



NOAA Technical Memorandum  
NMFS-SEFSC-407

## LARGE PELAGIC LOGBOOK NEWSLETTER - 1996



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U.S. DEPARTMENT OF COMMERCE  
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National Marine Fisheries Service  
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January 1998

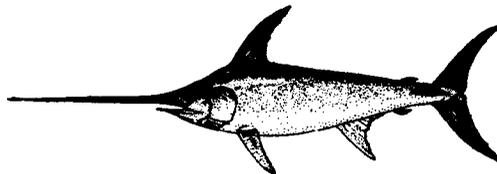


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**LARGE PELAGIC LOGBOOK NEWSLETTER - 1996**

by

**Jean Cramer and Heather Adams**



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January 1998

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This is the seventh annual Large Pelagic Logbook Newsletter. The primary purpose of this report is to summarize data and activities related to the mandatory large pelagics logbook and observer programs. This newsletter serves as a vehicle for dissemination of information to those directly involved in the fishery. In addition to updating catch, effort, CPUE, and location information, and detailing revisions to logbook reporting in 1998, this year's newsletter includes sections pertaining to swordfish, yellowfin, bigeye and albacore stock status, bycatch, mandatory dealer reporting, the longline observer program, and other related studies.

Comments and suggestions are invited; see section "WHOM TO CONTACT FOR WHAT."

### COMPARISON OF 1994 - 1996 LOGBOOK CATCH AND EFFORT DATA

Nine summary tables are included in this newsletter. The numbers of swordfish, tunas, and billfish reported caught, by area, for 1994, 1995 and 1996 (preliminary) are given for longline (Tables 1a-1c) and gillnet (Tables 2a-2c). Longline effort is reported in hooks and numbers of boats, gillnet and pairtrawl effort is reported in sets and numbers of boats. The longline boat statistics are from logbook reports that were considered to represent all pelagic longline sets including summary records; bottom longline records were excluded. Exclusion of longline records does not exclude all set targeting species other than swordfish and tuna.

The gillnet statistics represent all sets that reported fishing this gear type. Some changes in the tabulated data for earlier years and reported previously were due to additional revisions in the database.

Locations of areas are shown in Figure 1. Definitions are as follows: area 1 - Caribbean<sup>1</sup> (CAR), area 2 - Gulf of Mexico (GOM), area 3 - Florida East Coast<sup>1</sup> (FEC), area 4 - South Atlantic Bight<sup>1</sup> (SAB), area 5 - Mid Atlantic Bight<sup>1</sup> (MAB), area 6 - Northeast Coastal<sup>1</sup> (NEC), area 7 - Northeast Distant<sup>1</sup> (NED), area 8 - Sargasso<sup>1</sup> (SAR), area 9 - North Central Atlantic<sup>1</sup> (NCA), area

10 - Tuna North<sup>1</sup> - (TUN), and area 11 - Tuna South<sup>1</sup> (TUS).

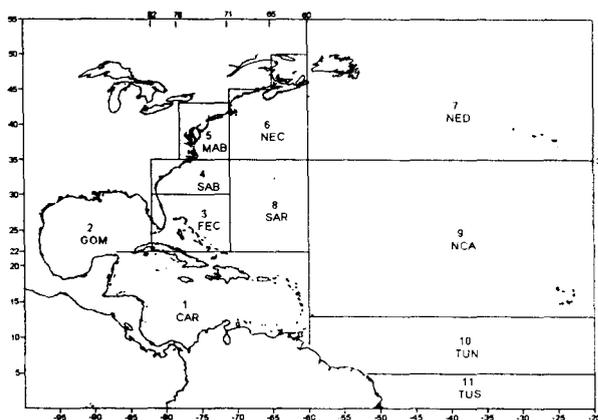


Figure 1. Map designating the eleven areas used in analysis of the swordfish logbook data.

Between 1995 and 1996 reported longline effort (hooks) decreased by 33% in the NED and decreased by over 50% in the MAB and NCA. Reported effort increased by half in the SAB and more than tripled in the SAR. Effort increased greatly in TUS as the number of boats reporting fishing in the area went from one in 1995 to eight in 1996.

Preliminary reported longline effort for 1996 was slightly higher than reported for 1995. The total number of longline boats decreased in 1996 from the levels reported in 1994 and 1995.

The reported yellowfin tuna catch for the three-year period was approximately 70,000, 83,000, and 62,000 fish, respectively. This represents a 25% decrease in numbers of reported yellowfin catch from 1995 to 1996.

In the GOM, the reported catch of yellowfin in numbers increased annually from 1990 through 1992; this trend has reversed from 1992 to 1996. In the MAB, the reported yellowfin catch in numbers increased annually from 1992 through 1995, but this trend has reversed in 1996.

<sup>1</sup>These are arbitrary areas and do not constitute official geographic areas.

In 1994 there were approximately 104,000 swordfish tabulated from longline records (caught = kept + discarded). There were approximately 103,000 swordfish reported in 1995; and 95,000 reported in 1996 (preliminary). The corresponding reported fishing effort for the three years was roughly 8.9, 10.0, and 10.2 million hooks, respectively (Tables 1a-1c). Reported swordfish catch was similar in 1994 and 1995, but declined in 1996. The number of reported hooks fished increased by 2%, in 1996 compared to 1995.

With the exception of the GOM and SAR, near shore areas (Figure 1), reported decreases in annual swordfish catch by longline boats. Swordfish catch in the NED and NCA also decreased in 1996. Other offshore areas reported increased swordfish catch.

The number of yellowfin tuna and swordfish reported caught by gillnet boats decreased from 1994 (1,042 swordfish and 292 yellowfin) to 1995 (1,007 swordfish and 141 yellowfin) to 1996 (880 swordfish and 64 yellowfin) (Tables 2a-2c).

#### ***REPORTED FISHING LOCATIONS IN 1994, 1995, AND 1996***

The location of reported commercial pelagic fishing effort by year for 1994-1996 is shown in Figures 2-4. The general pattern for reported sets is similar across the three years along the U.S. coastline. Fishing effort increased and expanded geographically in the southern offshore areas (NCA, TUN, and TUS).

#### ***CPUE DATA***

Tables 3a-3c represent 1994, 1995, and 1996 (preliminary) data, respectively, for swordfish and yellowfin tuna. These data are yearly totals, by areas as (defined in Figure 1) for: number of fish Kept; number Discarded dead and Discarded alive; Kept+Discarded; effort in HOOKS; the Number of sets; and the average of the individual catch rates, AV(C/E) (equivalent to average CPUE). This

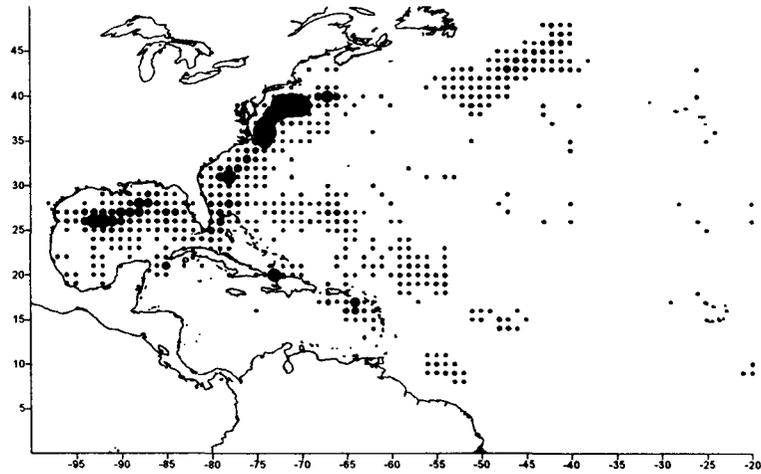
summary includes all gears that reported fishing with hooks that were not thought to be summary records. As such, this would include effort directed at species other than swordfish or tunas.

The totals reported in Tables 1a through 1c are different from the totals in tables 3a through 3c because different criteria were used in selecting the records to be used. Tables 1a through 1c represent data from longline boats only, including summary reports filed by longline boats. Tables 3a through 3c represent all records that reported hooks except summary reports. Gears represented include, but are not limited to, longline, bottom longline, and rod and reel boats.

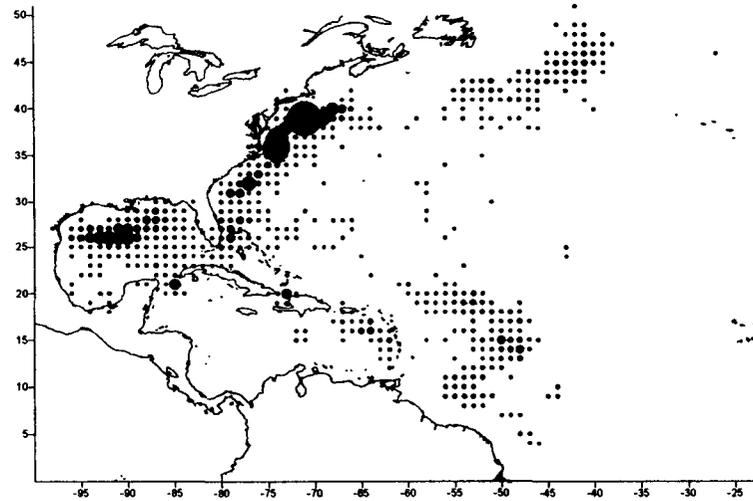
The data summarized here are considered to represent nominal CPUE. No attempt has been made in this summary to standardize the data for factors not related to fish abundance, but known to affect the CPUE values. Those analyses are carried out for the purpose of stock assessments, and are reported elsewhere.

