastern Atlantic Ocean, 1976.

Species/ month	ICCAT 1			ICCAT 2			ICCAT 5		
		Sampled			Sampled			Sampled	
	Total Catch	# of Samples	# of Fish	Total Catch	# of Samples	# of Fish	Total Catch	# of Samples	# of Fish
Yellowfin									
Jan	313.65						43.68		
Feb	76.02			15.73			8.74		
Aug	98.72	2	77						
Sept	110.44	3	150	360.84					
Oct	653.73	2	100	14.85			1.74		
Nov	7.86								
Total	1260.42			391.42			54.16		
Bigeye									
Sept	2.47								
Oct	25.53	1	50						
Total	28.00								

Total catch (metric tons) and number of fish measured by ICCAT skipjack area and month for American tuna seiners that fished in the eastern Atlantic Ocean, 1976.

Species/ month	SHERBRO			ANNO-BON			ANGOLA		
		Sampled			Sampled			Sampled	
	Total Catch	# of Samples	# of Fish	Total Catch	# of Samples	# of Fish	Total Catch	# of Samples	# of Fish
Skipjack									
Jan				43.75					
Feb				7.51			.46		
Aug				633.54	2	100	.94		
Sept				565.79	2	100	150.85		
Oct	2.83			168.37	3	121	137.90		
Nov				54.06					
Total	2.83			1473.02			290.15		

ESTIMATED NUMBERS OF FISH CAUGHT
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MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
41.0	0.	0.	0.	0.	0.	0.	77.	253.	0.	0.
42.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
44.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
46.0	0.	0.	0.	0.	0.	0.	0.	0.	744.	17.
47.0	0.	0.	0.	0.	0.	0.	0.	0.	2974.	68.
48.0	0.	0.	0.	0.	0.	0.	77.	253.	744.	17.
49.0	0.	0.	0.	0.	0.	0.	0.	0.	744.	17.
50.0	0.	0.	0.	0.	0.	0.	77.	253.	3718.	84.
51.0	0.	0.	0.	0.	0.	0.	0.	0.	1487.	34.
52.0	0.	0.	0.	0.	0.	0.	0.	0.	4462.	101.
53.0	0.	0.	0.	0.	0.	0.	0.	0.	5205.	118.
54.0	0.	0.	0.	0.	0.	0.	77.	253.	3718.	84.
55.0	0.	0.	0.	0.	0.	0.	155.	506.	2231.	51.
56.0	0.	0.	0.	0.	0.	0.	0.	0.	1487.	34.
57.0	0.	0.	0.	0.	0.	0.	155.	506.	1487.	34.
58.0	0.	0.	0.	0.	0.	0.	77.	253.	0.	0.
59.0	0.	0.	0.	0.	0.	0.	387.	1264.	174.	4.
60.0	0.	0.	0.	0.	0.	0.	155.	506.	349.	8.
61.0	0.	0.	0.	0.	0.	0.	542.	1769.	174.	4.
62.0	0.	0.	0.	0.	0.	0.	602.	1966.	0.	0.
63.0	0.	0.	0.	0.	0.	0.	524.	1713.	0.	0.
64.0	0.	0.	0.	0.	0.	0.	309.	1011.	0.	0.
65.0	0.	0.	0.	0.	0.	0.	155.	506.	744.	17.
66.0	0.	0.	0.	0.	0.	0.	0.	0.	744.	17.
67.0	0.	0.	0.	0.	0.	0.	240.	785.	0.	0.
68.0	0.	0.	0.	0.	0.	0.	421.	1374.	1487.	34.
69.0	0.	0.	0.	0.	0.	0.	378.	1234.	744.	17.
70.0	0.	0.	0.	0.	0.	0.	0.	0.	744.	17.
71.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	0.	0.	0.	0.	0.	0.	0.	0.	744.	17.
74.0	0.	0.	0.	0.	0.	0.	77.	253.	0.	0.
75.0	0.	0.	0.	0.	0.	0.	77.	253.	0.	0.
76.0	0.	0.	0.	0.	0.	0.	60.	196.	0.	0.
77.0	0.	0.	0.	0.	0.	0.	0.	0.	744.	17.
78.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	952.	133.	231.	48.	27.	299.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	ICCAT 1 JANUARY
2	1976 YELLOWFIN	ICCAT 5 JANUARY
3	1976 YELLOWFIN	ICCAT 1 FEBRUARY
4	1976 YELLOWFIN	ICCAT 2 FEBRUARY
5	1976 YELLOWFIN	ICCAT 5 FEBRUARY
6	1976 YELLOWFIN	ICCAT 1 AUGUST
7	1976 YELLOWFIN	ICCAT 1 SEPTEMBER
8	1976 YELLOWFIN	ICCAT 2 SEPTEMBER
9	1976 YELLOWFIN	ICCAT 1 OCTOBER
10	1976 YELLOWFIN	ICCAT 2 OCTOBER

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
81.0	1269.	177.	307.	64.	35.	399.	0.	0.	0.	0.
82.0	1903.	265.	461.	95.	53.	599.	27.	89.	0.	0.
83.0	317.	44.	77.	16.	9.	100.	0.	0.	0.	0.
84.0	634.	88.	154.	32.	18.	200.	54.	178.	0.	0.
85.0	952.	133.	231.	48.	27.	299.	0.	0.	0.	0.
86.0	1586.	221.	384.	80.	44.	499.	109.	356.	0.	0.
87.0	952.	133.	231.	48.	27.	299.	115.	374.	0.	0.
88.0	1586.	221.	384.	80.	44.	499.	196.	641.	0.	0.
89.0	1903.	265.	461.	95.	53.	599.	54.	178.	0.	0.
90.0	634.	88.	154.	32.	18.	200.	27.	89.	0.	0.
91.0	317.	44.	77.	16.	9.	100.	54.	178.	0.	0.
92.0	317.	44.	77.	16.	9.	100.	27.	89.	0.	0.
93.0	634.	88.	154.	32.	18.	200.	54.	178.	0.	0.
94.0	317.	44.	77.	16.	9.	100.	54.	178.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	82.	267.	0.	0.
96.0	0.	0.	0.	0.	0.	0.	54.	178.	0.	0.
97.0	634.	88.	154.	32.	18.	200.	54.	178.	0.	0.
98.0	0.	0.	0.	0.	0.	0.	54.	178.	0.	0.
99.0	317.	44.	77.	16.	9.	100.	109.	356.	0.	0.
100.0	634.	88.	154.	32.	18.	200.	109.	356.	0.	0.
101.0	0.	0.	0.	0.	0.	0.	169.	552.	0.	0.
102.0	0.	0.	0.	0.	0.	0.	115.	374.	0.	0.
103.0	0.	0.	0.	0.	0.	0.	202.	660.	0.	0.
104.0	172.	24.	42.	9.	5.	54.	60.	196.	0.	0.
105.0	345.	48.	84.	17.	10.	109.	0.	0.	0.	0.
106.0	862.	120.	209.	43.	24.	271.	240.	785.	0.	0.
107.0	517.	72.	125.	26.	14.	163.	0.	0.	0.	0.
108.0	690.	96.	167.	35.	19.	217.	60.	196.	0.	0.
109.0	1207.	168.	293.	61.	34.	380.	0.	0.	0.	0.
110.0	517.	72.	125.	26.	14.	163.	60.	196.	0.	0.
111.0	345.	48.	84.	17.	10.	109.	240.	785.	0.	0.
112.0	0.	0.	0.	0.	0.	0.	180.	589.	0.	0.
113.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
114.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
116.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
117.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
118.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
119.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
120.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	ICCAT 1 JANUARY
2	1976 YELLOWFIN	ICCAT 5 JANUARY
3	1976 YELLOWFIN	ICCAT 1 FEBRUARY
4	1976 YELLOWFIN	ICCAT 2 FEBRUARY
5	1976 YELLOWFIN	ICCAT 5 FEBRUARY
6	1976 YELLOWFIN	ICCAT 1 AUGUST
7	1976 YELLOWFIN	ICCAT 1 SEPTEMBER
8	1976 YELLOWFIN	ICCAT 2 SEPTEMBER
9	1976 YELLOWFIN	ICCAT 1 OCTOBER
10	1976 YELLOWFIN	ICCAT 2 OCTOBER

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
121.0	0.	0.	0.	0.	0.	0.	232.	758.	0.	0.
122.0	0.	0.	0.	0.	0.	0.	258.	842.	0.	0.
123.0	0.	0.	0.	0.	0.	0.	258.	842.	0.	0.
124.0	0.	0.	0.	0.	0.	0.	300.	982.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	77.	253.	0.	0.
126.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
127.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
128.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
129.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
131.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
132.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
133.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
134.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
136.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
137.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
138.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
139.0	0.	0.	0.	0.	0.	0.	0.	0.	349.	8.
140.0	0.	0.	0.	0.	0.	0.	0.	0.	349.	8.
141.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
142.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
143.0	0.	0.	0.	0.	0.	0.	0.	0.	697.	16.
144.0	0.	0.	0.	0.	0.	0.	0.	0.	349.	8.
145.0	0.	0.	0.	0.	0.	0.	0.	0.	697.	16.
146.0	0.	0.	0.	0.	0.	0.	0.	0.	1267.	29.
147.0	0.	0.	0.	0.	0.	0.	0.	0.	349.	8.
148.0	0.	0.	0.	0.	0.	0.	0.	0.	1092.	25.
149.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
151.0	0.	0.	0.	0.	0.	0.	0.	0.	744.	17.
152.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
153.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
154.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
156.0	0.	0.	0.	0.	0.	0.	0.	0.	697.	16.
157.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
158.0	0.	0.	0.	0.	0.	0.	0.	0.	174.	4.
159.0	0.	0.	0.	0.	0.	0.	0.	0.	872.	20.
TOTAL	20613.	2856.	4974.	1032.	575.	6458.	8306.	27158.	44503.	1014.
AVE. LENGTH(CM)	91.9	91.9	91.9	91.9	91.9	91.9	82.0	82.0	73.4	73.4
WEIGHT (METRIC TONS)	313.7	43.7	76.0	15.7	8.7	98.7	110.4	360.8	653.7	14.9
AVE. AGE(MONTHS)	25.9	25.9	25.9	25.9	25.9	25.9	23.8	23.8	23.2	23.2

STRATUM	SPECIES	TITLE
1	1976 YELLOWFIN	ICCAT 1 JANUARY
2	1976 YELLOWFIN	ICCAT 5 JANUARY
3	1976 YELLOWFIN	ICCAT 1 FEBRUARY
4	1976 YELLOWFIN	ICCAT 2 FEBRUARY
6	1976 YELLOWFIN	ICCAT 1 AUGUST
7	1976 YELLOWFIN	ICCAT 1 SEPTEMBER
8	1976 YELLOWFIN	ICCAT 2 SEPTEMBER
9	1976 YELLOWFIN	ICCAT 1 OCTOBER

ESTIMATED NUMBERS OF FISH CAUGHT

STRATUM

MIDPOINT LENGTH (CM)	11	12	13	14	15	16	17	18	19	20
41.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
42.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
44.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
46.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
47.0	8.	36.	0.	0.	0.	0.	0.	0.	0.	0.
48.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
49.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
50.0	10.	45.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	4.	18.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	12.	54.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	14.	63.	0.	0.	0.	0.	0.	0.	0.	0.
54.0	10.	45.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	6.	27.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	4.	18.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	4.	18.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
60.0	1.	4.	0.	0.	0.	0.	0.	0.	0.	0.
61.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
62.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
63.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
64.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
66.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
67.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68.0	4.	18.	0.	0.	0.	0.	0.	0.	0.	0.
69.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
70.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
71.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
74.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
78.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
11	1976 YELLOWFIN	ICCAT 5 OCTOBER
12	1976 YELLOWFIN	ICCAT 1 NOVEMBER
13		
14		
15		

STRATUM	SPECIES	TITLE
16		
17		
18		
19		
20		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 11	12	13	14	15	16	17	18	19	20
81.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
82.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
83.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
84.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
85.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
86.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
87.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
88.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
89.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
90.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
92.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
93.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
94.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
95.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
96.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
97.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
98.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
99.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
100.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
102.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
103.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
104.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
105.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
106.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
107.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
108.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
109.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
110.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
112.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
113.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
114.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
115.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
116.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
117.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
118.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
119.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
120.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

STRATUM	SPECIES	TITLE
11	1976 YELLOWFIN	ICCAT 5 OCTOBER
12	1976 YELLOWFIN	ICCAT 1 NOVEMBER
13		
14		
15		

STRATUM	SPECIES	TITLE
16		
17		
18		
19		
20		

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 11	12	13	14	15	16	17	18	19	20
121.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
122.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
123.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
124.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
125.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
126.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
127.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
128.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
129.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
131.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
132.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
133.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
134.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
135.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
136.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
137.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
138.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
139.0	1.	4.	0.	0.	0.	0.	0.	0.	0.	0.
140.0	1.	4.	0.	0.	0.	0.	0.	0.	0.	0.
141.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
142.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
143.0	2.	8.	0.	0.	0.	0.	0.	0.	0.	0.
144.0	1.	4.	0.	0.	0.	0.	0.	0.	0.	0.
145.0	2.	8.	0.	0.	0.	0.	0.	0.	0.	0.
146.0	3.	15.	0.	0.	0.	0.	0.	0.	0.	0.
147.0	1.	4.	0.	0.	0.	0.	0.	0.	0.	0.
148.0	3.	13.	0.	0.	0.	0.	0.	0.	0.	0.
149.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
150.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
151.0	2.	9.	0.	0.	0.	0.	0.	0.	0.	0.
152.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
153.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
154.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
155.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
156.0	2.	8.	0.	0.	0.	0.	0.	0.	0.	0.
157.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
158.0	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
159.0	2.	10.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	115.	534.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	73.4	73.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	1.7	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AVE. AGE(MONTHS)	23.2	23.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
11	1976 YELLOWFIN	ICCAT 5 OCTOBER
12	1976 YELLOWFIN	ICCAT 1 NOVEMBER
13		
14		
15 ?		