The reported swordfish catch rates in 1994 for the CAR, FEC, SAB, NED and the NCA were, respectively, approximately 2.7 fish/100 hooks, 2.8 fish/100 hooks, 2.0 fish/100 hooks, 2.6 fish/100 hooks and 1.9 fish/100 hooks (Table 3a); in 1995 approximately 2.3 fish/100 hooks, 2.4 fish/100 hooks, 1.3 fish/100 hooks, 2.8 fish/100 hooks and 1.9 fish/100 hooks (Table 3b); and in 1996 (preliminary) approximately 2.0 fish/100 hooks, 2.6 fish/100 hooks, 1.2 fish/100 hooks, 2.5 fish/100 hooks and 1.3 fish/100 hooks (Table 3c). The best reported 1996 swordfish catch rates in an offshore area were in the TUS (2.5 fish/100 hooks).

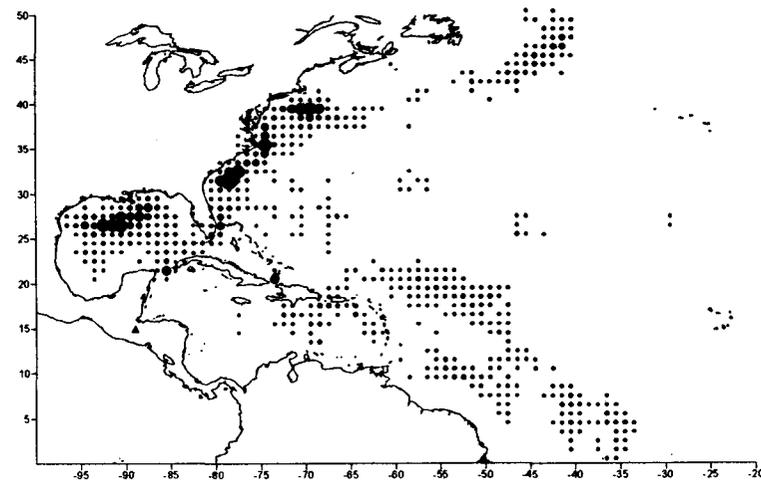
Average reported CPUEs for yellowfin, on an annual basis, have been consistently high from the GOM fishery until 1996. The reported catch rates in the GOM in 1994 were approximately 2.7 fish/100 hooks (Table 3a); in 1995 approximately 2.7 fish/100 hooks (Table 3b); and in 1996 approximately 0.8 fish/100 hooks (Table 3c). The highest CPUE reported for 1996 was 2.7 fish/100 hooks in the MAB.



*Figure 2. Location and density of reported longline effort in 1994.*



*Figure 3. Location and density of reported longline effort in 1995.*



*Figure 4. Location and density of reported longline effort in 1996.*

Monthly reported CPUEs for swordfish, yellowfin, bigeye, and albacore from 1987 to 1996 are shown in Figures 5a -5d. The error bars represent  $\pm 2$  standard deviations from the mean.

### ***NUMBERS OF PERMITTED VESSELS***

A compilation of activity related to the vessels permitted during the period 1987 through 1996 is presented in Table 8. "Fished" implies a vessel submitted at least one positive fishing report during that year, "Caught Swordfish" means the vessel reported catching at least one swordfish during that year and "Caught Swordfish in 5 months" means the vessel reported catching at least one swordfish per month in at least five months of that year. "Hooks Reported" includes all submitted logbooks whether or not they represented single pelagic longline sets, summary records, bottom longline records, or sets with less than 100 hooks fished. For this reason, these numbers are higher than the numbers in Tables 1a-1c.

### ***SWORDFISH STOCK STATUS***

In 1996, the status of the North Atlantic swordfish resource was assessed by ICCAT using both non-equilibrium stock production models and virtual population analyses (VPA) based on catch and CPUE data through 1995. No new Atlantic stock assessment was conducted in 1997. In 1997 updated North and South Atlantic CPUE data were examined and show similar trends as those in recent years. The current base case assessments indicate that the North Atlantic swordfish resource has continued to decline despite reductions in total reported North Atlantic landings from peak values in 1987. Although some fleets have reduced catch levels and partial fishing mortality rates, the status of the resource continued to decline because recent landings have exceeded surplus production. The decline in stock size is reflected in declining CPUE's for several fisheries. An updated estimate of maximum sustainable yield from production model analyses is 28.6 million lbs (13,000 MT) whole wt (with an 80% confidence range from 11.7 to 36.3 million lbs. whole wt). Since 1982, only in one year (1984) have north Atlantic swordfish

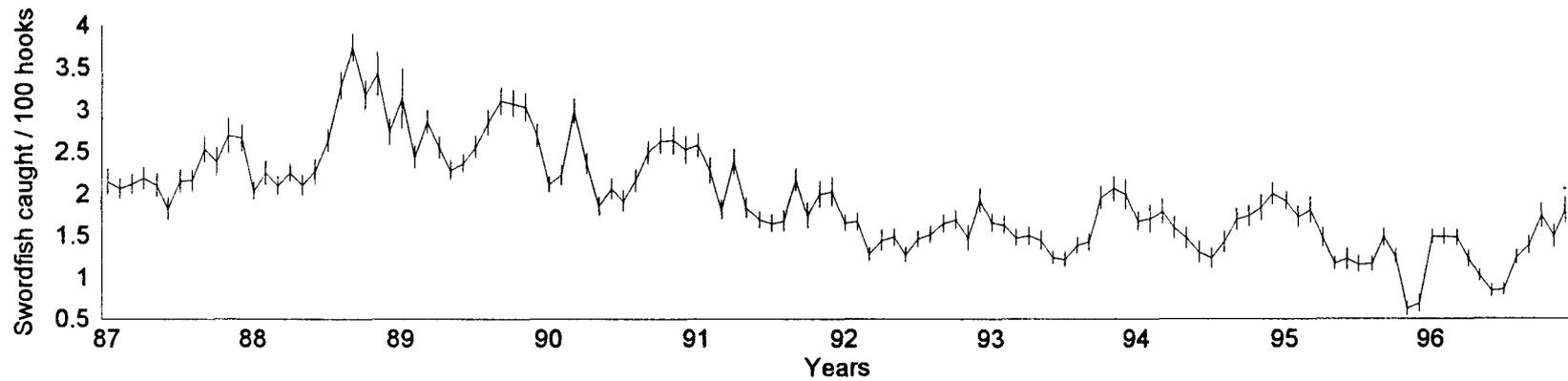
catches been less than 28.6 million lbs; preliminary estimates of catches in 1995 were about 37.2 million lbs. (16,900 MT).

A summary of the resource status as estimated by the 1997 ICCAT is shown in the Table 4. In the North Atlantic, ICCAT estimated that at the beginning of 1996, the exploitable swordfish biomass was about 58% of the level needed to produce MSY (80% confidence intervals ranged from 41-104%). Furthermore, the estimates of fishing mortality rates for 1995 were estimated to be 2.05 times the fishing mortality rate at MSY. ICCAT estimated that catches in 1995 and anticipated landings in 1996, were too high to prevent further declines in the North Atlantic swordfish resource status.

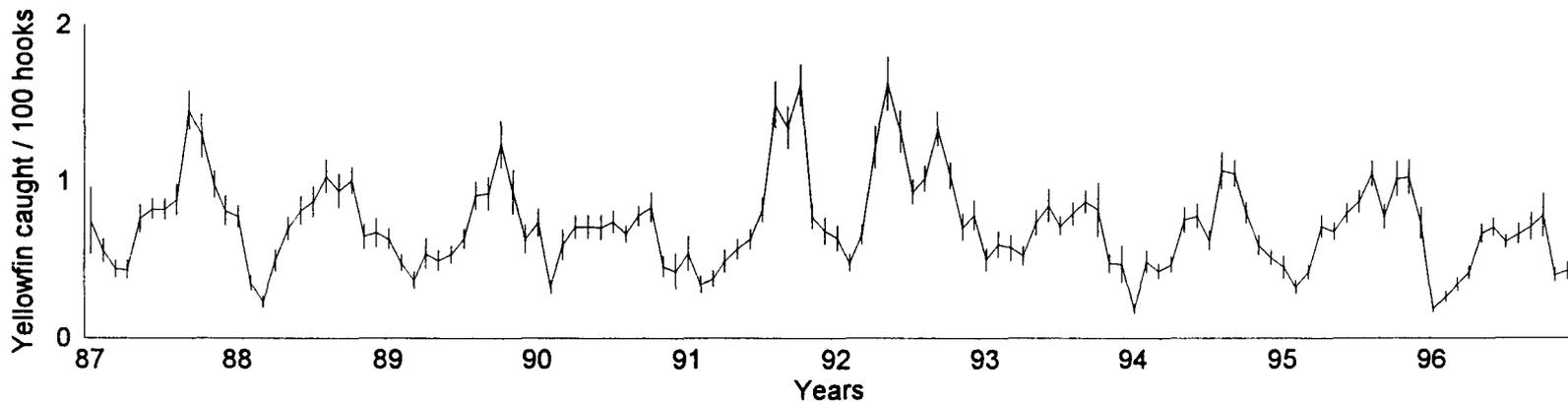
A quantitative assessment for the South Atlantic stock assumption was conducted for the first time in 1996. Biomass at the beginning of 1996 was estimated to be 99% of the biomass needed to produce MSY, the 1995 fishing mortality rate was estimated to be 1.24 times the fishing mortality rate at MSY, and the surplus production for 1996 was estimated to be about 14,600 MT. Reported landings in 1995 (about 20,600 MT) and 1996, preliminary, (about 17,600 MT) have exceeded this level. These analyses indicate that current levels of harvest are not sustainable: thus it is likely that the stock will decline further.

### ***ALBACORE STOCK STATUS***

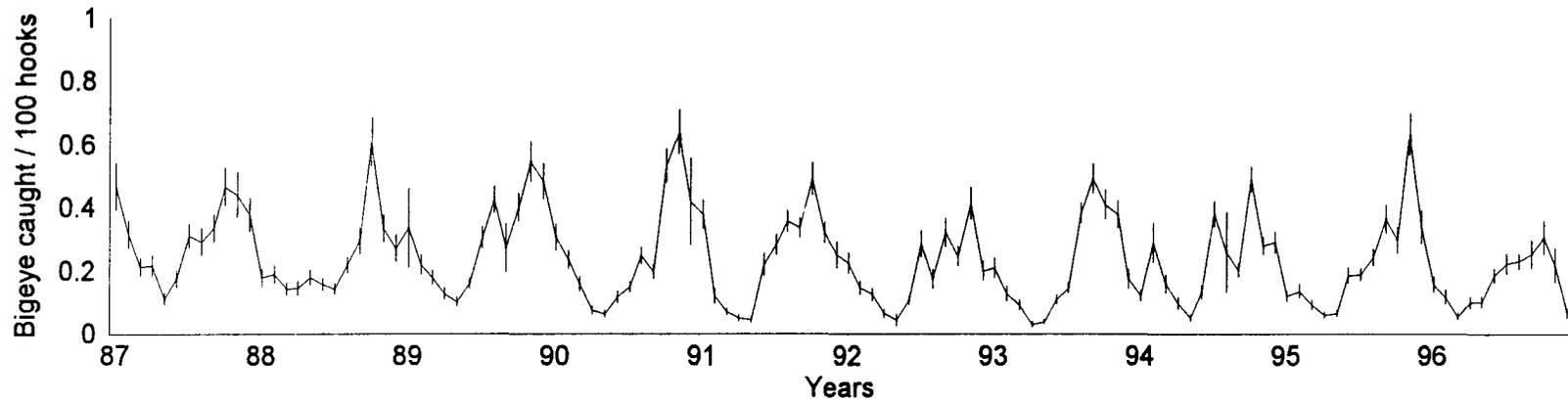
Equilibrium yield per recruit and spawning potential ratio analysis made by the SCRS in 1996 indicated that the northern stock is at or near full exploitation (Table 5). Assuming the fishing mortality rate as estimated by the VPA for 1995, the analysis reflects the current  $F_{1995}(0.702)$  close to  $F_{max}(0.880)$  and greater than  $F_{0.1}(0.375)$ . Assuming current  $F$  for older ages is closer to the level estimated for 1990-1992, then current  $F$  would be closer to  $F_{0.1}$ . The current level of spawning biomass for these analyses is estimated as 16.5% and 20% of the unexploited level respectively. ICCAT concluded that the stock is near full



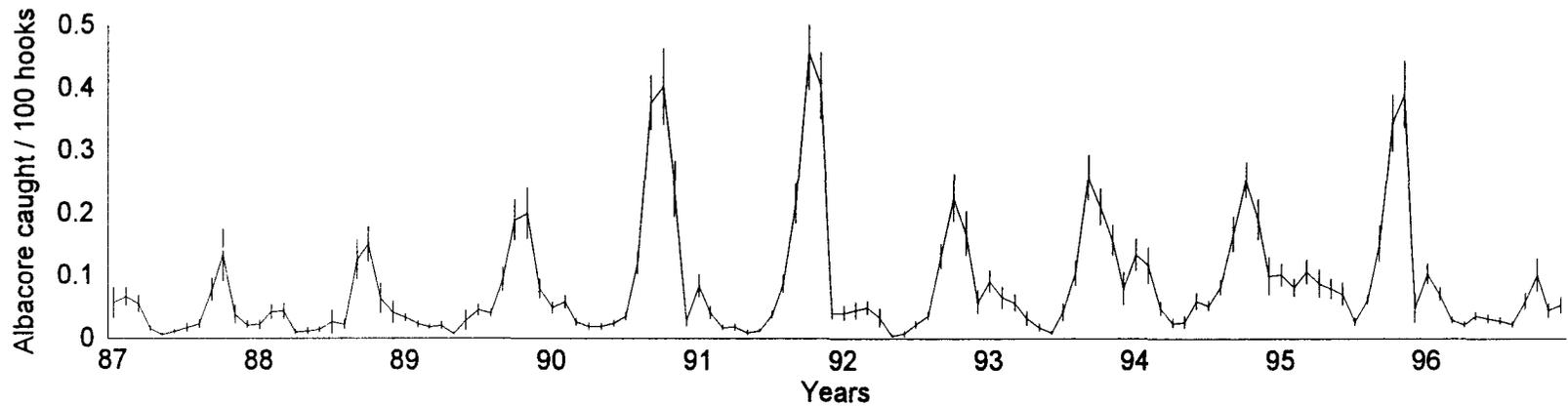
**Figure 5a. Monthly Swordfish CPUE's  
1987 -1996**



**Figure 5b. Monthly Yellowfin CPUE's  
1987 -1996**



**Figure 5c. Monthly Bigeye CPUE's  
1987 -1996**



**Figure 5d. Monthly Albacore CPUE's  
1987 -1996**

exploitation and that fishing mortality should not be increased above its current level..

An age structured production model was used for assessment of South Atlantic albacore abundance. The assessment indicated that MSY is about 58.5 million lbs (26,600 MT) and the current (1995) replacement yield is 58.3 million lbs (26,500 MT). The estimate of the ratio of current biomass to that at which MSY is achieved is 0.78. The fishing mortality rate is 116% of that needed to achieve MSY (Table 5). ICCAT has recommended limiting catches of South Atlantic albacore to 90% of the 1989-1993 levels.

### ***BIGEYE STOCK STATUS***

Assesment of bigeye stock status was updated in 1997. Since 1993, total Atlantic bigeye catch has been larger than 198 million lbs (90,000 MT), an increase from the 1989-1990 level of more than 66 million lbs (30,000 MT). This increase was due primarily to increases in catch by purse seine of small fish and longline fisheries of large fish. The MSYs estimated by the production models and the VPA were much smaller than the current catch of 154-198 million lbs (70-90,0000 MT). Although MSY levels were not well determined, it is highly likely that the current catch level cannot be sustained in the long term and current catches may lead to a large reduction in recruitment. Reduction of the total catch to at least the 1991-1992 catch levels of 187 million lbs (85,000 MT) was recommended by ICCAT (Table 6).

Further increases in the catch of small fish, that recently occurred due to intensive fishing on schools associated with floating objects by the surface fisheries, will result in a decrease in catch over the long term as well as an increased likelihood of recruitment over-fishing.

### ***YELLOWFIN STOCK STATUS***

In 1994, the status of the total Atlantic yellowfin stock was assessed by ICCAT using equilibrium and non-equilibrium production models. In 1997 and 1996, ICCAT applied only an

equilibrium model to updated data and the 1994 VPA was projected forward using recent catch data. The 1994, 1995, and 1996 analyses all indicate that the stock of Atlantic yellowfin is at a level close to full exploitation (Table 7). ICCAT concluded these analyses imply that any increase in effort is likely to result in a fishing mortality rate that exceeds the level corresponding to MSY and a stock biomass below the minimum level that can support MSY.

ICCAT recommended restricting fishing mortality to 1992 levels and finding effective ways to reduce mortality on small yellowfin.

### ***MANDATORY REPORTING IN THE ATLANTIC LARGE PELAGIC FISHERY***

Federal regulations require that both fishermen and dealers assist the conservation and management of large pelagic species by providing statistics on fishing activity and seafood production respectively. Fishermen are required to submit data on daily fishing activity and catch, which includes individual carcass weights for the swordfish and other large pelagic species. Dealers are required to provide summary data on the landings (purchases) by market or size category and the price or value for the respective categories. Both fishermen and dealers are required to maintain an active Federal permit to fish for or purchase swordfish.

#### ***Fishermen Reporting.***

All fishermen that fish for and land swordfish are required to have an active permit and report the catches from every set or daily trip. In addition to a completed logbook sheet for every set, fishermen are required to submit a copy of the weigh-out or sales receipt that provide the weights for the individual swordfish and other large pelagic species that are caught on the fishing trip. If either of these requirements are not met, the vessel is not in compliance and the vessel's permit can be revoked or denied at the annual renewal.

If the vessel did not fish during a calendar month, a "no-fishing" report must be submitted.

All logbook reports and weigh-outs are to be submitted to the

Southeast Fisheries Science Center  
Logbook Program  
P.O. Box 491740  
Key Biscayne, Florida 33149-9915

Questions or requests for clarifications can be directed to Logbook Program at the Southeast Fisheries Science Center, telephone number (305) 361-4581 or (305) 361-4463.

During 1996, an active permit for the large pelagic fishery was issued to 1,245 vessels. These permits were not necessarily active during the entire calendar year, nor did all of these vessels actively fish for or catch large pelagic species. If logbooks and weighouts were not submitted for the catch of the 12 months in the reporting period prior to the expiration of the permit, the application for renewal was denied until all reporting was brought up to date.

#### *Dealer Reporting.*

Permitted dealers are required to provide reports twice a month to the Science and Research Director for either the Northeast Region or the Southeast Region, depending on the dealer's geographical location. Complete and timely information from dealers is critical because these data are used to monitor the fishery quota for swordfish. Dealers are instructed to provide the U.S. Coast Guard documentation or state registration number for every vessel from which they purchased swordfish during each two week reporting period. This information is used to check the dealer data against the daily catch data submitted by fishermen. This cross reference helps the SEFSC determine that all landings are included in the quota monitoring process and it also guards against potential double counting.