STRATUM	SPECIES	TITLE
16		
17		
18		
19		
20 ?		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)
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MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
41.0	330.	0.28	0.28
42.0	0.	0.00	0.28
43.0	0.	0.00	0.28
44.0	0.	0.00	0.28
45.0	0.	0.00	0.28
46.0	771.	0.65	0.93
47.0	3086.	2.61	3.55
48.0	1102.	0.93	4.48
49.0	771.	0.65	5.13
50.0	4187.	3.55	8.68
51.0	1543.	1.31	9.99
52.0	4629.	3.92	13.91
53.0	5400.	4.57	18.49
54.0	4187.	3.55	22.03
55.0	2975.	2.52	24.55
56.0	1543.	1.31	25.86
57.0	2203.	1.87	27.73
58.0	330.	0.28	28.01
59.0	1832.	1.55	29.56
60.0	1022.	0.87	30.42
61.0	2492.	2.11	32.53
62.0	2567.	2.18	34.71
63.0	2237.	1.90	36.60
64.0	1321.	1.12	37.72
65.0	1432.	1.21	38.94
66.0	771.	0.65	39.59
67.0	1026.	0.87	40.46
68.0	3338.	2.83	43.29
69.0	2384.	2.02	45.31
70.0	771.	0.65	45.96
71.0	0.	0.00	45.96
72.0	0.	0.00	45.96
73.0	771.	0.65	46.61
74.0	330.	0.28	46.89
75.0	330.	0.28	47.17
76.0	256.	0.22	47.39
77.0	771.	0.65	48.04
78.0	0.	0.00	48.04
79.0	0.	0.00	48.04
80.0	1688.	1.43	49.47

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
81.0	2251.	1.91	51.38
82.0	3493.	2.96	54.34
83.0	563.	0.48	54.82
84.0	1358.	1.15	55.97
85.0	1688.	1.43	57.40
86.0	3279.	2.78	60.18
87.0	2177.	1.84	62.02
88.0	3651.	3.09	65.11
89.0	3609.	3.06	68.17
90.0	1242.	1.05	69.22
91.0	795.	0.67	69.90
92.0	679.	0.58	70.47
93.0	1358.	1.15	71.62
94.0	795.	0.67	72.30
95.0	349.	0.30	72.59
96.0	232.	0.20	72.79
97.0	1358.	1.15	73.94
98.0	232.	0.20	74.14
99.0	1028.	0.87	75.01
100.0	1590.	1.35	76.35
101.0	721.	0.61	76.96
102.0	489.	0.41	77.38
103.0	861.	0.73	78.11
104.0	562.	0.48	78.58
105.0	612.	0.52	79.10
106.0	2556.	2.17	81.27
107.0	918.	0.78	82.05
108.0	1480.	1.25	83.30
109.0	2142.	1.81	85.12
110.0	1174.	0.99	86.11
111.0	1638.	1.39	87.50
112.0	769.	0.65	88.15
113.0	0.	0.00	88.15
114.0	0.	0.00	88.15
115.0	0.	0.00	88.15
116.0	0.	0.00	88.15
117.0	0.	0.00	88.15
118.0	0.	0.00	88.15
119.0	0.	0.00	88.15
120.0	0.	0.00	88.15

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
121.0	990.	0.84	88.99
122.0	1099.	0.93	89.92
123.0	1099.	0.93	90.85
124.0	1282.	1.09	91.94
125.0	330.	0.28	92.22
126.0	0.	0.00	92.22
127.0	0.	0.00	92.22
128.0	0.	0.00	92.22
129.0	0.	0.00	92.22
130.0	0.	0.00	92.22
131.0	0.	0.00	92.22
132.0	0.	0.00	92.22
133.0	181.	0.15	92.37
134.0	0.	0.00	92.37
135.0	181.	0.15	92.52
136.0	181.	0.15	92.68
137.0	0.	0.00	92.68
138.0	181.	0.15	92.83
139.0	362.	0.31	93.14
140.0	362.	0.31	93.44
141.0	181.	0.15	93.60
142.0	181.	0.15	93.75
143.0	723.	0.61	94.36
144.0	362.	0.31	94.67
145.0	723.	0.61	95.28
146.0	1314.	1.11	96.39
147.0	362.	0.31	96.70
148.0	1133.	0.96	97.66
149.0	0.	0.00	97.66
150.0	181.	0.15	97.81
151.0	771.	0.65	98.47
152.0	0.	0.00	98.47
153.0	0.	0.00	98.47
154.0	0.	0.00	98.47
155.0	0.	0.00	98.47
156.0	723.	0.61	99.08
157.0	0.	0.00	99.08
158.0	181.	0.15	99.23
159.0	904.	0.77	100.00
TOTAL	118032.	100.00	
AVE. LENGTH(CM)	81.710		
WEIGHT (METRIC TONS)	1706.0		
AVE. AGE(MONTHS)	24.200		

Estimated numbers of yellowfin tuna by month caught by American tuna purse seiners from the ... ster ... bla...

..76 Y...WFI.. ... 1

MIDPOINT LENGTH (CM)	JAN.	FEB.	AUG.	SEPT.	OCT.	NOV.
41.0	0.	0.	0.	33.	0.	0.
42.0	0.	0.	0.	0.	0.	0.
43.0	0.	0.	0.	0.	0.	0.
44.0	0.	0.	0.	0.	0.	0.
45.0	0.	0.	0.	0.	0.	0.
46.0	0.	0.	0.	0.	763.	9.
47.0	0.	0.	0.	0.	3050.	36.
48.0	0.	0.	0.	330.	763.	9.
49.0	0.	0.	0.	0.	763.	9.
50.0	0.	0.	0.	330.	3812.	45.
51.0	0.	0.	0.	0.	1525.	18.
52.0	0.	0.	0.	0.	4575.	54.
53.0	0.	0.	0.	0.	5337.	63.
54.0	0.	0.	0.	330.	3812.	45.
55.0	0.	0.	0.	661.	2288.	27.
56.0	0.	0.	0.	0.	1525.	18.
57.0	0.	0.	0.	661.	1525.	18.
58.0	0.	0.	0.	330.	0.	0.
59.0	0.	0.	0.	1651.	178.	2.
60.0	0.	0.	0.	661.	358.	4.
61.0	0.	0.	0.	2311.	178.	2.
62.0	0.	0.	0.	2568.	0.	0.
63.0	0.	0.	0.	2237.	0.	0.
64.0	0.	0.	0.	1320.	0.	0.
65.0	0.	0.	0.	661.	763.	9.
66.0	0.	0.	0.	0.	763.	9.
67.0	0.	0.	0.	1025.	0.	0.
68.0	0.	0.	0.	1795.	1525.	18.
69.0	0.	0.	0.	1612.	763.	9.
70.0	0.	0.	0.	0.	763.	9.
71.0	0.	0.	0.	0.	0.	0.
72.0	0.	0.	0.	0.	0.	0.
73.0	0.	0.	0.	0.	763.	9.
74.0	0.	0.	0.	330.	0.	0.
75.0	0.	0.	0.	330.	0.	0.
76.0	0.	0.	0.	256.	0.	0.
77.0	0.	0.	0.	0.	763.	9.
78.0	0.	0.	0.	0.	0.	0.
79.0	0.	0.	0.	0.	0.	0.
80.0	1085.	306.	299.	0.	0.	0.

1976 YELLOWFIN
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MIDPOINT LENGTH (CM)	JAN.	FEB.	AUG.	SEPT.	OCT.	NOV.
81.0	1446.	406.	399.	0.	0.	0.
82.0	2168.	609.	599.	116.	0.	0.
83.0	361.	102.	100.	0.	0.	0.
84.0	722.	204.	200.	232.	0.	0.
85.0	1085.	306.	299.	0.	0.	0.
86.0	1807.	508.	499.	465.	0.	0.
87.0	1085.	306.	299.	489.	0.	0.
88.0	1807.	508.	499.	837.	0.	0.
89.0	2168.	609.	599.	232.	0.	0.
90.0	722.	204.	200.	116.	0.	0.
91.0	361.	102.	100.	232.	0.	0.
92.0	361.	102.	100.	116.	0.	0.
93.0	722.	204.	200.	232.	0.	0.
94.0	361.	102.	100.	232.	0.	0.
95.0	0.	0.	0.	349.	0.	0.
96.0	0.	0.	0.	232.	0.	0.
97.0	722.	204.	200.	232.	0.	0.
98.0	0.	0.	0.	232.	0.	0.
99.0	361.	102.	100.	465.	0.	0.
100.0	722.	204.	200.	465.	0.	0.
101.0	0.	0.	0.	721.	0.	0.
102.0	0.	0.	0.	489.	0.	0.
103.0	0.	0.	0.	872.	0.	0.
104.0	196.	56.	54.	256.	0.	0.
105.0	393.	111.	109.	0.	0.	0.
106.0	982.	276.	271.	1025.	0.	0.
107.0	589.	165.	163.	0.	0.	0.
108.0	786.	221.	217.	256.	0.	0.
109.0	1375.	388.	380.	0.	0.	0.
110.0	589.	165.	163.	256.	0.	0.
111.0	393.	111.	109.	1025.	0.	0.
112.0	0.	0.	0.	769.	0.	0.
113.0	0.	0.	0.	0.	0.	0.
114.0	0.	0.	0.	0.	0.	0.
115.0	0.	0.	0.	0.	0.	0.
116.0	0.	0.	0.	0.	0.	0.
117.0	0.	0.	0.	0.	0.	0.
118.0	0.	0.	0.	0.	0.	0.
119.0	0.	0.	0.	0.	0.	0.
120.0	0.	0.	0.	0.	0.	0.
121.0	0.	0.	0.	990.	0.	0.

MIDPOINT LENGTH (CM)	JAN.	FEB.	AUG.	SEPT.	OCT.	NOV.
122.0	0.	0.	0.	110.	0.	0.
123.0	0.	0.	0.	1100.	0.	0.
124.0	0.	0.	0.	1282.	0.	0.
125.0	0.	0.	0.	330.	0.	0.
126.0	0.	0.	0.	0.	0.	0.
127.0	0.	0.	0.	0.	0.	0.
128.0	0.	0.	0.	0.	0.	0.
129.0	0.	0.	0.	0.	0.	0.
130.0	0.	0.	0.	0.	0.	0.
131.0	0.	0.	0.	0.	0.	0.
132.0	0.	0.	0.	0.	0.	0.
133.0	0.	0.	0.	0.	178.	2.
134.0	0.	0.	0.	0.	0.	0.
135.0	0.	0.	0.	0.	178.	2.
136.0	0.	0.	0.	0.	178.	2.
137.0	0.	0.	0.	0.	0.	0.
138.0	0.	0.	0.	0.	178.	2.
139.0	0.	0.	0.	0.	358.	4.
140.0	0.	0.	0.	0.	358.	4.
141.0	0.	0.	0.	0.	178.	2.
142.0	0.	0.	0.	0.	178.	2.
143.0	0.	0.	0.	0.	715.	8.
144.0	0.	0.	0.	0.	358.	4.
145.0	0.	0.	0.	0.	715.	8.
146.0	0.	0.	0.	0.	1299.	15.
147.0	0.	0.	0.	0.	358.	4.
148.0	0.	0.	0.	0.	1120.	13.
149.0	0.	0.	0.	0.	0.	0.
150.0	0.	0.	0.	0.	178.	2.
151.0	0.	0.	0.	0.	763.	9.
152.0	0.	0.	0.	0.	0.	0.
153.0	0.	0.	0.	0.	0.	0.
154.0	0.	0.	0.	0.	0.	0.
155.0	0.	0.	0.	0.	0.	0.
156.0	0.	0.	0.	0.	715.	8.
157.0	0.	0.	0.	0.	0.	0.
158.0	0.	0.	0.	0.	178.	2.
159.0	0.	0.	0.	0.	894.	10.
TOTAL	23369.	6581.	6458.	35464.	45632.	534.