Reports should be mailed to:

Science and Research Director  
Southeast Fisheries Science Center  
National Marine Fisheries Service  
75 Virginia Beach Drive  
Miami, Florida 33149

Attention: A. Bertolino

except for a dealer whose principal place of business is in an Atlantic coastal state from Maine through Virginia. The appropriate address for those dealers is:

Northeast Regional Office  
National Marine Fisheries Service  
1 Blackburn Dr, Gloucester, MA  
01930

Attention: Greg Power

For most dealers in the Northeast Region, NMFS port agents contact and collect the dealer reports.

At sometime during calendar year 1996, a Federal dealer permit was held by 289 dealers. Of this total, 93 dealers had their primary location in the Northeast Region and the remaining 196 dealers had their primary location in the Southeast Region, which includes the Caribbean. Overall, compliance with the reporting requirements has been good in this area. However, dealers that do not cooperate with the NMFS and do not submit the required bi-monthly reports will have their application for a permit renewal denied, and NMFS Law Enforcement will be notified. It should be noted that a report is required for every two week period, even if large pelagic species were not purchased. If no purchases were made, the respective Center Director must be informed. In the Southeast Region, a form so-stating must be submitted.

#### ***SWORDFISH LANDINGS***

The Southeast Fisheries Science Center (SEFSC), Miami Laboratory, is responsible for

compiling the landings of U.S. caught Atlantic swordfish from mandatory reporting data. The monthly reported landings for 1990 -1996 may be found in Table 10. U.S. Atlantic swordfish landings decreased each year from 1990 to 1994, increased somewhat in 1995, then decreased again in 1996.

Monthly cumulative annual landings of U.S. Atlantic swordfish are compared in Figure 6 for years 1990-1996. Yearly U.S. Atlantic swordfish landings from 1991 to 1996 were lower than 1990 landings. These lower levels are, in part, the result of the minimum size regulation and due to fishery closures when allowable landing levels for the directed fishery were achieved.

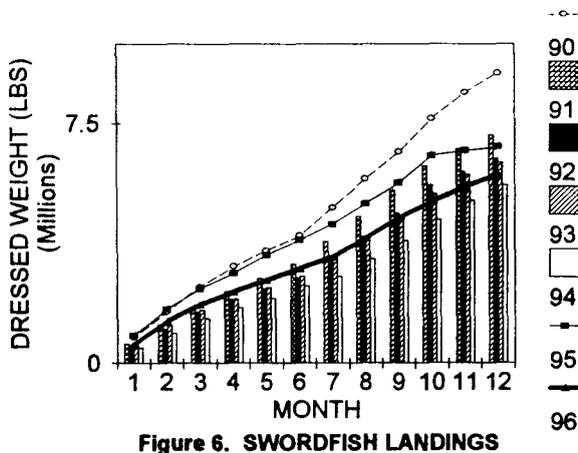


Figure 6. SWORDFISH LANDINGS

**SWORDFISH LANDED IN THE U.S.**

<u>Year</u>	<u>1,000 lbs. Dressed wt.</u>	<u>1,000 lbs. Whole wt.</u>
1989	10,582	14,075
1990	9,107	12,112
1991	7,142	9,499
1992	6,383	8,489
1993	6,274	8,345
1994	5,578	7,419
1995	6,764	8,996
1996	5,889	7,832

**SWORDFISH < 41 LBS. DRESSED WEIGHT - NUMBER AND PERCENT LANDED BY MONTH BY AREA**

The cumulative percent of fish landed less than 41 lbs dressed weight from all areas and all months fell from 41% in 1990 to 13% in 1993 and to 16% in 1996 (Table 11). The within area percentage landed catch of fish less than 41 lbs decreased in most areas between 1991 and 1995, but increased slightly in 1996 (Table 11). The highest numbers of undersize fish landed in 1996 were from the GOM and CAR regions ( Tables 10, 11 & 12).

**SWORDFISH < 41 LBS. DRESSED WEIGHT - PERCENT LANDED**

The proportion of U.S. Atlantic swordfish landed which were smaller than 41 lbs dressed weight has decreased since 1990 (Figure 7). In 1990 the highest number of fish landed were in the 21-41 lb category. In 1991 this peak shifted to the 41-60 lb category where it has since remained.

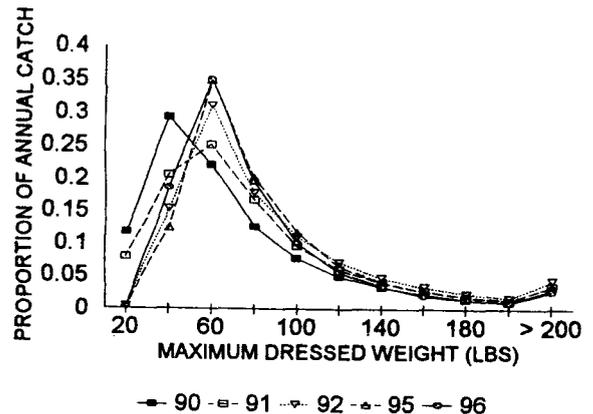


Figure 7. U.S. CATCH AT SIZE

**SWORDFISH SIZE FREQUENCY**

The proportion of swordfish landed which were less than 41 lbs dressed weight in size frequency samples from U.S. longline vessels, decreased from 1989 through 1995, then went up slightly in 1996 (Figure 8). This decrease resulted from the minimum size measure put in place in mid 1991.

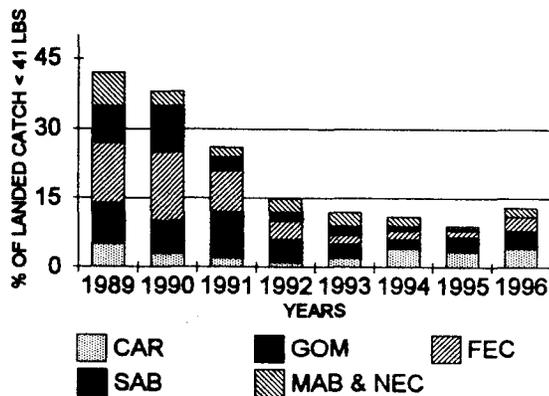


Figure 8. SWORDFISH SIZE FREQUENCY

### BYCATCH ESTIMATION

The 1996 observer and 1996 logbook records were used to estimate the numbers of dead discarded by the U.S. commercial fleet in 1996. Dead discards were estimated for swordfish, blue marlin, white marlin, and sailfish.

### DATA COLLECTION AND ANALYSES

In a comprehensive study on swordfish reproduction, gonadal tissue from 2,884 female swordfish were collected for use in analysis of ovarian development, maturity stages, and fecundity estimates for female swordfish. Fecundity estimates were based on microscopic examination of whole oocytes. Female swordfish produce eggs in batches and spawn about once every three days during the spawning season. One swordfish was estimated to produce over 9 million eggs (Arocha F., 1997).

Sex ratio information has been collected from over 18,500 Atlantic swordfish specimens sampled from 1990 through 1996. The available sex-ratio at size information was used to estimate the catch at age separately for female and male swordfish in the U.S. catch (Turner et al, 1996). This methodology was applied to catch at size data from 1985 through 1995 in support of assessment analyses designed to accommodate sexually dimorphic growth patterns. NMFS scientists continue to work with other ICCAT scientists to

develop a uniform method for calculation sex specific inputs to improve stock status evaluations, especially evaluations of the female spawning biomass component of the stock.

The number of tagged swordfish, released by U.S. longline vessels has substantially increased since the U.S. implemented minimum size regulations in 1991, in conformity with ICCAT recommendations. Most of these fish were smaller than the minimum size at time of release. Since 1991, annual releases have averaged about 1,200 fish, whereas average annual releases of tagged swordfish for 1988-1990 averaged about 350 fish. Reported recoveries of tagged swordfish have likewise increased since implementation of the minimum size. Since 1991, the annual number of swordfish tag recoveries reported has averaged more than 22 fish (in 1994 a total of 54 tagged swordfish were reported recaptured), while the annual average number reported from the period 1988-1990 was about 10.

During 1997 several sampling projects related to bluefin tuna stock structure and reproductive biology were initiated by NMFS and several academic institutions, and international cooperation was requested. Research on stock structure moved into the second phase in which samples from each of the two spawning areas would be compared to determine if differences in genetic frequencies exist. Research on micro constituents in bluefin otoliths is proposed for 1998 and 1999 and samples from young animals are needed from eastern and western fisheries. Research on developing an assay to determine sexual maturity from muscle is also proposed for 1998 and 1999 and samples are also needed from mature animals from eastern and western fisheries. During 1997, U.S. scientists collected samples for all of these projects (including more than 150 samples from small bluefin) and received statements of interest in cooperation for some of the projects from Canadian, Japanese, French, Moroccan and Spanish scientists

Studies related to genetic evaluations of the number of fishery management units of Atlantic bluefin are being coordinated by the NMFS laboratory in Charleston, S. C., in collaboration with researchers at FISHTEC. Research on regions in the mtDNA or genomic DNA indicates that these contain a sufficient amount of genetic variation to be informative in stock structure analyses. During 1996 sampling of landings of bluefin tuna for this research covered a broad range of age/size categories, while in 1997 sampling concentrated on 0-3 year old bluefin. The 1997 sampling was not as successful as hoped because of reduced bag limits in some areas and months and because of legal concerns about trying to catch and sample bluefin smaller than ICCAT's recommended minimum size (6.4 kg) and especially the 1.8 kg limit which has no tolerance.

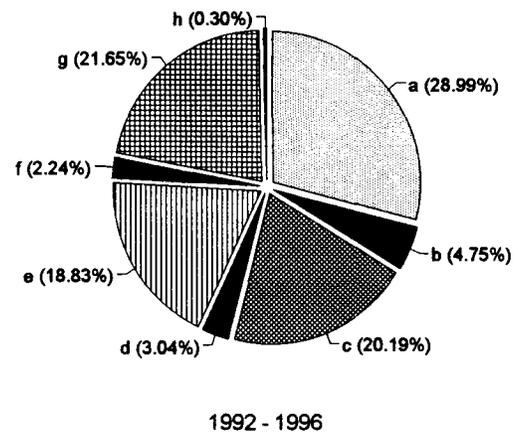
### **PELAGIC OBSERVER PROGRAM**

The National Marine Fisheries Service (NMFS) continues its scientific observer sampling of the U.S. large pelagic fleet, as mandated by the U.S. Swordfish Fisheries Management Plan. Scientific observers are placed aboard vessels participating in the Atlantic large pelagic fisheries by the Southeast Fisheries Science Center (SEFSC) and the Northeast Fisheries Science Center (NEFSC) since 1992. Over this time period, coverage by the SEFSC Pelagic Observer Program (POP) took place, but is not limited, to vessels fishing in the Atlantic south of Virginia. The scientific observer program contracted and monitored by the NEFSC was responsible for large pelagic fleet fishing the waters of the Mid-Atlantic Bight<sup>1</sup> to the Grand Banks. Beginning in 1996, the SEFSC assumed the responsibility of covering all of the geographical areas of the northwest Atlantic.

A scientific observer is placed on board the vessel to record detailed information on gear characteristics, the location and time of the gear set and retrieval, environmental conditions, the condition and status of the animals caught by the gear (alive or dead, kept or discarded), as well as morphometric measurements (length and weight)

and sex identification when possible (Figure 9). Observers also record the occasional interaction of marine mammals and sea turtles. The collection of biological samples (anal finrays, heads, reproductive, heart tissue, etc.) from some animals are used to support research studies to learn more about fish biology and life history behavior.

Catch data collected between May of 1992 and December of 1994 by the POP has been summarized in two published newsletters (NOAA Technical Memorandum, NMFS-SEFSC-347 and 377) which are available upon request. The POP continued its coverage through 1996 and data through mid 1997 are now computerized for analysis. Of the fish recorded by observers from 1992-1996 and summarized in various species groups, (Figure 9), swordfish was the highest percent occurrence (29%) species.



*Figure 9. Catch reported by scientific observers on U.S. longline vessels: swordfish (a), billfish (b), yellowfin, bigeye and bluefin tuna (c), other tunas (d), sharks and rays (e), unknown species (f), finfish (g), marine turtles, marine mammals, and birds (h).*

### **INSTRUCTIONS FOR USING THE PELAGIC LOGBOOKS FOR 1998**

Samples of forms and directions for filling out forms are presented in figures 10 - 15. There are 4 forms used for pelagic logbook reports in

1998: (1) a "trip summary" form, (2) a voluntary cost and earnings form, (3) a "set" form, and (4) a "no fishing" form. The trip summary form must be completed for every fishing trip when swordfish are caught and retained on board. A set form must be completed for every set made. A trip summary, set forms and a "tally" or weigh-out sheet must be submitted for every completed trip.

The voluntary cost and earnings form is used to provide information on the costs associated with the fishing trip. This information is voluntary.

The "no-fishing" form may be used to report no fishing in the swordfish/large pelagic, South Atlantic snapper-grouper, Gulf of Mexico reef fish, and shark fisheries. If the vessel did not fish in more than one of these fisheries, **ONLY SUBMIT ONE "NO-FISHING" FORM**. Check the space by each of the fisheries in which the vessel did not fish. Do NOT check fisheries for which your vessel does not have an active permit.

All forms are to be mailed in the pre-addressed, postage-paid envelopes that are included. If you mail the forms in another envelope, please use the following address:

NATIONAL MARINE FISHERIES SERVICE  
ATTN: LOGBOOK PROGRAM  
P.O. BOX 491500  
KEY BISCAYNE, FLORIDA 33149-9916

If there are question regarding completion of this form, please contact the Logbook Program at (305) 361-4485.

Monthly reporting for individuals holding a Swordfish permit will be considered complete and in compliance with the regulations only if 1) the trip summaries for each trip completed during the month, individual set records for each set made during the trip(s), and tally records for all fish sold are provided or, 2) a no fishing report is provided.

Again, as noted on the new logbook forms, **use of the current year forms will be necessary**

**for compliance. Further, all old forms should be destroyed upon receipt of the 1998 forms.**

#### **WHOM TO CONTACT FOR WHAT**

Any questions concerning Atlantic large pelagic resources swordfish projects at the Southeast Fisheries Science Center, NMFS, can be directed to Dr. Gerald Scott at (305) 361-4596. Questions concerning processing and analyzing the logbook data can be directed to Dr. Jean Cramer at (305) 361-4493. Information concerning permits can be directed to Ed Burgess at (813) 893-3722. Those needing 1993 logbooks can contact Ernie Snell at (305) 361-4462. Questions about the observer program should be directed to Dennis Lee (305) 361-4247 or Cheryl Brown (305) 361-4275. If you have comments on this newsletter, or other comments, you can write them on your logbook reports or send them to Dr. Jean Cramer, SEFSC, NMFS, 75 Virginia Beach Drive, Miami, FL 33149.

#### **REFERENCES**

- Arocha, F. 1997. The reproductive dynamics of swordfish, *Xiphias gladius L.*, and management implications in the North Western Atlantic. Ph.D. dissertation, University of Miami, Miami, FL, 383p.
- Turner, SC, V. R. Restrepo, and f. Arocha. 1996. Swordfish catch at size and catch by sex. SCRS/96/150.

**Figure 10. 1998 Pelagic Logbook - Trip Summary Form (The Blue Book)**

OMB NO. 0648-0016 EXP.9/30/2000

**1998 PELAGIC LOGBOOK TRIP SUMMARY**

Vessel Name: _____	Capt. Signature: _____
Vessel No.: _____	Contact Telephone: (    ) - _____
Port & State of Departure: _____	Port & State of Landing: _____
Date of Departure:        /        /1998	Date of Landing:        /        / 1998
	First Day of Offloading:        /        / 1998
	Last Day of Offloading:        /        / 1998
Number of Sets Placed: _____	Date of First Set:        /        / 1998
Number of Days Fished: _____	Date of Last Set:        /        / 1998
Dealer Name(s): _____	Federal Dealer Permit No. _____
_____	_____
_____	_____

Do not write in this section of the form. Please complete the cost information on the second page of the 3-page set. Although the cost information is voluntary, it will assist the National Marine Fisheries Service to determine the effect of future regulations on the swordfish and other large pelagic fisheries.

## Figure 11. INSTRUCTIONS FOR PELAGIC LOGBOOK TRIP SUMMARY FORMS

### Instructions for the Trip Summary Form

*Please use a ball point pen and print clearly.*

On the blue form (top page), record the following:

- Vessel Name
- Vessel No.: U.S. Coast Guard vessel identification number or state registration number as recorded on permit application
- Capt. Signature: signature of the captain for the trip
- Contact Telephone: telephone number of person responsible for the records
- Port & State of Departure: location of port from which the trip commenced
- Date of Departure: calendar day on which the trip was started
- Port & State of Landing: location of port that vessel arrived in
- Date of Landing: calendar day that vessel returned to port
- First day of Offloading: calendar day(s) that vessel began offloading fish
- Last day of Offloading: calendar day(s) that vessel finished offloading fish
- No. of Sets Placed: number of times the fishing gear was set during the trip
- No. of Days Fished: number of days that fishing gear was used
- Date of First Set: calendar day that fishing gear was first set
- Date of Last Set: calendar day that fishing gear was last used
- Dealer Name(s): list of names of dealers purchasing the harvest
- Federal Dealer Permit Number(s)

*Remove page, attach corresponding set forms and tally sheet, and mail within 7 days.*

The trip summary information recorded on the blue form will be transferred to the following green form where the expenditures and payments information is requested.

**NOTE: All data provided are *CONFIDENTIAL* and will be used to determine the impact of existing and proposed management policies on fishery participants. Consistent and accurate reporting is critical to the success of future policies in achieving the stated objective of increasing net benefits.**

On the green form (second page), record the following:

- Expenditures on Supplies: quantity and total cost of bait, fuel, and ice used during the trip and the total costs of docking and unloading fees, tackle/gear (e.g., light sticks, line, gangions, hooks, buoys), groceries, and other miscellaneous expenses.  
*Note: If any of these supplies were not purchased for this trip (e.g. light sticks are left over from previous trips, bait is harvested prior to fishing in the directed fisheries, or the vessel has an ice machine on board) please estimate and enter the value of the quantities used during the trip. If this is not possible, please make a note of this on the green form.*
- End of Trip Payments: total payments made to the owner (if not owner-operated), captain, and crew, also note the total number of crew members (excluding the captain) that will share the crew payment.