ESTIMATED NUMBERS OF FISH CAUGHT

MIDPOINT LENGTH (CM)	STRATUM 1	2	3	4	5	6	7	8	9	10
40.0	516.	89.	5.	7468.	11.	7456.	1988.	0.	0.	0.
41.0	2358.	405.	25.	34145.	51.	7456.	1988.	16.	937.	768.
42.0	3389.	582.	36.	49080.	73.	3728.	994.	32.	1874.	1535.
43.0	2355.	404.	25.	34099.	51.	7456.	1988.	72.	4254.	3484.
44.0	4564.	783.	48.	66084.	98.	14911.	3976.	79.	4701.	3850.
45.0	2870.	493.	30.	41567.	62.	18639.	4969.	44.	2624.	2149.
46.0	3830.	658.	40.	55468.	82.	11183.	2982.	43.	2581.	2114.
47.0	885.	152.	9.	12821.	19.	3728.	994.	93.	5550.	4546.
48.0	1476.	253.	16.	21369.	32.	14911.	3976.	121.	7181.	5882.
49.0	2066.	355.	22.	29917.	44.	11183.	2982.	209.	12432.	10182.
50.0	885.	152.	9.	12821.	19.	7456.	1988.	76.	4515.	3696.
51.0	295.	51.	3.	4274.	6.	11183.	2982.	92.	5495.	4500.
52.0	295.	51.	3.	4274.	6.	11183.	2982.	55.	3259.	2669.
53.0	0.	0.	0.	0.	0.	4437.	1183.	63.	3749.	3070.
54.0	0.	0.	0.	0.	0.	16859.	4495.	47.	2812.	2303.
55.0	0.	0.	0.	0.	0.	21826.	5819.	16.	937.	768.
56.0	0.	0.	0.	0.	0.	20227.	5393.	47.	2812.	2303.
57.0	0.	0.	0.	0.	0.	16859.	4495.	63.	3749.	3070.
58.0	0.	0.	0.	0.	0.	7456.	1988.	16.	937.	768.
59.0	0.	0.	0.	0.	0.	3728.	994.	16.	937.	768.
TOTAL	25784.	4428.	271.	373387.	554.	221865.	59156.	1200.	71336.	58427.
AVE. LENGTH(CM)	44.8	44.8	44.8	44.8	44.8	50.2	50.2	49.3	49.3	49.3
WEIGHT (METRIC TONS)	43.8	7.5	0.5	633.5	0.9	565.8	150.9	2.8	168.4	137.9

STRATUM	SPECIES	TITLE	
1	1976 SKIPJACK	ANNO-BON	JANUARY
2	1976 SKIPJACK	ANNO-BON	FEBRUARY
3	1976 SKIPJACK	ANGOLA	FEBRUARY
4	1976 SKIPJACK	ANNO-BON	AUGUST
5	1976 SKIPJACK	ANGOLA	AUGUST
6	1976 SKIPJACK	ANNO-BON	SEPTEMBER
7	1976 SKIPJACK	ANGOLA	SEPTEMBER
8	1976 SKIPJACK	SHERBRO	OCTOBER
9	1976 SKIPJACK	ANNO-BON	OCTOBER
10	1976 SKIPJACK	ANGOLA	OCTOBER

ESTIMATED NUMBERS OF FISH CAUGHT
****
STRATUM

MIDPOINT LENGTH (CM)	11	12	13	14	15	16	17	18	19	20
40.0	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41.0	301.	0.	0.	0.	0.	0.	0.	0.	0.	0.
42.0	602.	0.	0.	0.	0.	0.	0.	0.	0.	0.
43.0	1366.	0.	0.	0.	0.	0.	0.	0.	0.	0.
44.0	1509.	0.	0.	0.	0.	0.	0.	0.	0.	0.
45.0	843.	0.	0.	0.	0.	0.	0.	0.	0.	0.
46.0	829.	0.	0.	0.	0.	0.	0.	0.	0.	0.
47.0	1782.	0.	0.	0.	0.	0.	0.	0.	0.	0.
48.0	2306.	0.	0.	0.	0.	0.	0.	0.	0.	0.
49.0	3992.	0.	0.	0.	0.	0.	0.	0.	0.	0.
50.0	1450.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51.0	1764.	0.	0.	0.	0.	0.	0.	0.	0.	0.
52.0	1046.	0.	0.	0.	0.	0.	0.	0.	0.	0.
53.0	1204.	0.	0.	0.	0.	0.	0.	0.	0.	0.
54.0	903.	0.	0.	0.	0.	0.	0.	0.	0.	0.
55.0	301.	0.	0.	0.	0.	0.	0.	0.	0.	0.
56.0	903.	0.	0.	0.	0.	0.	0.	0.	0.	0.
57.0	1204.	0.	0.	0.	0.	0.	0.	0.	0.	0.
58.0	301.	0.	0.	0.	0.	0.	0.	0.	0.	0.
59.0	301.	0.	0.	0.	0.	0.	0.	0.	0.	0.
TOTAL	22907.	0.	0.	0.	0.	0.	0.	0.	0.	0.
AVE. LENGTH(CM)	49.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEIGHT (METRIC TONS)	54.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

STRATUM	SPECIES	TITLE
11	1976 SKIPJACK	ANNO-BON NOVEMBER
12		
13		
14		
15		
16		
17		
18		
19		
20		

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
40.0	17532.	2.09	2.09
41.0	48448.	5.77	7.86
42.0	61925.	7.38	15.24
43.0	55552.	6.62	21.86
44.0	100604.	11.99	33.84
45.0	74290.	8.85	42.70
46.0	79811.	9.51	52.21
47.0	30580.	3.64	55.85
48.0	57521.	6.85	62.70
49.0	73382.	8.74	71.45
50.0	33068.	3.94	75.39
51.0	30645.	3.65	79.04
52.0	25823.	3.08	82.11
53.0	13706.	1.63	83.75
54.0	27419.	3.27	87.01
55.0	29667.	3.53	90.55
56.0	31684.	3.78	94.32
57.0	29440.	3.51	97.83
58.0	11465.	1.37	99.20
59.0	6743.	0.80	100.00
TOTAL	839305.	100.00	
AVE. LENGTH(CM)	47.450		
WEIGHT (METRIC TONS)	1766.0		

Estimated numbers of skipjack tuna by month caught by American tuna purse seiners from the eastern Atlantic

...6 SK...ACK   PAGE 1
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MIDPOINT LENGTH (CM)	JAN.	FEB.	AUG.	SEPT.	OCT.	NOV.
41.0	516.	94.	7479.	9444.	0.	0.
42.0	2358.	430.	34196.	9444.	1721.	301.
43.0	3389.	618.	49153.	4722.	3441.	602.
44.0	2355.	429.	34150.	9444.	7810.	1366.
45.0	4564.	831.	66182.	18837.	8630.	1509.
46.0	2870.	523.	41629.	23608.	4817.	843.
47.0	3830.	698.	55550.	14165.	4738.	829.
48.0	885.	161.	12840.	4722.	10189.	1782.
49.0	1476.	269.	21401.	18887.	13184.	2306.
50.0	2066.	377.	29961.	14165.	22823.	3992.
51.0	885.	161.	12840.	9444.	8299.	1450.
52.0	295.	54.	4280.	14165.	10087.	1764.
53.0	295.	54.	4280.	14165.	5983.	1046.
54.0	0.	0.	0.	5620.	6882.	1204.
55.0	0.	0.	0.	21354.	5162.	903.
56.0	0.	0.	0.	27645.	1721.	301.
57.0	0.	0.	0.	25620.	5162.	903.
58.0	0.	0.	0.	21354.	6882.	1204.
59.0	0.	0.	0.	9444.	1721.	301.
60.0	0.	0.	0.	4722.	1721.	301.
TOTAL	25784.	4699.	373941.	281021.	130963.	22907.

ESTIMATED TOTAL NUMBERS OF FISH(ALL STRATA)

MIDPOINT LENGTH(CM)	NUMBERS	PERCENT	CUMULATIVE PERCENT
84.0	101.	6.00	6.00
85.0	34.	2.00	8.00
86.0	67.	4.00	12.00
87.0	169.	10.00	22.00
88.0	101.	6.00	28.00
89.0	202.	12.00	40.00
90.0	135.	8.00	48.00
91.0	67.	4.00	52.00
92.0	169.	10.00	62.00
93.0	101.	6.00	68.00
94.0	67.	4.00	72.00
95.0	67.	4.00	76.00
96.0	101.	6.00	82.00
97.0	67.	4.00	86.00
98.0	169.	10.00	96.00
99.0	67.	4.00	100.00
TOTAL	1684.	100.00	
AVE. LENGTH(CM)	91.420		
WEIGHT (METRIC TONS)	28.0		

Fork Length (cm)	SMALL BLUEFIN June	SMALL BLUEFIN July	LARGE BLUEFIN September
50-54		153	
55-59	1	418	
60-64		14	
65-69	1		
70-74	20	37	
75-79	101	639	
80-84	19	300	
85-89	6	35	
90-94	199	236	
95-99	480	524	
100-104	60	253	
105-109	1	24	
180-189			2
190-199			2
200-209			6
210-219			10
220-229			19
230-239			26
240-249			39
250-259			48
260-269			21
270-279			10
280-289			1

APPENDIX A

irregular break in the numbering system, going from p. 45 to p 148.

Instructions for Sampling Tuna Landings in Puerto Rico -- 1977-78

March 1977

Tuna Assessment Task
Southwest Fisheries Center
La Jolla, California

Table of Contents

Priorities for 1977 -- Atlantic tunas

I. Fleets

1) Transshipments of U.S., Dutch, Panamanian and Canadian seiners.

2) Transshipments of Tema-based catcher vessels.

3) Transshipments of Spanish and French seiners.

4) Transshipments of Tema cold stores.

5) Transshipments of albacore except from Canary Islands and Capetown.

II. Species

1) yellowfin

2) skipjack

3) bigeye

4) albacore

5) bluefin

6) black skipjack

7) others

Sampling for Length Frequency

Sampling YF/BE for length frequency

1) Specimen drawn at random, broken fish discarded.

2) Species determined from external characters, uncertain fish tallied as UNK. YF/BE.

3) Fish measured for fork length to nearest centimeter. All fish measured except UNK. YF/BE.

4) Procedures 1-3 repeated until 50 fish of target species drawn - forms: (1) L-freq. (LF0001), (2) species comp. (LF0002).

5) Liver checked for species identification. All fish checked for liver i.d. Both bigeye tuna and yellowfin must be dissected. Procedure should be used for small and medium sized fish.

6) Procedures 1-5 repeated until 50 fish of target species drawn - forms: (1) L-freq. (LF0001), (2) species comp. (LF0002), (3) biological sample (LF0003).

Sampling other species for length frequency

1) Specimen drawn at random, broken fish discarded.

2) Species determined by external characters.

3) Fish measured for length. All fish measured except UNK. YF/BE.

(4) Procedures 1-3 repeated until 50 fish of target species drawn - forms (1) L-freq. (LF0001), (2) species comp. (LF0002). (Only when the mixture of other species in the catch is large.)

General Instructions for Sampling Landings

Transshipments

1) Tema-based baitboats.

Minimum length-frequency samples: total of 4-6 samples (2-4 YF and 2 SJ) from the unloadings of two catcher vessels on each transshipment. At least one sample must be drawn from each unloaded size category.

2) American

Minimum length-frequency samples: 2 samples of each species from the catch of each catcher vessel. At least one sample drawn from each size category unloaded.

3) Spanish and French seiners

a. Catcher vessels

Minimum length-frequency samples: same as tema-based baitboats

b. Hatch and deck (transshipment)

Four samples of yellowfin and 2 of skipjack

4) Albacore vessels

Minimum length-frequency samples: 4 samples distributed throughout the total catch.

Biological Samples

Type 1: Length-weight

Measure:		
	Yellowfin :	<40 cm. >70 cm.
	Bigeye :	all sizes
	Skipjack :	>55 cm. <40 cm.
	Others :	all sizes

Type 2: Yellowfin/bigeye liver identification.

Identify as many as time permits.

Procedures for taking Type 1 and Type 2 samples:

1) Go into weigh master's shack and look at the cargo loading plan to determine what bill of lading is being off-loaded from each of the hatches and decks.

2) Go aboard vessel to see what type and sizes of fish are available for sampling and determine which hatch and deck is to be sampled.

3) Record information, catcher vessel, refer vessel, port transhipped, etc., from the cargo loading plan on the top margin of the plastic sampling sheet.

4) Obtain bucket of type and size fish previously selected to be sampled.

5) Estimate the quantity of target species in the bucket by observing fish at the top of the bucket.

6) Remove 70 to 100 fish from the bucket. As the estimated quantity of the target species in the bucket approaches 50 percent, the number fish to remove should approach 100.

7) Place fish in a stack on the plastic measuring sheet and wash fish with water to remove frost and begin the thawing process.

8) Count the number of broken fish in the bucket.

9) Select one fish from the stack and identify the species by external characteristics.

10) With species other than yellowfin or bigeye perform steps 11, 12 and 14.

11) Measure the fork length of the fish and record on the plastic sampling card under the respective species.

12) Weight the fish and record the weight on the plastic sampling card next to the length measurement. Only fish which are needed to cover the size distribution are to be weighed and only as time permits.

13) Cut the fish at the anterior ventral visceral region to expose the liver lobes. Verify the species by observing the liver (smooth = yellowfin, veined or striated = bigeye). If the liver identification differs from the external identification place an arrow on the plastic sampling card next to the length and weight measurement pointing to the correct species column.

14) Place fish back in bucket and repeat steps 9-14.

15) Transfer information from plastic sampling card to biological sampling form (LF0003).

16) Number biological sampling form consecutively for each year starting at 1.

Yellowfin/Bigeye External Identifying Characters Used to Separate Species

Yellowfin

1) Eye comparatively small.

2) Body form slender (body depth less then 25 percent of F/L).

3) Alternating white stripes and chains of dots (more then 10) on sides of body usually curving backwards toward ventral side.

Larger fish >75 cm.

4) Long second dorsal and anal rays.

5) Pectoral fins not extending past dorsal fin.

Bigeye

1) Eye comparatively large.

2) Body form robust (body depth greater then 25 percent of F/L).

3) White bars (stripes; less than 8) run straight down sides. Grayish white spots on abdominal region are helpful when present.

Larger fish >75 cm.

4) Normal second dorsal and anal rays.

5) Pectoral fins extend beneath second dorsal fin but not as far as the second dorsal finlet.

Special Experiment 1 -- Species composition of broken and unbroken fish for 1977

Number of samples: 10 pairs

Sample size: 25 fish

Procedure:

1) Select 25 broken and 25 unbroken fish randomly from a bucket of small to medium size yellowfin and bigeye.

2) Place fish on plastic sheet in two rows broken and unbroken fish respectively.

3) Wash fish off with water.

4) Identify using external characters the yellowfin and the bigeye in the unbroken sample. Uncertain fish are discarded.

5) Measure all fish in the unbroken sample for fork length and record on the plastic card under the respective species.

6) Cut the anterior visceral region to expose the liver and identify by liver characteristics the yellowfin and bigeye in the unbroken sample. If the liver identification differs from the external identification indicate this by placing an arrow pointing from the plastic sheet, to the correct species column on the sheet. (If the liver is unidentifiable indicate such by placing a dash after the length of the specimen on the plastic card.)

7) Fish from the unbroken sample are returned to the bucket immediately after livers have been checked.

8) Repeat steps 4,6, and 7 for the broken sample.

9) Fill out data forms LF0001, length frequency for unbroken fish and forms LF0002, species comp., and LF0003, biological samples for both the broken and unbroken fish. Be sure to leave the positive identification and liver identification columns on form LF0003 blank if the livers were unidentifiable.

Special Experiment 2 - - Parasites in right and left nares

Number of samples: 10

Sample size: 25 fish

Procedures:

1. Specimen drawn at random, broken fish discarded.
2. Liver checked for species i.d.
3. Length measured.
4. Nares, right and left, checked for parasites.
5. Parasites placed in vials, separate for right and left nares.

Form: (1) biological sample (LF0003).

Special Experiment -- 3 Otolith Samples for 1977

Species: Skipjack

Number of Samples: 150 to 200 otoliths

Sizes of Fish: 10-15 otoliths per 5 cm. size groupings starting at size group 21-25 cm., sample large fish as encountered.

Area: Gulf of Guinea

Form: Biological sample form

Numbering Scheme: Forms are treated as biological sample form by numbering sequentially. Sample vials are numbered on the cap indicating the biological sample number and the number of the specimen within the sample (e.g., 3-9 indicates the otoliths are from fish number 9 on biological sample number 3).

Procedures:

1) Select and identify by external characters specimens of desired lengths during length frequency sampling and place in cold stores until time permits further sampling steps.

2) On day of otolith sampling remove specimens of sizes that are being prepared for production and thaw by running water over them.

3) Record information for top of Biological Sample form on plastic sampling card.

4) Measure specimen for fork length in millimeters and record on plastic sampling card.

5) Weigh specimen and record next to length on the plastic sampling card.

6) When the specimen is completely thawed use a saw to cut specimen from the dorsal side at a point forward of the midline between the eye and preoperculum. The incision should sever the front of the head from the rest of the specimen.

7) Extract the exposed brain tissue from specimen.

8) Remove all extraneous matter from the brain cavity with a gentle stream of water from a squeeze bottle thereby exposing the semi-circular canal system with its attached otoliths. Otoliths are located in the bottom of the brain cavity.

9) Carefully extract exposed otoliths with forceps.

10) Place otolith in vial filled with water.

11) Repeat steps 4-10 for all specimens.

12) Wash all otoliths to remove all foreign matter and place in clean vial with distilled water.

SAMPLING SORTED FISH

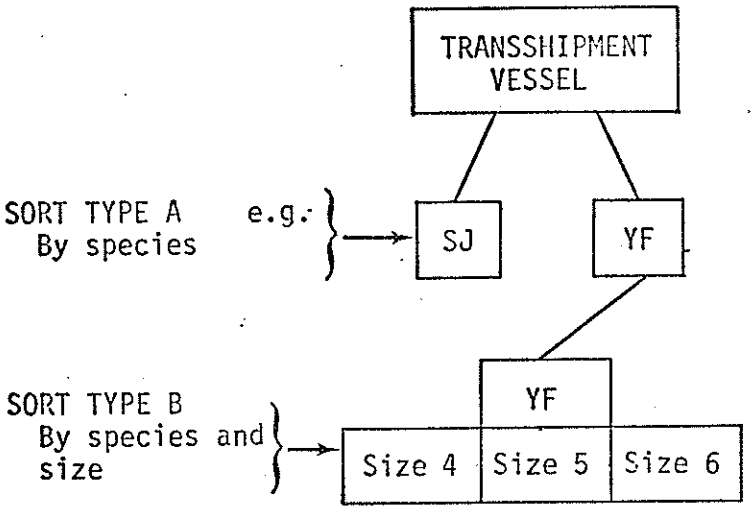


Diagram of the different ways in which the catches are unloaded by the canneries

This diagram shows the two ways in which the transshipped catch may be sorted by the cannery before you take a sample: (Note, no sorting is to be done by the person sampling the catch.)

Type A: sorted by species only

Type B: sorted by species and size

I. To sample a type A sort:

A) Indicate the type or sort on both the species composition and length frequency forms (e.g., SORT TYPE A). A suggested location to enter this information is shown on both forms.

B) Take a sample of yellowfin and a sample of skipjack. A species composition need only be taken for yellowfin. Enter '0' in 'SIZE CODE'.

C) Fill out the rest of the form as usual making sure to include the Flag, Area, and Gear (surface or longline as a minimum).

II. To sample a type B sort

A) Indicate the type of sort on both the species composition and length frequency form (e.g., SORT TYPE B).

B) Take a sample of yellowfin, and skipjack and enter the code for the size group which you are sampling.

C) Complete the rest of the form as usual.

III. Summary of new codes.

A) SORT TYPE

1) 'A' = by species

2) 'B' = by species and size groups

B) SIZE CODE

1) '0' = not unloaded by size groups

2) 4 = small

3) 5 = large

4) 6 = mixed (small and large)

II-3. — Measuring techniques

II-3-1. — Where to sample

The best place to sample is on board fishing vessels at time of fishing. This ensures recording actual time and place of catch, and is desirable particularly for fisheries catching tuna in a widespread area, a little at a time (like longline fishery or trolling).

Sampling can be made at landing ports for some surface fisheries (purse seine and live-bait fishing). Ensure time and area of actual catch. It is desirable to sample fish being unloaded from a fish well holding the catch of a whole set or a part of it. Thus, origin of sample can be accurately pinpointed as to area and time of capture.

If boat is known to have remained in a previously discussed sampling area throughout her trip and the cruise is concluded within a month, probably any fish from that ship can be sampled and assigned to that particular area and time, even if the location and time of catch cannot be pinpointed.

II-3-2. — Selecting fish

Fish should be sampled at random. If sampling is done during fishing operations, one fish out of every 5 or 10 (or whatever frequency is most suitable) can be selected for measurement. The other way to achieve a random sampling is to select the first 10, 20, 30 or 50 fish of each species brought aboard.

At a port it is more desirable to sample fish from the moving line by which fish are being delivered. One from every certain number of fish can be selected for measurement (for example, every fifth fish). If the condition of the fish selected is not suitable for measurement, the next fish can be measured, or that turn can be skipped. When more than one species are mixed in a catch, first sample one species, then the other.

If circumstances do not permit the above procedure and one has to select from a pile of fish, it is probably best to separate a section from the pile including fish from both top and bottom, and measure them. Exercise caution because sometimes large fish are selectively placed at the bottom of the pile or vice versa. In this way, if only the fish at the top of the pile are measured, the sample is biased.

II-3-3. — Equipment used for measurement

Calipers may be the most convenient tool for measuring (Figure 2). They are easily made, but if a pair is required, write to the ICCAT Secretariat and they will be sent to you.

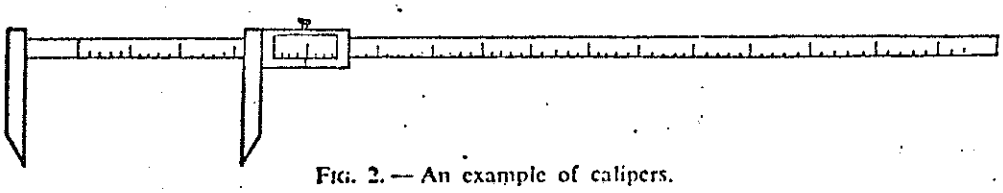


FIG. 2. — An example of calipers.

II-3-4. — How to measure fish

Tunas: All species except billfishes must be measured in fork length — that is, a projected straight distance from the tip of the upper jaw to the posterior tip of the shortest caudal ray (fork). (Figure 4.)

Billfishes: Billfishes must be measured in lower jaw-fork length — that is, a projected straight distance from the tip of the lower jaw to the posterior tip of the shortest caudal ray (fork). (Figure 4.)

The fish should be placed on a flat surface in a horizontal position while being measured. Fish with broken snout or tail, or frozen fish not in straight position should be rejected.

If the above measurements are impossible, or if too many fish are rejected for the above reason, measurement can be taken at certain other parts of the body, or weight can even be taken instead of measurement. When summarized size frequencies weighted by catch (Form 3-5) are reported, those measurements should be converted to standard length as discussed above, using a conversion factor calculated from sufficient sampling.

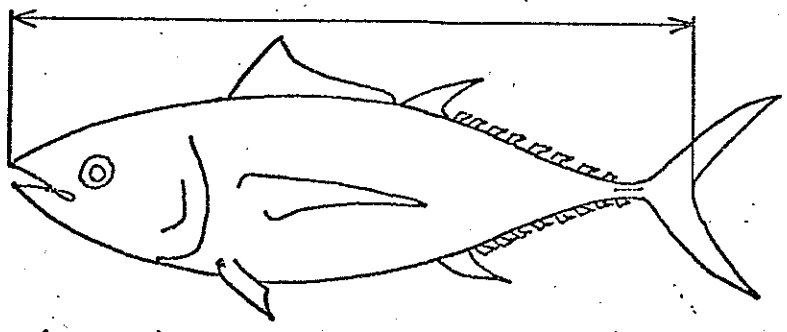
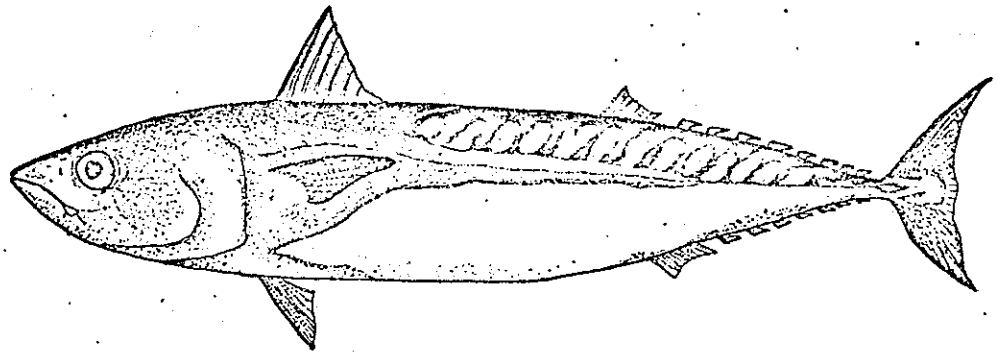


FIG. 4. — Measurements of tuna-shaped fish (upper jaw-fork length) and billfish (lower jaw-fork length).

ORDER: Scombriformes
FAMILY: Scombridae

Sheet No. 11
1972

SCIENTIFIC NAME: *Auxis rochei* (Risso)
SYNONYMS STILL IN USE: *Auxis thynnoides*
A. tapeinosoma
(A. thazard)



VERNACULAR NAMES:

	ICCAT	FAO
En:	Bullet mackerel	Bullet mackerel

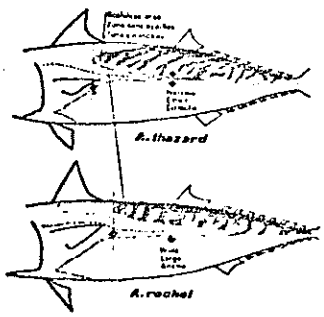
NATIONAL. — JAPN: Marusoda
USA: Bullet mackerel
USSR: Skumbrievyi tunets

DISTINCTIVE CHARACTERS AND DIAGNOSIS:

Round fusiform body. Caudal portion very short. Teeth on both jaws only. First and second dorsal fins separated by a distance equal to or greater than snout length. Interpelvic process single and very large, equal to length of pelvic fins; body scaly anteriorly, naked posteriorly; dorsal finlets 8; anal finlets 7. Wide corselet of scales (6-20 scales) under second dorsal fin origin.

Fresh specimen has overall bluish iridescence. Wavy bars on side above and behind corselet. Black patch at postero-ventral border of eye. Anal fins and finlets almost colorless, with white patch around base.