*This page should be sent when all the information is available, but no later than 45 days after the sale of the fish.*

**Figure 12. 1998 Pelagic Logbook - Voluntary Cost and Earnings Questions**

Trip Expense Summary (confidential)		
	<u>Quantity</u>	<u>Total Cost</u>
Fuel	_____ gallons	\$ _____
Bait <i>(If purchased by boxes, please convert to pounds)</i>	_____ pounds	\$ _____
Ice <i>(If purchased by blocks, please convert to pounds)</i>	_____ pounds	\$ _____
Docking/Unloading Fee		\$ _____
_____		
Tackle/Gear Expenses <i>(Total for trip including light sticks, line gangions, hooks, etc.)</i>		\$ _____
_____		
Grocery Expenses		\$ _____
_____		
Other Expenses		\$ _____
_____		
<b>TOTAL TRIP COSTS</b> <i>(All costs incurred for this trip excluding End of Trip Payment Summary listed below)</i>		\$ _____

End of Trip Payments Summary (confidential)	
	<u>Total Payment</u>
OWNER:	\$ _____
CAPTAIN:	\$ _____
CREW:	\$ _____ <i>(Total)</i>
Number of Crew _____	<i>(Number of people that share the crew payment listed above)</i>

Figure 13. PELAGIC LOGBOOK SET FORM (The White Book)

NOAA Form 88-191 (08/96)

MAIL THIS COPY TO: NATIONAL MARINE FISHERIES SERVICE

OMB Number 0648-0016  
Expiration Date 9/30/2000

1998 PELAGIC LOGBOOK – Set Form									
Official Vessel Number: _____									
TARGET: <input type="checkbox"/> Swordfish <input type="checkbox"/> Yellowfin <input type="checkbox"/> Bigeye <input type="checkbox"/> Mixed Tuna <input type="checkbox"/> Sharks <input type="checkbox"/> Other (list) _____									
GEAR: <input type="checkbox"/> Pelagic Longline <input type="checkbox"/> Bottom Longline <input type="checkbox"/> Handline <input type="checkbox"/> Harpoon <input type="checkbox"/> Gillnet <input type="checkbox"/> Bandit <input type="checkbox"/> Rod & Reel <input type="checkbox"/> Pair Trawl <input type="checkbox"/> Otter Trawl <input type="checkbox"/> Otter Trawl (Squid) <input type="checkbox"/> Other (list) _____									
SET DATE: _____ / _____ / 1998					HAULBACK DATE: _____ / _____ / 1998				
Begin Set:		End Set:			Begin Haulback:		End Haulback:		
_____ am pm		_____ am pm			_____ am pm		_____ am pm		
Latitude at beginning:		Longitude at beginning:			Surface Water Temp:				
_____ N		_____ W			_____ F				
LONGLINE:					GILLNET:		PAIR TRAWL:		
No. of Hooks: _____		Use Line Thrower? <input type="checkbox"/> Y <input type="checkbox"/> N			Mesh size (in): _____		Fishing Circle Mesh Size (cm): _____		
No. Hooks between Floats: _____		Were You Tending/Rebaiting			Total Net Length (fm): _____		No. Meshes at Fish Circle: _____		
No. of Light Sticks: _____		books before haulback?			Fishing Depth Range (fm):		Smallest Mesh Size (cm): _____		
Mainline Length (nm): _____		_____ Y _____ N If Yes,			_____ to _____		Cod End Mesh Size (cm): _____		
Gangion Length (fm): _____		Number of hooks rebated: _____					Official Number of Pair Vessel: _____		
Floatline Length (fm): _____		Bait Used: <input type="checkbox"/> Live <input type="checkbox"/> Dead <input type="checkbox"/> Artificial							
SWORDFISH and TUNA:					SHARK (Total Number):				
	No. Kept	No. Thrown Back:		Est. Lbs. Kept		No. Kept	No. Thrown Back:		Est. Lbs. Kept
		Alive	Dead				Alive	Dead	
SWORDFISH					PELAGIC SHARK:				
					Blue				
					Mako, Longfin				
					Mako, Shortfin				
					Oceanic Whitetip				
					Porbeagle				
					Thresher, Bigeye				
					Thresher, Common				
OTHER TUNA					OTHER				
OTHER SPECIES (Total Number):					COASTAL SHARK:				
					Bignose				
					Blacktip				
					Dusky				
					Hammerhead, Great				
					Hammerhead, Scalloped				
					Hammerhead, Smooth				
					Night				
					Sandbar				
					Silky				
					Spinner				
OTHER					Tiger				
					White				
					OTHER				
SEA TURTLES (Total Number):									
	Involved	Injured	Dead		Involved	Injured	Dead		
					Kemp's Ridley				
					Hawksbill				
					Unknown				

COMMENTS:

**Figure 14. INSTRUCTIONS FOR PELAGIC LOGBOOK SET FORM**

**Revised (9-97)**

**IMPORTANT INSTRUCTIONS**

Please print all information clearly.

**DESTROY OLD FORMS. USE ONLY CURRENT YEAR FORMS.**

-----Please use a separate log sheet for each set.

Record the, Official Vessel Number.

Designate primary Target species.

Record Gear Used.

Record Set Date (calendar day when set began) and Haulback Date.

Enter Times when using longlines or gillnets for:

- Begin Set and Begin Haulback (designate AM or PM)
- End Set and End Haulback (designate AM or PM)

At the start of each set, record the location to the nearest degree of LAT (Latitude) and LON (Longitude), and the Surface Water Temperature, in degrees Fahrenheit.

Enter the following data for each set if using Longline gear:

- Number of hooks set
- Number of hooks between floats
- Number of light sticks
- Length of Mainline (in miles)
- Length of Gangions (in fathoms)
- Length of Floatline (in fathoms)
- Did you use a line thrower?
- Were you tending or rebaiting hooks before haulback? If yes, specify how many hooks were rebaited.
- Bait: indicate Live, Dead or Artificial.

Enter the following data for each set if using Gillnet:

- Mesh Size (in inches)
- Total drift gillnet net length (in fathoms)
- Fishing Depth Range (Depth of top and of Bottom of net in fathoms)

Enter the following data for each set if using Pair Trawl

Pair trawl vessels should fill out a daily form for each set made. Species information should be filled out only by the vessel that hauls back the net.

- Fishing Circle Mesh Size (in centimeters)
- Number of Meshes Around Fishing Circle (do not include gorges)
- Smallest Mesh Size (in centimeters)
- Cod End Mesh Size (in centimeters)
- Official number of other vessel in pair

Record Estimated total dressed weight (in pounds) of fish kept.

Record NUMBERS OF SWORDFISH, TUNAS, SHARKS AND OTHER SPECIES KEPT AND THROWN BACK. Specify the number of fish that were thrown back Alive and the number thrown back Dead.

Record NUMBERS OF SEA TURTLES INVOLVED

- Total Number Involved. Write down the total number of each sea turtle species that were caught in, or interacted with, your fishing gear for the period of your report.
- Number Injured. Write down the number of each sea turtle species that were injured while in, or by, your fishing gear.
- Number Dead. Write down the number of each sea turtle species that were observed to be dead while in, or by, your fishing gear.

Mail original logs to NMFS at the end of the fishing trip in pre-addressed envelopes along with the Trip Summary Form and weighout slip.

Mailing should be postmarked not later than the 7th day after the sale of the catch.

Monthly reporting for individuals holding a Swordfish permit will be considered complete and in compliance with the regulations only if 1) the trip summaries for each trip completed during the month, individual set records for each set made during the trip(s), and tally records for all fish sold are provided or 2) a no fishing report is provided.

Figure 15. NO FISHING FORM.

OMB # 0648-0016 Exp. 9/30/2000

<b>NMFS Use Only:</b> <b>Opened:</b>	<b>Schedule #</b>
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**NO FISHING REPORTING FORM**

VESSEL ID. NO. \_\_\_\_\_ VESSEL NAME: \_\_\_\_\_

During the entire month of \_\_\_\_\_, year \_\_\_\_\_, this vessel DID NOT FISH in the fisheries checked below:

▶  
more than one fishery may be checked

▶  
DO NOT check any fishery if your vessel does not have a permit for it.

- \_\_\_\_\_ Pelagic (Swordfish)
- \_\_\_\_\_ South Atlantic Snapper-Grouper
- \_\_\_\_\_ Gulf of Mexico Reef Fish
- \_\_\_\_\_ Shark
- \_\_\_\_\_ King Mackerel
- \_\_\_\_\_ Spanish Mackerel

Signature \_\_\_\_\_ Phone ( ) \_\_\_\_\_ - \_\_\_\_\_

**RETAIN THIS COPY FOR YOUR RECORDS**

OMB # 0648-0016 Exp. 9/30/2000

<b>NMFS Use Only:</b> <b>Opened:</b>	<b>Schedule #</b>
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**NO FISHING REPORTING FORM**

VESSEL ID. NO. \_\_\_\_\_ VESSEL NAME: \_\_\_\_\_

During the entire month of \_\_\_\_\_, year \_\_\_\_\_, this vessel DID NOT FISH in the fisheries checked below:

▶  
more than one fishery may be checked

▶  
DO NOT check any fishery if your vessel does not have a permit for it.

- \_\_\_\_\_ Pelagic (Swordfish)
- \_\_\_\_\_ South Atlantic Snapper-Grouper
- \_\_\_\_\_ Gulf of Mexico Reef Fish
- \_\_\_\_\_ Shark
- \_\_\_\_\_ King Mackerel
- \_\_\_\_\_ Spanish Mackerel

Signature \_\_\_\_\_ Phone ( ) \_\_\_\_\_ - \_\_\_\_\_

**Table 1.** TOTAL NUMBER OF SWORDFISH, TUNA, AND BILLFISH REPORTED CAUGHT BY LONGLINE BOATS, BY AREA, AND EFFORT IN NUMBER OF HOOKS, FROM THE SWORDFISH MANDATORY LOGBOOKS, FOR (a) 1994, (b) 1995 and (c) 1996 (PRELIMINARY). NUMBERS CAUGHT REPRESENT KEPT PLUS DISCARDED (DEAD OR ALIVE). SEE FIGURE 1 FOR DESIGNATION OF AREAS. (SWD=SWORDFISH; YFT=YELLOWFIN; BET=BIGEYE; BFT=BLUEFIN; ALB=ALBACORE; WHM=WHITE MARLIN; BUM=BLUE MARLIN; SAI=SAILFISH.)