DISTINCTION FROM MOST SIMILAR SPECIES OCCURRING IN THE AREA:



Many scientists believe that *Auxis rochei* is the same species as *A. thazard*. *A. thazard* is identified by its narrow corselet of scales (no more than about five scales wide under second dorsal fin origin) compared to *A. rochei* which has wider corselet (6-20 scales). Pectoral fin of *A. thazard* extends posteriorly to beginning of scaleless area above corselet while in *A. rochei* pectoral fin does not reach beginning of scaleless area. Dark wavy line in the dorsal scaleless area usually oblique to nearly horizontal in *A. thazard* while in *A. rochei* nearly vertical.

Gill rakers on lower limb of 1st arch count 31 to 36 in *A. rochei* compared to 29 to 32 in *A. thazard*.

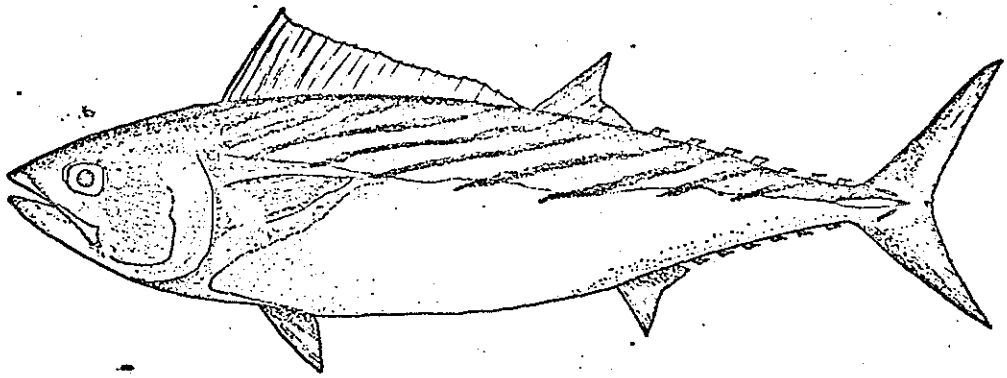
SIZE:

Maximum: Common:

ORDER: Scombriformes
FAMILY: Scombridae

Sheet No. 9
1972

SCIENTIFIC NAME: *Sarda sarda* (Bloch)
SYNONYMS STILL IN USE: None



VERNACULAR NAMES:

	ICCAT	FAO
En:	Atlantic bonito	Atlantic bonito (Belted pelamid)
Fr:	Bonite à dos rayé	Bonite à dos rayé
Sp:	Bonito	Bonito

NATIONAL.—

BRAZ:	Sarda	MORC:	Bonite
CAND:	Atlantic bonido Bonite à dos rayé	PORT:	Bonito
		S. AFR:	Bonito Katonke
FRAN:	Bonite à dos rayé		
GERM:	Pelamide	SPAN:	Bonito
JAPN:	Hagatsuo	USA:	Atlantic bonito
KORE:	Dae-seo-yang-chul-sam-chi	USSR:	Pelamida

DISTINCTIVE CHARACTERS AND DIAGNOSIS:

Five to eleven longitudinal dark oblique stripes on upper part of body. First dorsal spines 20-23. Gill rakers 16-24 on first arch. No teeth on tongue. Teeth are sometimes present on vomer. Body covered with tiny scales. Caudal peduncle very slender, with well developed keel on each side at base of caudal fin. First dorsal long, nearly reaches second dorsal.

Steel-blue above, silvery below. Back and sides in adults have several dark stripes running obliquely downward and forward. Dorsal and caudals dusky. Pectoral pale. Other fins more or less silvery.

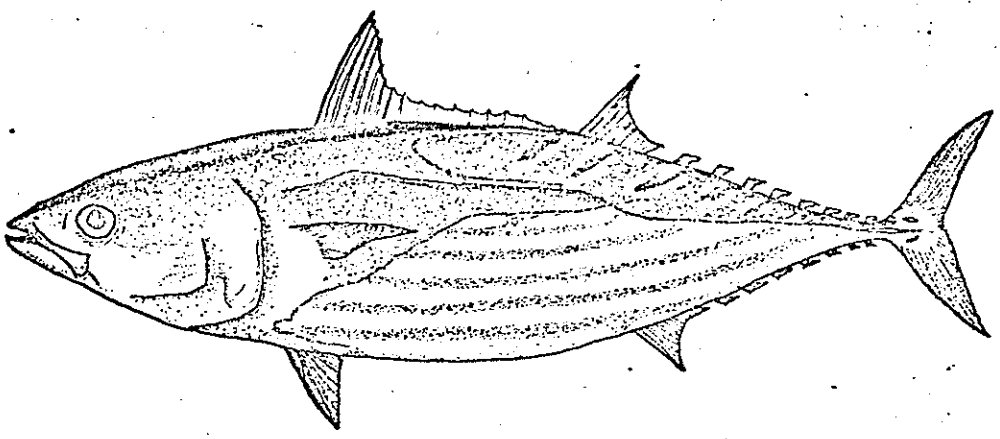
SIZE:

Maximum: 85 cm Common:

ORDER: Scombriformes
FAMILY: Scombridae

Sheet No. 8
1972

SCIENTIFIC NAME: *Katsuwonus pelamis* (Linnaeus)
SYNONYMS STILL IN USE: *Euthynnus pelamis*



VERNACULAR NAMES:

	ICCAT	FAO
En:	Skipjack	Skipjack tuna
Fr:	Bonite à ventre rayé	Bonite à ventre rayé
Sp:	Listado	Listado

NATIONAL.— BRAZ: Bonito de barriga listada
CAND: Skipjack
Thonine à ventre rayé
FRAN: Bonite à ventre rayé
JAPN: Katsuo
KORE: Ga-da-raeng-i
MORC: Listao
PORT: Gaiado
S. AFR: Skipjack
SPAN: Listado
TAIW: Theng chien
USA: Skipjack tuna
USSR: Okeanskii bonito

DISTINCTIVE CHARACTERS AND DIAGNOSIS:

Three to five prominent dark longitudinal stripes on lower part of body. Gill rakers 53-63 on first arch. No teeth on palatines, vomer or tongue. First dorsal spines 15-16.

Dark purplish blue on dorsal side and silvery on ventral. Several dark stripes run along the body in ventral part. When dead, these appear as horizontally continuous lines, but while alive they are not continuous and do not form horizontal nor vertical lines.

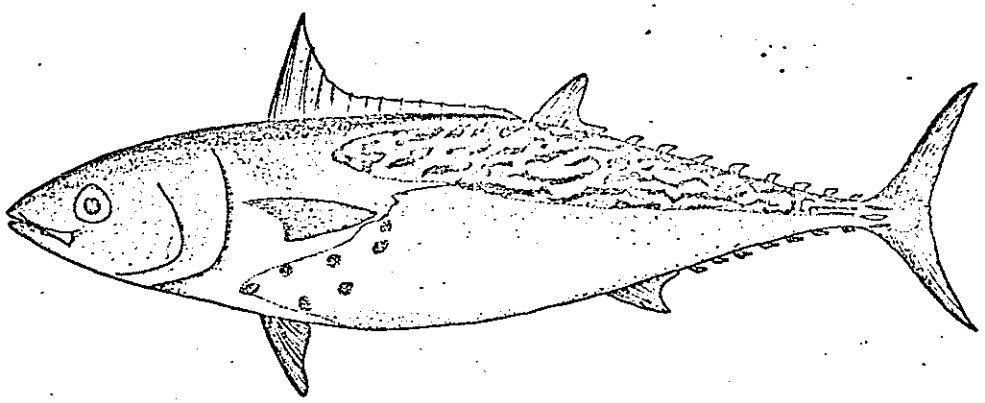
SIZE:

Maximum: Occasionally exceed 90 cm Common: 40 to 70 cm.

ORDER: Scombriformes
FAMILY: Scombridae

Sheet No. 7
1972

SCIENTIFIC NAME: *Euthynnus alletteratus* Rafinesque
SYNONYMS STILL IN USE: None



VERNACULAR NAMES:

	ICCAT	FAO
En:	Atlantic little tuna	Atlantic little tuna
Fr:	Thonine	Thonine de l'Atlantique
Sp:	Bacoreta	Bacoreta del Atlántico

NATIONAL. — (BERM: Mackerel)
BRAZ: Bonito pintado
CAND: Little tunny
FRAN: Thonine (de l'Atlantique)
JAPN: Yaito
MORC: Bacorette
PORT: Merma
S. AFR: Little tunny
SPAN: Bacoreta
USA: Little tunny / Blk skipjack
USSR: Piatnistyi tunets

DISTINCTIVE CHARACTERS AND DIAGNOSIS:

Body naked behind anterior corselet. Pectoral fin rays 26-27.

Dark blue on dorsal part with complicated striped pattern. Silvery gray on ventral side. Several dark spots between pelvic and pectoral fins characterize the species. Gill rakers 37-43 (in skipjack 53-63).

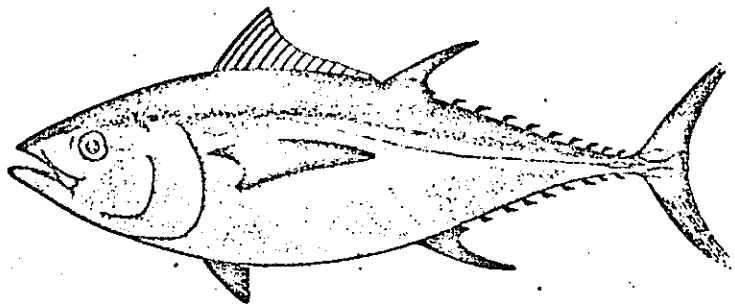
SIZE:

Maximum: about 100 cm.

ORDER: Scombriformes
FAMILY: Scombridae (Thunnidae)

Sheet No. 5
1972

SCIENTIFIC NAME: *Thunnus obesus* (Lowe)
SYNONYMS STILL IN USE: *Parathunnus obesus*
Parathunnus sibi



VERNACULAR NAMES:

	ICCAT	FAO
En:	Bigeye tuna	Bigeye tuna
Fr:	Thon obèse	Thon obèse
Sp:	Patudo	Patudo

NATIONAL. —	BRAZ:	Albacora-bandolin	PORT:	Patudo
	CAND:	Bigeye tuna	S. AFR:	Bigeye tunny
		Thon ventru		Grootoog tuna
	FRAN:	Thon obèse	SPAN:	Patudo
	JAPN:	Mebachi	TAIW:	Tha mu we
	KORE:	Nun-da-raeng-i	USA:	Bigeye tuna
	MORC:	Thon obèse	USSR:	Bol'sheglazyi tunets

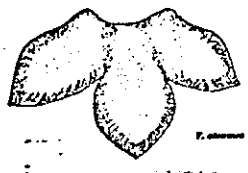
DISTINCTIVE CHARACTERS AND DIAGNOSIS:

Stocky body and big eyes characterize the species. Pectoral fin in adult extends beneath second dorsal fin but not beneath second dorsal finlet. Large head. Body depth exceeds 25 % of standard fork length. Second dorsal and anal rays are relatively short. Liver striated on ventral surface. Gill rakers 25-31 (in Atlantic).

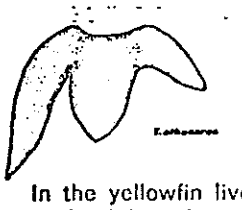
Dorsal side metallic dark blue. Ventral silvery white. Side yellowish purple. Young have greyish white spots on ventral side. Fins: 1st dorsal greyish yellow — 2nd dorsal and anal light yellow. Finlets: light yellow edged with black.

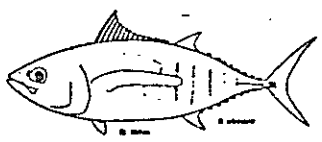
DISTINCTION FROM MOST SIMILAR SPECIES OCCURRING IN THE AREA:

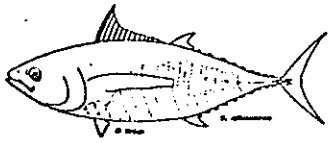
Immature yellowfin *(Thunnus albacares)*, albacore *(T. alalunga)* and blackfin *(T. atlanticus)* have eyes of size comparable to young bigeye. *(T. obesus)*, and pectoral fins of young bigeye are as long as those of albacore of comparable size.



Also, bigeye is often caught together with yellowfin by surface gear. Young fish resemble each other and are often confused. White stripes on side of the body usually curve backwards toward the ventral side in yellowfin, while in bigeye they normally run straight down. Stripes appear alternately in an unbroken line and in a chain of dots in yellowfin, but appear only as an unbroken line in bigeye. Yellowfin has more than 10 stripes, bigeye less than 8.







In the yellowfin liver, right lobe is longer than central lobe, and all lobes are rather pointed, while in bigeye the central lobe is the longest, with all lobes being less pointed. Liver striated in bigeye but not in yellowfin.

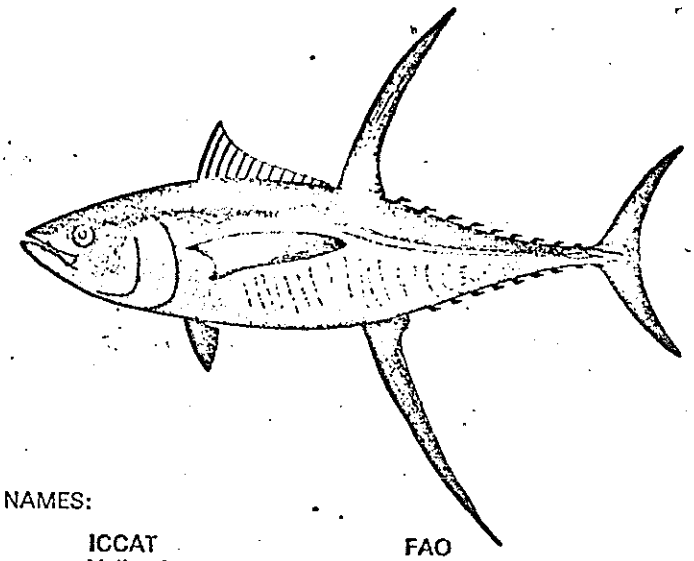
SIZE:

Maximum: 190 cm.
Common: 40 to 170 cm.

ORDER: Scombriformes
FAMILY: Scombridae (Thunnidae)

Sheet No. 3
1972

SCIENTIFIC NAME: *Thunnus albacares* (Bonnaterre)
SYNONYMS STILL IN USE: *Neothunnus macropterus*



VERNACULAR NAMES:

	ICCAT	FAO
En:	Yellowfin tuna	Yellowfin tuna
Fr:	Albacore	Albacore
Sp:	Rabil	Rabil

NATIONAL.— BRAZ: Albacora de lage
CAND: Yellowfin tuna
Albacore à nageoires noire
FRAN: Albacore
JAPN: Kihada
KORE: Huang-da-raeng-i
MORC: Albacore
PORT: Albacora
S. AFR: Yellowfin tunny
Geelvin tuna
SPAN: Rabil
TAIW: Huang chi we
USA: Yellowfin tuna
USSR: Zheltoperyi tunets

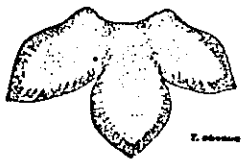
DISTINCTIVE CHARACTERS AND DIAGNOSIS:

Slender fusiform body — body depth less than 25 % of fork length. Small eyes and head, longer second dorsal and anal rays than other tunas. These traits vary with size of fish and area of catch. Liver without striations on ventral surface. Gill rakers 26-35.

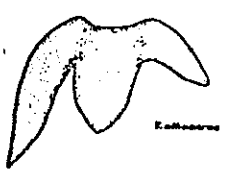
Dorsal skin dark blue —ventral silvery gray— side golden. Young (less than 120-130 cm) have chains of white spots. Fins: 1st D. F. lemon yellow — 2nd D. F. and A. F. yellow. Finlets: yellow with black edges.

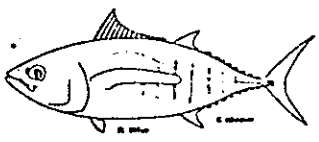
Anal fin and second dorsal fin long in adults only. III-15

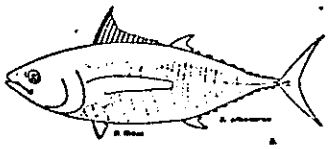
DISTINCTION FROM MOST SIMILAR SPECIES OCCURRING IN THE AREA:



Bigeye *(Thunnus obesus)* is often caught together with yellowfin *(T. albacares)* by surface gear. Young fish resemble each other and are often confused. White stripes on side of the body usually curve backwards toward ventral side in yellowfin, while in bigeye they normally run straight down. Stripes appear alternatively in an unbroken line and in a chain of dots in yellowfin, but, appear only as un unbroken line in bigeye. Yellowfin has more than 10 stripes, bigeye less than 8.







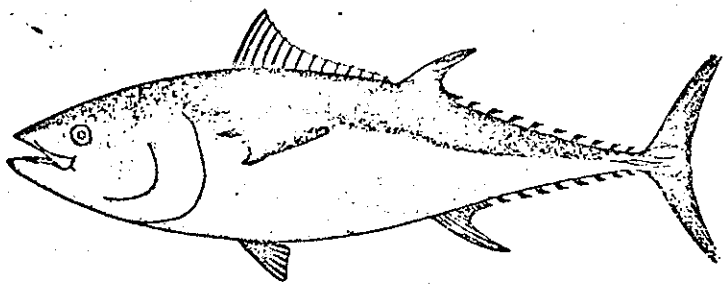
In the yellowfin liver, right lobe is longer than central lobe, and all lobes are rather pointed, while in bigeye the central lobe is the longest, with all lobes being less pointed. Liver striated in bigeye but not in yellowfin.

SIZE:
Maximum: 190 cm.
Common: 40 to 170 cm.

ORDER: Scombriformes
FAMILY: Scombridae (Thunnidae)

Sheet No. 1
1972

SCIENTIFIC NAME: *Thunnus thynnus thynnus* (Linnaeus)
SYNONYMS STILL IN USE: *Thunnus thynnus*



VERNACULAR NAMES:

	ICCAT	FAO
En:	Bluefin tuna	Bluefin tuna Northern Atlantic
Fr:	Thon rouge	Thon rouge Atlantique Nord
Sp:	Atún	Atún Atlántico Norte

NATIONAL.—

BRAZ:	Atúm	NETH:	Tonijin
CAND:	Bluefin tuna Thon rouge	NORW:	Makrellstørje
DENM:	Tunfisk	POLN:	Tuńczyk
FINL:	Tonnikala	PORT:	Atûm
FRAN:	Thon rouge	S. AFR:	Bluefin tunny Blouvin tuna
GERM:	Thunfisch	SPAN:	Atún
ICEL:	Túnfiskur	SWED:	Tonfisk
JAPN:	Kuromaguro	TAIW:	Hay we
KORE:	Cham-da-raeng-i	USA:	Bluefin tuna
MORC:	Thon rouge	USSR:	Tunets

DISTINCTIVE CHARACTERS AND DIAGNOSIS:

Fusiform body compressed and very robust in front. Short pectoral fin scarcely reaching origin of 2nd dorsal fin. Height of 2nd dorsal longer than that of 1st dorsal. Caudal keel black at adult stage. Semi-transparent when immature. Liver striated on ventral surface. Gill rakers 34-43.

Dorsal skin dark blue or black. Ventral skin silvery gray with colorless transverse lines and rows of colorless dots in alteration. These run vertically in young and gradually bend backwards toward median ventral line as fish grows. Fins: 1st dorsal obscure yellow —2nd dorsal and anal grayish yellow. Finlets: grayish yellow edged with black.

DISTINCTION FROM MOST SIMILAR SPECIES OCCURRING IN THE AREA:

Thunnus thynnus thynnus has caudal keels black in adult and semi-transparent in young while *T. maccoyii* (southern bluefin) has yellow caudal keel. Fork length is 4.6 to 6.0 times length of pectoral fin in bluefin, 4.4 to 4.6 in southern bluefin tuna.

SIZE:

Maximum: over 300 cm Common: 40 to 200 cm.

Instructions for completing form LF0001

Form LF0001 is used for reporting fork length of yellowfin, skipjack, little tunny, bigeye and albacore tunas. Samples measured from catcher vessels, transshipment vessels or single sets, are recorded on this form.

[Front -- Items 1-13]

1. VESSEL:

   Enter the name of the catcher vessel.

2. TRANSSHIPMENT:

   Enter the name of the transshipment vessel, if applicable.

3. DATE:

   Enter the date of sampling.

4. TONNAGE:

   Enter the total tonnage of catch. Indicate tonnage of yellowfin (YF), tonnage of skipjack (SJ), and tonnage of others (OTHERS). Tonnage should be specified by species. Report tonnage in short tons or specify unit of weight used. If tonnage is unavailable, e.g. for insignificant catches, specify.

5. RANDOM/SELECT:

   Circle the sampling technique used. If SELECT is circled, specify procedure in comment section.

6. HOLD/WELL/SET:

   Circle the sampled unit. Enter the number of the hold if the sample is from a transshipment, the number of the well if

the sample is from a catcher vessel in port or the number of the well and the number of the set (e.g. P7-2) if the sample is from a single set. Holds and wells are numbered from bow to stern, separate numbering for the Port (P) and Starboard (S) wells.

7. MEASURED BY:

   Enter the name of the sampler, first and last name.

8. SPECIES:

   Enter the name of the target species measured. The name may be abbreviated: SJ=skipjack, YF=yellowfin, BE=bigeye, ALB=albacore, BSJ=black skipjack.

9. SAMPLE NO.:

   Enter the sample number. Numbering begins with one for each species and continues sequentially for each year. If single set samples; numbering begins with one for each species, year and vessel.

10. OCEAN:

    Enter the name of the ocean in which the fish were caught. ATL. for Atlantic, PAC. for Pacific and IND for Indian Ocean.

11. TIME:

    Item 11 is for single set samples only. Enter the set time, i.e., the time that the seine skiff is released.

25-188

Each specimen in the sample is measured and tallied in the appropriate one centimeter length interval. When all of the

specimens have been measured and tallied, enter the total number for each length interval in the spaces provided. Length is in fork length, if otherwise, specify under item 13.

12. TOTAL NO.:

Enter the total number of specimens sampled.

13. COMMENTS:

Enter any remarks about the sampling process such as method of selection, representativeness of sample, etc.

[Back]

Additional information about the sample which is obtained from logbooks, landing receipts, the captain, etc. is recorded on this side of form LF0001. Complete the section which pertains to the type of sample. If HOLD of item 6 is circled, complete TRANSSHIPMENT INFORMATION; if WELL is circled, complete CATCHER VESSEL INFORMATION; if SET is circled, complete SINGLE SET INFORMATION.

TRANSSHIPMENT INFORMATION

1. MANIFEST NO.:

Enter the number of the cargo manifest.

2. PORT OF LANDING:

Enter the name of the port at which the catch was unloaded from the transshipment vessel.

3. PORT TRANSSHIPPED:

Enter the name of the port at which the catch was unloaded from the catcher vessel to the transshipment vessel or from cold stores to the transshipment vessel.

4. CARGO PLAN WEIGHT:

   Enter total tonnage of catch from cargo loading plan. Indicate tonnage (in short tons) by species. Specify species in OTHER category. If units other than short tons is used, note the units.

5. MANIFEST WEIGHT:

   Enter the catch, in short tons, of yellowfin (YF), skipjack (SJ), other, and total from the reefer manifest. If units other than short tons are used, note here. Specify species in OTHER category.

6. SIZE BREAKDOWN:

   If the fish are separated by size during unloading, enter the weight for each size group. The weights are unloading weights in short tons. Note any changes in units. Circle the size groups or group from which the sample was taken.

7. FISH CONDITION:

   Enter the condition of the sampled fish, e.g., frozen round, gilled and gutted, etc.

8. DATE OF LANDING:

   Enter the date (day, month and year) on which the transshipment vessel unloaded at the port of landing.

9. DATE TRANSSHIPPED:

   Enter the date (day, month and year) on which the catch was transshipped from the port transshipped.

10. MIXED/PURE:

Circle mixed or pure which describes the species composition of the sampled unit.

11. COMMENTS:

Enter all additional remarks. Note the flag of the catcher vessel.

CATCHER VESSEL INFORMATION

1. FLAG:

Check the flag represented by the catcher vessel. If others is checked, enter the name of the country, e.g. _____ others French .

2. MONTH:

Enter the month in which the fish in the sampled well were caught.

3. PORT OF LANDING:

Enter the name of the port at which the sample was taken.

4. SET DISTRIBUTION:

The tonnage, by species, of each set which contributed to the sampled well should be listed here. List the sets by date and area and note the wells in which the catches were stored. The area is given in ICCAT codes. The catch is in short tons of yellowfin (YF), skipjack (SJ), bigeye (BE), mixed, etc. If the tonnage is mixed, note the mixture, e.g., 20 YF + BE. The wells in which the catches were stored are listed under the column headed wells. If the tonnage is divided in many wells, list the tonnage by species in each, if possible.

		Catch				
Date	Area	YF	Mixed	SJ	BE	Wells
7/1/75	6-1-00-000	20	5 YF + SJ	10		P7(5 YF + SJ), S7 (30T)

5. CLASS:

   Enter the size class or carrying capacity in short tons of the catcher vessel.

6. AREA:

   Enter the NMFS area where the sampled catch was made.

7. MIXED/PURE

   Circle one which describes the species composition in the sampled well.

8. DATE OF LANDING:

   Enter the date on which the fish were unloaded from the catcher vessel at the port of landing.

9. WELL:

   Enter the number of the sampled well, e.g., P7 is the seventh well from bow on the port side, S1 is the first well at the bow on the starboard side.

10. COMMENTS:

    Enter all other remarks.

SINGLE SET INFORMATION

1. LATITUDE: LONGITUDE:

   Enter the area in degrees, and minutes if possible, where the sampled set was made.

2. TYPE OF SET:

   Enter the type of set sampled, e.g. porpoise, school, log, etc.

3. MIXED/PURE

   Circle one which describes the species composition of the set sampled.

4. COMMENTS:

Enter all other remarks.

Instructions for completing form LF00R1

Form LF00R1 is a revision of form LF0001 and is used for reporting fork length of yellowfin, skipjack, little tunny, bigeye and albacore tunas. Samples measured from catcher vessels, transshipment vessels or single sets, are recorded on this form.

[Front -- Items 1-13].

1. VESSEL:

   Enter the name of the catcher vessel.