1a. 1994										
Area	SWD	YFT	BET	BFT	ALB	WHM	BUM	SAI	HOOKS	BOATS
CAR	16479	1554	894	10	189	202	881	56	629690	42
GOM	12642	31963	316	135	128	545	622	995	2459872	115
FEC	17696	805	1849	43	423	205	333	478	696754	85
SAB	15072	4418	139	133	115	199	429	308	826025	83
MAB	8847	22480	10817	219	4896	831	106	30	2189715	105
NEC	4043	5595	5154	904	2739	235	63	4	768585	59
NED	20967	462	2190	52	930	14	15	0	810118	35
SAR	2289	280	801	78	1070	109	45	3	206554	37
NCA	5367	1309	521	2	653	51	119	23	286300	34
TUN	201	1213	147	1	26	159	316	62	70523	7
TUS	0	0	0	0	0	0	0	0	0	0
<b>TOTAL</b>	<b>103603</b>	<b>70079</b>	<b>22828</b>	<b>1577</b>	<b>11169</b>	<b>2550</b>	<b>2929</b>	<b>1959</b>	<b>8944136</b>	<b>282</b>

1b. 1995										
Area	SWD	YFT	BET	BFT	ALB	WHM	BUM	SAI	HOOKS	BOATS
CAR	13572	1857	1309	0	181	272	699	89	598704	42
GOM	16626	25717	880	116	128	645	553	666	2648273	140
FEC	13560	1017	1355	44	494	120	134	159	643091	67
SAB	10234	7373	125	41	116	191	262	164	853595	77
MAB	7149	35770	8437	1764	5181	834	166	18	2385664	108
NEC	4026	7137	6378	1163	4187	363	63	1	1054433	56
NED	21615	526	3731	22	323	22	16	0	766685	24
SAR	206	40	88	18	142	3	4	1	25480	12
NCA	14987	1599	954	13	3534	338	385	42	854809	38
TUN	1154	3215	351	0	173	378	594	97	224784	15
TUS	8	75	7	0	0	0	21	1	3000	1
<b>TOTAL</b>	<b>103137</b>	<b>84326</b>	<b>23615</b>	<b>3181</b>	<b>14459</b>	<b>3166</b>	<b>2897</b>	<b>1238</b>	<b>10058518</b>	<b>299</b>

1c. 1996										
Area	SWD	YFT	BET	BFT	ALB	WHM	BUM	SAI	HOOKS	BOATS
CAR	12696	780	841	0	294	171	460	44	639048	57
GOM	18710	31568	396	106	116	913	832	563	3566789	132
FEC	13394	762	1410	28	248	107	203	300	587319	74
SAB	15887	6102	1041	81	586	284	385	247	1647730	87
MAB	1924	10199	2244	197	467	271	48	14	1018097	86
NEC	1661	5860	4965	1449	924	407	250	10	1090304	62
NED	14494	363	3527	15	896	12	3	0	596782	22
SAR	722	79	379	16	382	33	6	2	76185	12
NCA	6552	888	571	1	858	160	134	13	480665	31
TUN	4508	4558	1714	0	219	420	820	188	358431	16
TUS	4088	742	804	0	83	35	112	31	163711	8
TOTAL	94636	61901	17892	1893	5073	2813	3253	1412	10225061	264

**Table 2.** TOTAL NUMBER OF SWORDFISH, TUNA, AND BILLFISH REPORTED CAUGHT BY GILLNET BOATS, BY AREA, AND EFFORT IN NUMBER OF SETS AND NUMBER OF BOATS, FROM THE SWORDFISH MANDATORY LOGBOOKS, FOR (a) 1994, (b) 1995 and (c) 1996 (PRELIMINARY). NUMBERS CAUGHT REPRESENT KEPT PLUS DISCARDED (DEAD OR ALIVE). SEE FIGURE 1 FOR DESIGNATION OF AREAS. (SWD=SWORDFISH; YFT=YELLOWFIN; BET=BIGEYE; BFT=BLUEFIN; ALB=ALBACORE; WHM=WHITE MARLIN; BUM=BLUE MARLIN; SAI=SAILFISH.)

2a. 1994										
Area	SWD	YFT	BET	BFT	ALB	WHM	BUM	SAI	SETS	BOATS
MAB	0	0	1	0	0	0	0	0	1	1
NEC	203	216	0	1	6	0	0	0	57	5
NED	839	76	43	14	143	0	1	0	131	11
TOTAL	1042	292	44	15	149	0	1	0	189	12

2b. 1995										
Area	SWD	YFT	BET	BFT	ALB	WHM	BUM	SAI	SETS	BOATS
NEC	1007	141	61	108	129	4	0	0	149	12
TOTAL	1007	141	61	108	129	4	0	0	149	12

2c. 1996										
Area	SWD	YFT	BET	BFT	ALB	WHM	BUM	SAI	SETS	BOATS
MAB	3	0	1	0	0	0	0	0	11	2
NEC	877	64	10	35	20	0	0	0	135	9
TOTAL	880	64	11	35	20	0	0	0	146	11

**Table 3. YEARLY TABULATIONS FOR SWORDFISH AND YELLOWFIN TUNA FOR (a) 1994, (b) 1995 AND (c) 1996 (PRELIMINARY). THE AREAS ARE DEFINED IN FIGURE 1. INFORMATION INCLUDES NUMBER OF FISH KEPT PLUS DISCARDED (K&D); PERCENTAGE KEPT (%K), PERCENTAGE DISCARDED DEAD (%D DEAD, PERCENTAGE DISCARDED ALIVE (%D LIVE); EFFORT IN HOOKS (HOOKS); NUMBER OF SETS (N); AND AVERAGE OF THE INDIVIDUAL CATCH RATES [AVG(C/E)] , EQUIVALENT TO CPUE IN # OF FISH/100 HOOKS.**

3a. 1994			SWORDFISH					YELLOWFIN				
AREA	HOOKS	N	K&D	%K	%D DEAD	%D LIVE	AVG C/E	K&D	%K	%D DEAD	%D LIVE	AVG C/E
CAR	632318	1423	16534	80	11	8	2.703	1558	94	2	3	0.246
GOM	2999968	4041	13922	39	38	22	0.959	33719	96	2	1	2.705
FEC	777558	2393	17675	40	41	17	2.861	815	94	0	5	0.095
SAB	1058246	2157	15507	46	38	14	2.021	4428	92	1	5	0.407
MAB	2425091	3531	8903	47	27	25	0.399	22807	91	3	4	1.047
NEC	792255	1086	4050	46	26	26	0.554	5758	91	1	7	1.057
NED	818797	1065	21174	82	10	7	2.629	1084	73	25	0	0.195
SAR	207054	367	2289	86	5	8	1.148	280	94	2	3	0.132
NCA	290984	440	5409	93	2	3	1.90	1198	96	2	1	0.382
TUN	71123	107	201	70	8	20	0.289	1220	94	4	0	1.698
TUS	0	0	0									
TOTAL	10073394	16610	105664	60	25	14	1.507	72867	94	2	3	1.074

3b. 1995			SWORDFISH					YELLOWFIN				
AREA	HOOKS	N	K&D	%K	%D DEAD	%D LIVE	AVG C/E	K&D	%K	%D DEAD	%D LIVE	AVG C/E
CAR	603874	1362	13498	81	10	8	2.297	1865	89	1	8	0.292
GOM	3205894	4311	17444	60	25	14	1.134	27078	97	1	0	2.649
FEC	677955	2119	13519	53	30	15	2.375	1016	93	2	3	0.127
SAB	1046666	1945	10211	63	23	13	1.278	7367	97	1	1	1.275
MAB	2552893	3618	7115	50	28	20	0.293	35633	96	1	1	1.457
NEC	1061338	1291	4020	53	24	22	0.396	7129	95	2	1	0.709
NED	775395	986	21548	78	12	8	2.830	769	96	0	3	0.097
SAR	25480	41	206	80	7	11	0.904	40	97	0	2	0.162
NCA	862328	1216	14938	92	4	3	1.983	1755	95	0	3	2.722
TUN	224784	319	1154	69	11	19	0.510	3215	97	1	0	1.465
TUS	3000	5	8	25	25	50	0.263	75	100	0	0	2.531
TOTAL	11039607	17213	103661	70	18	11	1.308	85942	96	1	1	1.432

3c. 1996			SWORDFISH					YELLOWFIN				
AREA	HOOKS	N	K&D	%K	%D DEAD	%D LIVE	AVG C/E	K&D	%K	%D DEAD	%D LIVE	AVG C/E
CAR	639048	1224	12696	79	10	9	2.028	780	85	0	13	0.122
GOM	3566789	5086	18710	68	18	13	0.864	31568	97	0	1	0.777
FEC	587319	1904	13394	55	31	12	2.642	762	96	1	1	0.121
SAB	1647730	2897	15887	68	18	12	1.221	6102	95	1	3	0.438
MAB	1018097	1616	1924	78	9	11	0.212	10199	96	1	2	2.682
NEC	1090304	1341	1661	81	8	10	0.164	5860	97	0	1	0.536
NED	596782	707	14494	87	7	5	2.470	363	96	0	2	0.068
SAR	76185	127	722	90	4	5	1.082	79	97	0	2	0.110
NCA	480665	669	6552	93	2	3	1.351	888	98	0	0	1.335
TUN	358431	491	4508	87	5	6	1.195	4558	96	0	2	1.317
TUS	163711	190	4088	95	2	2	2.545	742	90	0	8	0.450
TOTAL	10225061	16252	94636	75	14	9	1.222	61901	96	1	2	0.759