2. TRANSSHIPMENT:

   Enter the name of the transshipment vessel, if applicable.

3. DATE:

   Enter the date of sampling.

4. TONNAGE:

   Enter the total tonnage of catch. Indicate tonnage of yellowfin (YF), tonnage of skipjack (SJ), and tonnage of others (OTHERS). Tonnage should be specified by species. Report tonnage in short tons or specify unit of weight used. If tonnage is unavailable, e.g. for insignificant catches, specify.

5. RANDOM/SELECT:

   Circle the sampling technique used. If SELECT is circled, specify procedure in comment section.

6. HOLD/WELL/SET:

   Circle the sampled unit. Enter the number of the hold if the sample is from a transshipment, the number of the well if

the sample is from a catcher vessel in port or the number of the well and the number of the set (e.g. P7-2) if the sample is from a single set. Holds and wells are numbered from bow to stern, separate numbering for the Port (P) and Starboard (S) wells.

7. MEASURED BY:

Enter the name of the sampler, first and last name.

8. SPECIES:

Enter the name of the target species measured. The name may be abbreviated: SJ=skipjack, YF=yellowfin, BE=bigeye, ALB=albacore, BSJ=black skipjack.

9. SAMPLE NO.:

Enter the sample number. Numbering begins with one for each species and continues sequentially for each year. If single set samples; numbering begins with one for each species, year and vessel.

10. OCEAN:

Enter the name of the ocean in which the fish were caught. ATL. for Atlantic, PAC. for Pacific and IND for Indian Ocean.

11. TIME:

Item 11 is for single set samples only. Enter the set time, i.e., the time that the seine skiff is released.

25-188

Each specimen in the sample is measured and tallied in the appropriate one centimeter length interval. When all of the

specimens have been measured and tallied, enter the total number for each length interval in the spaces provided. Length is in fork length, if otherwise, specify under item 13.

12. TOTAL NO.:

Enter the total number of specimens sampled.

13. COMMENTS:

Enter any remarks about the sampling process such as method of selection, representativeness of sample, etc.

[Back]

Additional information about the sample which is obtained from logbooks, landing receipts, the captain, etc. is recorded on this side of form LF0001. Complete the section which pertains to the type of sample. If HOLD of item 6 is circled, complete TRANSSHIPMENT INFORMATION; if WELL is circled, complete CATCHER VESSEL INFORMATION; if SET is circled, complete SINGLE SET INFORMATION.

TRANSSHIPMENT INFORMATION

1. MANIFEST NO.:

Enter the number of the cargo manifest.

2. PORT OF LANDING:

Enter the name of the port at which the catch was unloaded from the transshipment vessel.

3. PORT TRANSSHIPPED:

Enter the name of the port at which the catch was unloaded from the catcher vessel to the transshipment vessel or from cold stores to the transshipment vessel.

4. CARGO PLAN WEIGHT:

Enter total tonnage of catch from cargo loading plan. Indicate tonnage (in short tons) by species. Specify species in OTHER category. If units other than short tons is used, note the units.

5. MANIFEST WEIGHT:

Enter the catch, in short tons, of yellowfin (YF), skipjack (SJ), other, and total from the reefer manifest. If units other than short tons are used, note here. Specify species in OTHER category.

6. SIZE BREAKDOWN:

If the fish are separated by size during unloading, enter the weight for each size group. The weights are unloading weights in short tons. Note any changes in units. Circle the size groups or group from which the sample was taken.

7. FISH CONDITION:

Enter the condition of the sampled fish, e.g., frozen round, gilled and gutted, etc.

8. DATE OF LANDING:

Enter the date (day, month and year) on which the transshipment vessel unloaded at the port of landing.

9. DATE TRANSSHIPPED:

Enter the date (day, month and year) on which the catch was transshipped from the port transshipped.

10. MIXED/PURE:

Circle mixed or pure which describes the species composition of the sampled unit.

11. FLAG:

Enter the country for which the vessel is fishing.

12. AREA:

Enter the ocean area where the catch was made.

13. GEAR:

Enter the gear (minimum surface longline) used on the vessel to catch fish.

14. SORT TYPE:

Enter the code given in the instructions for Sampling Sorted Fish.

15. SIZE CODE:

Enter the code given in the instructions for Sampling Sorted Fish.

16. COMMENTS:

Enter all additional remarks.

CATCHER VESSEL INFORMATION

1. FLAG:

Check the flag represented by the catcher vessel. If others is checked, enter the name of the country, e.g. _____

others French .

2. MONTH:

Enter the month in which the fish in the sampled well were caught.

3. PORT OF LANDING:

Enter the name of the port at which the sample was taken.

4. SET DISTRIBUTION:

The tonnage, by species, of each set which contributed to the sampled well should be listed here. List the sets by date and area and note the wells in which the catches were stored. The area is given in ICCAT codes. The catch is in short tons of yellowfin (YF), skipjack (SJ), bigeye (BE), mixed, etc. If the tonnage is mixed, note the mixture, e.g., 20 YF + BE. The wells in which the catches were stored are listed under the column headed wells. If the tonnage is divided in many wells, list the tonnage by species in each, if possible.

		Catch				
Date	Area	YF	Mixed	SJ	BE	Wells
7/1/75	6-1-00-000	20	5 YF + SJ	10		P7(5 YF + SJ), S7 (30T)

5. CLASS:

Enter the size class or carrying capacity in short tons of the catcher vessel.

6. AREA:

Enter the NMFS area where the sampled catch was made.

7. MIXED/PURE

Circle one which describes the species composition in the sampled well.

8. DATE OF LANDING:

Enter the date on which the fish were unloaded from the catcher vessel at the port of landing.

9. WELL:

Enter the number of the sampled well, e.g., P7 is the seventh well from bow on the port side, S1 is the first well at the bow on the starboard side.

10. COMMENTS:

Enter all other remarks.

SINGLE SET INFORMATION

1. LATITUDE: LONGITUDE:

Enter the area in degrees, and minutes if possible, where the sampled set was made.

2. TYPE OF SET:

Enter the type of set sampled, e.g. porpoise, school, log, etc.

3. MIXED/PURE

Circle one which describes the species composition of the set sampled.

4. COMMENTS:

Enter all other remarks.

Instructions for completing form LF00R2

Form LF00R2 is a revision of form LF0001 and is used for reporting fork length of yellowfin, skipjack, little tunny, bigeye and albacore tunas. Samples measured from catcher vessels, transshipment vessels or single sets, are recorded on this form.

[Front -- Items 1-13]

1. VESSEL:

   Enter the name of the catcher vessel.

2. TRANSSHIPMENT:

   Enter the name of the transshipment vessel, if applicable.

3. DATE:

   Enter the date of sampling.

4. TONNAGE:

   Enter the total tonnage of catch. Indicate tonnage of yellowfin (YF), tonnage of skipjack (SJ), and tonnage of others (OTHERS). Tonnage should be specified by species. Report tonnage in short tons or specify unit of weight used. If tonnage is unavailable, e.g. for insignificant catches, specify.

5. RANDOM/SELECT:

   Circle the sampling technique used. If SELECT is circled, specify procedure in comment section.

6. HOLD/WELL/SET:

   Circle the sampled unit. Enter the number of the hold if the sample is from a transshipment, the number of the well if

the sample is from a catcher vessel in port or the number of the well and the number of the set (e.g. P7-2) if the sample is from a single set. Holds and wells are numbered from bow to stern, separate numbering for the Port (P) and Starboard (S) wells.

7. MEASURED BY:

Enter the name of the sampler, first and last name.

8. SPECIES:

Enter the name of the target species measured. The name may be abbreviated: SJ=skipjack, YF=yellowfin, BE=bigeye, ALB=albacore, BSJ=black skipjack.

9. SAMPLE NO.:

Enter the sample number. Numbering begins with one for each species and continues sequentially for each year. If single set samples; numbering begins with one for each species, year and vessel.

10. OCEAN:

Enter the name of the ocean in which the fish were caught. ATL. for Atlantic, PAC. for Pacific and IND for Indian Ocean.

11. TIME:

Item 11 is for single set samples only. Enter the set time, i.e., the time that the seine skiff is released.

25-188

Each specimen in the sample is measured and tallied in the appropriate one centimeter length interval. When all of the

specimens have been measured and tallied, enter the total number for each length interval in the spaces provided. Length is in fork length, if otherwise, specify under item 13.

12. TOTAL NO.:

Enter the total number of specimens sampled.

13. COMMENTS:

Enter any remarks about the sampling process such as method of selection, representativeness of sample, etc.

[Back]

Additional information about the sample which is obtained from logbooks, landing receipts, the captain, etc. is recorded on this side of form LFOOR2. Complete the section which pertains to the type of sample. If HATCH of item 6 is circled, complete TRANSSHIPMENT INFORMATION; if WELL is circled, complete CATCHER VESSEL INFORMATION; if SET is circled, complete SINGLE SET INFORMATION.

TRANSSHIPMENT INFORMATION

1. MANIFEST NO.:

Enter the number of the cargo manifest.

2. PORT OF LANDING:

Enter the name of the port at which the catch was unloaded from the transshipment vessel.

3. PORT TRANSSHIPPED:

Enter the name of the port at which the catch was unloaded from the catcher vessel to the transshipment vessel or from cold stores to the transshipment vessel.

4. CARGO PLAN WEIGHT:

   Enter total tonnage of catch from cargo loading plan. Indicate tonnage (in short tons) by species. Specify species in OTHER category. If units other than short tons is used, note the units.

5. MANIFEST WEIGHT:

   Enter the catch, in short tons, of yellowfin (YF), skipjack (SJ), other, and total from the reefer manifest. If units other than short tons are used, note here. Specify species in OTHER category.

6. SIZE BREAKDOWN:

   If the fish are separated by size during unloading, enter the weight for each size group. The weights are unloading weights in short tons. Note any changes in units. Circle the size groups or group from which the sample was taken.

7. FISH CONDITION:

   Enter the condition of the sampled fish, e.g., frozen round, gilled and gutted, etc.

8. DATE OF LANDING:

   Enter the date (day, month and year) on which the transshipment vessel unloaded at the port of landing.

9. DATE TRANSSHIPPED:

   Enter the date (day, month and year) on which the catch was transshipped from the port transshipped.

10. MIXED/PURE:

Circle mixed or pure which describes the species composition of the sampled unit.

11. FLAG:

Enter the country for which the vessel is fishing.

12. GEAR:

Enter the gear (minimum surface longline) used on the vessel to catch fish.

13. AREA:

Enter the ocean area where the catch was made.

14. SORT TYPE:

Enter the code given in the instructions for Sampling Sorted Fish.

15. SIZE CODE:

Enter the code given in the instructions for Sampling Sorted Fish.

16. COMMENTS:

Enter all additional remarks.

CATCHER VESSEL INFORMATION

1. FLAG:

Check the flag represented by the catcher vessel. If others is checked, enter the name of the country, e.g. _____ others French .

2. MONTH:

Enter the month in which the fish in the sampled well were caught.

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9. WELL:

Enter the number of the sampled well, e.g., P7 is the seventh well from bow on the port side, S1 is the first well at the bow on the starboard side.

10. COMMENTS:

Enter all other remarks.

SINGLE SET INFORMATION

1. LATITUDE: LONGITUDE:

Enter the area in degrees, and minutes if possible, where the sampled set was made.

2. TYPE OF SET:

Enter the type of set sampled, e.g. porpoise, school, log, etc.

3. MIXED/PURE

Circle one which describes the species composition of the set sampled.

4. COMMENTS:

Enter all other remarks.

Instructions for Completing Form LF0002

Form LF0002 is used to report the species composition of a catch that contains one or more misclassified species. Samples obtained from catcher vessels, transshipment vessels or single sets, may be recorded on this form. All fish counted in the composition sample should be measured for length so that the reported catch in weight may be subdivided into catch by species.

Reporter:

Enter the name of the sampler, first and last name.

Species:

Enter the name of the target species that was sampled. The name may be abbreviated: SJ=Skipjack, YF=Yellowfin, BE=Bigeye, BSJ=Black skipjack, BF=Bluefin, ALB=Albacore.

Sample #:

Enter the number of the sample. Samples start at one and continue sequentially for each species.

Date:

Enter the date (day, month and year) of sampling.

Reported from:

Enter the port of sampling

Catcher Vessel:

Enter the name of the catcher vessel.

Gear:

Enter the type of gear, e.g., purse seine, trap, etc.

Flag:

Enter the flag or country for whom the catcher vessel is fishing.

Date of Catch:

Enter the date of catch.

Area:

Enter the location of the catch. Report latitutde and longitude when possible, otherwise enter NMFS area.

Transshipment Vessel:

If the sample is taken from a transshipment enter the name of the transshipment vessel.

Hold/Well/Set:

Circle the storage source of the sample. Enter the hold number if the sample is from a transshipment, the well number if the sample is from a catcher vessel in port, or the set number and well number if the sample is from a single set.

Sort Type:

Enter code as in instructions for Sampling Sorted Fish.

Size Code:

Enter code as in instructions for Sampling Sorted Fish.

Unloading Weight (S/T):

Enter the unloading weights in short tons of the catch in the hold, well or set for total, yellowfin (YF), skipjack (SJ) and other. For other, specify species when possible.