**Table 4. ATLANTIC SWORDFISH RESOURCE STATUS SUMMARY**

	North Atlantic	South Atlantic
Maximum Sustainable Yield <sup>1</sup>	13,000(5,300-16,500MT) <sup>2</sup>	14,200 MT (5,200-16,900MT)
Current (1996) Yield	14,763 MT	17,983 MT
Current (1996) Replacement Yield <sup>1</sup>	11,300 MT (7,120-16,710 MT)	14,620 MT (8,400-17,140 MT)
Relative Biomass( $B_{1996}/B_{msy}$ ) <sup>1</sup>	0.58 (0.41-1.04 MT)	0.99 (0.82-1.18)
Relative Fishing Mortality:		
$F_{1997}/F_{MSY}$ <sup>1</sup>	2.05 (1.07-3.82) <sup>1</sup>	1.24 (0.94-1.93)
$F_{1997}/F_{max}$ <sup>2</sup>	2.4	not estimated <sup>4</sup>
$F_{1997}/F_{0.1}$ <sup>2</sup>	3.5	not estimated <sup>4</sup>
Management Measures in Effect	25 kg minimum size; Country-specific quotas	Limit catch to 1993 or 1994 levels

<sup>1</sup> Base case production model results based on catch data 1950-1995

<sup>2</sup> Base case VPA results based on catch data through 1995

<sup>3</sup> 80% confidence intervals are shown

<sup>4</sup> Production model results do not provide basis for these estimates

**Table 5. ATLANTIC AND MEDITERRANEAN ALBACORE RESOURCE STATUS SUMMARY**

	North Atlantic	South Atlantic	Mediterranean
Maximum Sustainable Yield	poorly estimated	26,400	not estimated
Current (1996) Yield	28,761	24,098	unknown
Current (1997) Replacement Yield	poorly estimated	26,500	not estimated
Relative Biomass			
$B_{1996}/B_{MSY}$	poorly estimated	0.78	-
SPR	0.165	-	-
$R_{89-93}/R_{75-80}$	0.782	-	-
Relative Fishing Mortality:			
$F_{1996}/F_{MSY}$	poorly estimated	1.16	not estimated
$F_{1997}/F_{max}$	0.798	-	-
Management Measures in Effect	none	Limit catches to 90% of the average 1989-1993 levels	none

<sup>1</sup> Results of the ASPM were very sensitive for the north. Therefore, estimates are not included in the table.

<sup>2</sup> 95% Confidence interval range in parenthesis

<sup>3</sup> Spawning Potential Ratio.

<sup>4</sup> Recruitment level during 1989-1993 compared to 1975-1980

- = not estimated

**Table 6. BIGEYE TUNA RESOURCE STATUS SUMMARY**

Maximum Sustainable Yield (likely range)	70,000-90,000 MT*
Current (1996) Yield	107,300 MT
Current (1996) Replacement Yield**	60,000-80,000 MT
Relative Biomass( $B_{1997}/B_{msy}$ )	0.6 - 0.8
Relative Fishing Mortality: $F_{1996}/F_{MSY}$ **	1.5 - 2.2
$F_{1993-95}/F_{0.1}$ ***	1.1 - 1.5
$F_{1993-95}/F_{max}$ ***	0.8 - 1.2
Management Measures in Effect	3.2 kg minimum size

\*This range is representative of MSY ranges predicted by ASPIC and PRODFIT models.

\*\* Non-equilibrium production model (ASPIC)

\*\*\* Assumes a range of average fishing mortalities over the years 1993-95 of 0.38-0.53 for age 1 fish, based on VPA analyses

In this table, ranges of point estimates were given for replacement yields and relative ratios.

**Table 7. YELLOWFIN TUNA RESOURCE STATUS SUMMARY**

	Results of the 1994 Assessment	Results of the 1997 Assessment
Maximum Sustainable Yield		
Equilibrium model	153.7 <sup>1</sup>	154.0 <sup>2</sup>
Non-equilibrium model	149.0 (123.0-164.0) <sup>3</sup>	not estimated
Current (1995) Yield		136.9
Current (1994) Replacement Yield	(123.0-164.0) <sup>4</sup>	not available
Relative Biomass( $B_{1994}/B_{msy}$ )	1.05 (0.81-1.30)	not estimated
Relative Fishing Mortality ( $F_{1994}/F_{MSY}$ )	0.92 (0.67-1.34)	not estimated
Management Measures in Effect	3.2 kg minimum size Effective effort not to exceed 1992 level	3.2 kg minimum size Effective effort not to exceed 1992 level

1. Equilibrium model assuming shape parameter for production function (m=1) calculated at 1994 SCRS using data from 1969-93.

2. Equilibrium model assuming shape parameter (m=1) calculated at 1997 SCRS using data from 1969-96.

3. Non-equilibrium production model fit to data 1969-93 at the 1994 SCRS. Assumes production function shape parameter m=2.80% confidence bounds.

4. Replacement yield in 1994 estimated within the 80% confidence interval estimated MSY from the non-equilibrium production model since  $B_{1994}/B_{msy}$  was estimated at 1.05.

**Table 8. NUMBERS OF PERMITTED VESSELS**

<u>YEAR</u>	<u>FISHED</u>	<u>CAUGHT SWORDFISH</u>	<u>CAUGHT SWORDFISH IN 5 MONTHS</u>	<u>HOOKS REPORTED</u>
1987	296	273	180	6,556,416
1988	387	337	210	7,009,508
1989	455	415	250	7,941,675
1990	416	362	209	7,500,450
1991	342	308	175	7,744,997
1992	337	303	183	9,075,451
1993	432	305	175	9,724,645
1994	498	304	176	10,323,542
1995	488	314	197	11,253,430
1996	354	271	184	10,404,889

**Table 9. MONTHLY SWORDFISH LANDINGS IN LBS DRESSED WEIGHT FROM 1990 TO 1996.**

<u>YEAR</u>	<u>MONTH</u>						<u>TOTAL</u>
	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	
1990	839,178	794,926	760,177	631,254	493,183	449,220	
1991	613,177	619,188	554,422	465,789	416,747	432,630	
1992	514,101	575,942	520,299	374,432	358,252	317,612	
1993	561,698	648,585	470,918	341,690	365,752	337,134	
1994	484,972	472,599	458,475	327,608	299,262	383,626	
1995	889,512	811,460	630,410	488,293	554,793	467,913	
1996	596,262	738,304	509,953	388,765	363,694	351,284	
<u>YEAR</u>	<u>MONTH</u>						<u>TOTAL</u>
	<u>JUL</u>	<u>AUG</u>	<u>SEPT</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	
1990	895,303	888,258	851,158	1,053,476	806,843	644,159	9,107,135
1991	709,718	773,515	816,558	766,909	527,175	446,311	7,142,139
1992	561,906	731,830	727,037	891,336	423,457	387,010	6,383,214
1993	582,835	585,084	647,994	755,021	589,865	387,627	6,274,203
1994	290,811	539,202	560,993	672,465	592,585	495,542	5,578,140
1995	493,062	651,421	654,380	850,667	145,897	126,307	6,764,115
1996	370,895	568,722	635,336	525,918	455,680	384,352	5,889,165

**Table 10.** PERCENTAGE OF ANNUAL U.S. SWORDFISH LANDED CATCH < 41 LBS BY AREAS (TOTAL ANNUAL CATCH OF SWORDFISH IN AREA/ TOTAL ANNUAL CATCH OF SWORDFISH IN ALL AREAS).

YEAR	CAR <sup>1</sup>	GOM	FEC	SAB	MAB	NEC	NED	SUM
1989	13	18	24	5	8	9	23	100
1990	15	12	30	5	14	11	14	101
1991	16	21	23	4	9	7	21	101
1992	15	18	20	5	9	8	25	100
1993	18	14	15	9	7	7	30	100
1994	28	9	14	10	9	4	25	99
1995	26	25	10	9	3	4	22	99
1996	32	21	11	15	2	3	16	100

1. CAR includes SAR, NCA, TUN, and TUS

**Table 11.** PERCENTAGE OF ANNUAL US SWORDFISH LANDED CATCH < 41 LBS BY AREAS (ANNUAL OF CATCH OF SWORDFISH < 41 LBS IN AREA / TOTAL ANNUAL CATCH OF SWORDFISH IN ALL AREAS).

YEAR	CAR <sup>1</sup>	GOM	FEC	SAB	MAB	NEC	NED	SUM
1989	5	9	13	3	5	3	7	45
1990	3	7	15	3	7	3	3	41
1991	2	10	9	2	2	1	2	28
1992	1	5	4	1	1	1	3	16
1993	2	3	2	1	1	1	3	13
1994	4	2	2	2	1	0	2	13
1995	3	3	1	1	0	1	3	12
1996	4	4	3	3	0	0	2	16

1. CAR includes SAR, NCA, TUN, and TUS

**Table 12.** PERCENTAGE OF SWORDFISH LANDED CATCH < 41 LBS WITHIN AREAS (ANNUAL CATCH OF SWORDFISH < 41 LBS IN AREA / ANNUAL CATCH OF SWORDFISH IN AREA).

YEAR	CAR <sup>1</sup>	GOM	FEC	SAB	MAB	NEC	NED
1989	36	53	55	66	61	33	32
1990	23	60	52	60	50	24	22
1991	15	51	39	53	22	10	8
1992	9	26	21	24	10	11	10
1993	9	20	15	16	14	8	11
1994	13	21	15	15	13	11	9
1995	11	23	15	17	12	16	15
1996	12	20	23	21	18	10	9

1. CAR includes SAR, NCA, TUN, and TUS