Species, Number of fish, frequency sample number, biological sample number:

List the number of fish of each species in the composition sample. Enter the total number of fish sampled. For each species, with

more than 15 fish in the sample, length measurements should be recorded on form LF0001 and the sample number recorded here. For species with less than 15 fish, enter sizes in the margin to the right.

Comments:

Enter any comments concerning the catch and sample.

INSTRUCTIONS FOR
BIOLOGICAL SAMPLE FORM LF0003

This form will be used to record the length-weight relation and the species identification for tunas and billfish classified by sex, area of capture and time of capture.

1. Write with a soft (#2) pencil with a sharp point or use a typewriter to record the coded information. Make sure all erasures are clean and that the coded information is readily legible.

2. When entering information, all numbers and number codes must be right justified. Unused spaces to the left of the number in any item may be left blank.

3. For each sample, there will be as many records as fish sampled. For each series of fish measured in a particular sample, the information under the headings SAMPLE INFORMATION and CAPTURE INFORMATION will be the same.

4. If more than one page is required for a particular sample, the same sample and capture information must be recorded on the additional sheets.

5. Pertinent remarks may be added in the space provided on the back of each form.

6. When filling out the form:

   A. Make sure each fish has a distinctive number. This will not be punched onto the card, but will serve to reference the fish if questions arise as to the value of some entry for that fish.

   B. Refer to the coding format sheet when filling out the form. Each element of information required is referenced by a title and the column interval where it is to be entered. The beginning column for each element of information is marked on the form for each title.

   C. Whenever possible, obtain the flag country of the catcher vessel; the gear (purse seine, baitboat, longline, etc.) used to capture the sample; the transshipment vessel, and the deck/hatch/well the sample was taken from.

   D. When determining the type of sample (column 4 under SAMPLE INFORMATION) note in the remarks whether the sample was a random one or if it was from a select group as "all large fish" or "from a sample of large fish being tested for mercury content." If the sample was obtained from another source than yourself, note it in the remarks section.

CODING FORMAT FOR BIOLOGICAL SAMPLE FORM

Column No.	Title	Type of Entry	Description
		SAMPLE INFORMATION	
1-3	Sample #	Number	Each year will have a sample number beginning with 1 and increasing sequentially through the year.
4	Type	Number code	Used to determine if the sample was random or from a select group (see instruction sheet, paragraph 6.0). Code Format: 1 = Random Sample 2 = Selected
5-6	Month	Number Code	Month the sample was taken. Code Format: 1 = Jan. 7 = July 2 = Feb. 8 = Aug. 3 = Mar. 9 = Sept. 4 = Apr. 10 = Oct. 5 = May 11 = Nov. 6 = Jun. 12 = Dec.
7-8	Day	Number	Day the sample was taken.
9-12	Year	Number	Year in which the sample was taken.
		CAPTURE INFORMATION	
13-14	Area	Number Code	Area the sample was captured from. Code Format: 0 = Eastern Atlantic 1 = North-West Atlantic (U.S. East Coast) 2 = Mid-West Atlantic 3 = South-West Atlantic 4 = Gulf of Mexico 5 = Western Atlantic 6 = Atlantic 7 = NMFS Area 51 8 = NMFS Area 52 9 = NMFS Area 53 10 = NMFS Area 54 11 = NMFS Area 55 12 = ICCAT Area 1 13 = ICCAT Area 2 14 = ICCAT Area 3

15	Quarter	Number Code	Quarter of the year in which the fish were captured. Code Format: 1 = Jan. to Mar. 2 = Apr. to Jun. 3 = July to Sept. 4 = Oct. to Dec.
16-17	Month	Number Code	Month of the year in which the fish were captured. Code Format: Same as for columns 7-8
18-21	Year	Number	Year in which the fish were captured.
23-24	Gear	Number Code	Type of gear used to capture the specimen, if known. Code Format: 1 = Longline 5 = Baitboat 6 = Purse seine 9 = Trolling 10 = Traps 11 = Surface, exact type of surface gear not known 12 = Sport 13 = Unspecified 14 = Trawl

Columns 25-28 left blank

29-30	Positive ID	Number Code	True species identity as determined by the most accurate method that was attempted. This will be the same code as the liver ID if the liver ID was taken or would be the same as the external ID if only that was taken. Code Format: 1 = Bluefin tuna 2 = Southern Bluefin 3 = Yellowfin tuna 4 = Albacore 5 = Bigeye tuna 6 = Blackfin tuna 7 = Atlantic little tuna 8 = Skipjack 9 = Atlantic Bonito 10 = Frigate Mackerel 11 = Bullet Mackerel 12 = Wahoo 13 = Spotted Spanish Mackerel 14 = King Mackerel 15 = Atlantic Sailfish 16 = Black Marlin

Columns 29-30 (Continued)

17 = Atlantic Blue Marlin
18 = Atlantic White Marlin
19 = Broadbill Swordfish
20 = Rainbow runner
21 = Other
22 = Marlin
23 = Young

31-32	External ID	Number Code	Species identity as determined from examination of external characteristics. Code Format: Same as for Positive ID.
33	Other ID	Number Code	Flag code to specify if an identity other than the usual external ID was attempted. Code Format blank = No liver or parasite ID taken 1 = Liver ID only taken 2 = Parasite ID only taken 3 = Both liver and parasite ID taken.
34-36	Length	Number	Length of the specimen to the nearest centimeter.
37	Weight type	Number Code	Flag to specify if the weight in columns 28-32 was taken in English (pounds) or metric (kilograms) units. Code Format: 1 = Weight in pounds 2 = Weight in kilograms Weight is to be taken to the nearest 0.5 pounds or 0.25 kilograms
38-42	Weight quantity	Number	Weight of the specimen to the nearest 0.5 pound or the nearest 0.25 kilogram.
43	Sex	Number Code	Coded value to specify the sex of the specimen as determined by examination of the gonads. Code Format: 1 = Male 2 = Female

44-45	Liver ID	Number Code	Species identity as determined by examination of the liver. Code Format: Blank = None taken Others = Same as positive ID format
46-47	Parasite ID	Number Code	Species identity as determined by examination of the parasites of the nasal cavity. Code Format: Blank = None taken Others = Same as positive ID format

1. VESSEL: A.K. Strom 5. RANDOM / (SELECT) 8. SPECIES: YF 9. SAMPLE NO: 5

2. TRANSSHIPMENT: Marco Polo 6. (HOLD) WELL / SET: # 2 10. OCEAN: ATL.

3. DATE: 9/13/74 7. MEASURED BY: Eugene Nakagaki 11. TIME: —

4. TONNAGE: TOTAL 897.34 YF 514.02 SJ 382.30 OTHERS 1.01 bullets

25		66		107		148	
26		67 //	2	108		149	
27		68 //	2	109		150	
28		69 //	2	110		151	
29		70		111		152	
30		71		112		153	
31		72		113		154	
32		73 /	1	114		155	
33		74		115		156	
34		75		116		157	
35		76 ////	4	117		158	
36		77		118		159	
37		78 /	1	119		160	
38		79 ///	3	120		161	
39		80 /	1	121		162	
40		81		122		163	
41 /	1	82		123			
42		83 /	1	124			
43		84 /	1	125			
44		85		126			
		86 //	2	127			
46		87					
47		88					
48		89					
49		90					
50		91					
51		[illegible]				174	
52		[illegible]				175	
53		[illegible]				176	
54 /	1	[illegible]				177	
55 ///	3	[illegible]				178	
56		[illegible]		138		179	
57 ////	5	98		139		180	
58 ////	4	99		140		181	
59 ///	3	100		141		182	
60		101		142		183	
61 ////	5	102		143		184	
62 //	2	103		144		185	
63		104		145		186	
64 ///	3	105		146		187	
65 ///	3	106		147		188	

12. TOTAL NO.: 50

13. COMMENTS: Some fish with broken tails, the tails were replaced/spare and then measured.

LF 0001

17

1. VESSEL: A.K. Sloan 5. RANDOM / (SELECT) 8. SPECIES: YF 9. SAMPLE NO: 5

2. TRANSSHIPMENT: Macco Polo 6. (HOLD) WELL / SET: # 2 10. OCEAN: ATL.

3. DATE: 9/13/11 7. MEASURED BY: Eugene Malaspina 11. TIME: —

4. TONNAGE: TOTAL 522.34 YF 514.02 SJ 382.30 OTHERS 1.01 bullets

25		66		107		148	
26		67 II	2	108		149	
27		68 II	2	109		150	
28		69 II	2	110		151	
29		70		111		152	
30		71		112		153	
31		72		113		154	
32		73 I	1	114		155	
33		74		115		156	
34		75		116		157	
35		76 IIII	4	117		158	
36		77		118		159	
37		78 I	1	119		160	
38		79 III	3	120		161	
39		80 I	1	121		162	
40		81		122		163	
41 I	1	82		123			
42		83 I	1	124			
43		84 I	1	125			
44		85		126			
		86 II	2	127			
46		87					
47		88					
48		89					
49		90					
50		91					
51		92				174	
52						175	
53						176	
54 I	1					177	
55 III	3					178	
56				138		179	
57 IIII	5	98		139		180	
58 IIII	4	99		140		181	
59 III	3	100		141		182	
60		101		142		183	
61 IIII	5	102		143		184	
62 II	2	103		144		185	
63		104		145		186	
64 III	3	105		146		187	
65 III	3	106		147		188	

12. TOTAL NO.: 50

13. COMMENTS: Some fish with broken tails, the tails were replaced/covered and then measured.

LF 0081

1. VESSEL:_____ 5. RANDOM / SELECT 8. SPECIES:_____ 9. SAMPLE NO:_____

2. TRANSSHIPMENT:_____ 6. (HAUL) / WELL / SET:_____ 10. OCEAN:_____

3. DATE:_____ 7. MEASURED BY:_____ 11. TIME:_____

4. TONNAGE: TOTAL_____ YF_____ SJ_____ OTHERS_____

25	66	107	148
26	67	108	149
27	68	109	150
28	69	110	151
29	70	111	152
30	71	112	153
31	72	113	154
32	73	114	155
33	74	115	156
34	75	116	157
35	76	117	158
36	77	118	159
37	78	119	160
38	79	120	161
39	80	121	
40	81	122	
41	82		
42	83		
43	84		
44	85		
	86		
46	87		
47	88		
48	89		171
49	90		172
50	91		173
51	92	133	174
52	93	134	175
53	94	135	176
54	95	136	177
55	96	137	178
56	97	138	179
57	98	139	180
58	99	140	181
59	100	141	182
60	101	142	183
61	102	143	184
62	103	144	185
63	104	145	186
64	105	146	187
65	106	147	188

EXAMPLE

12. TOTAL NO.:_____

13. COMMENTS:_____

LF 0087

SPECIES COMPOSITION

Reporter:_____ Species:_____ Sample #:_____

Date:_____ Reported from:_____

Catcher Vessel:_____ Gear:_____

Flag:_____ Date of catch:_____ Area:_____

Transshipment Vessel:_____

Hatch/Well/Set:_____ Sort Type:_____

Unloading Weight (S/T): Size Code:_____

Total:_____ YF:_____ SJ:_____

Other:_____

Species	Number of fish	Freq. Sample Number	Biolo. Sample Number
Yellowfin			
Skipjack			
Bigeye			
Albacore			
Bluefin			
Blk. Skipjack			
Others			
UNK.(YE/BE)			
Total			

Comments:_____

BIOLOGICAL SAMPLE FORM

CATCHER VESSEL: _____ FLAG: _____ PAGE ____ OF ____

TRANSHIPPMENT VESSEL: _____ HATCH/WELL/SET: _____

LENGTH-FREQUENCY #: _____

SAMPLE INFORMATION

SAMPLE NUMBER	TYPE	DATE MEASURED		
		MONTH	DAY	YEAR
1	4	5	7	9

CAPTURE INFORMATION

AREA	TIME OF CAPTURE			GEAR
	QUARTER	MONTH	YEAR	
13	15	16	18	22

FISH	POSITIVE ID	EXTERNAL ID	OTHER ID	LENGTH (cm)	WEIGHT		SEX	PARASITE ID	LIVER ID
					TYPE	QUANTITY			
	29	31	33	34	37	38	43	44	46

LF0003

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SAMPLING PROGRESS REPORT

DATE: From _____ to _____ Page: _____ of _____

REPORTED BY: _____ LOCATION: _____

VESSELS SAMPLED:

	DATE	SAMPLES		SPECIES	CATCHER VESSEL	TRANSSHIPMENT VESSEL	DATE OF CATCH	AR C CAT
		LENGTH	COMPOSITION					
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
2								
13								
4								
5								

mments: _____

AREA/ TIME STRATA SAMPLED

Species: _____ Sampling port: _____ Date: _____

Year: _____ Sampled by: _____

MONTH	NMFS AREA		
	51	52	53
January			
February			
March			
April			
May			
June			
July			
August			
September			
October			
November			
December			
TOTAL			

LF0005

SUMMARY OF U. S. VESSELS FISHING IN THE ATLANTIC

YEAR: _____ DATE COMPLETED: _____

Vessel Name	Puerto Rico		Catch in short tons			
	Dep.	Arr.	Y.F	S.J.	B.F.	OTHER

58

this was cut off in the original scanned document LF0006 ?

LF0006

YEAR:

VESSEL AREA/TIME STRATA TABLE

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	AREA 51												AREA 52												AREA 53											
VESSEL	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D

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