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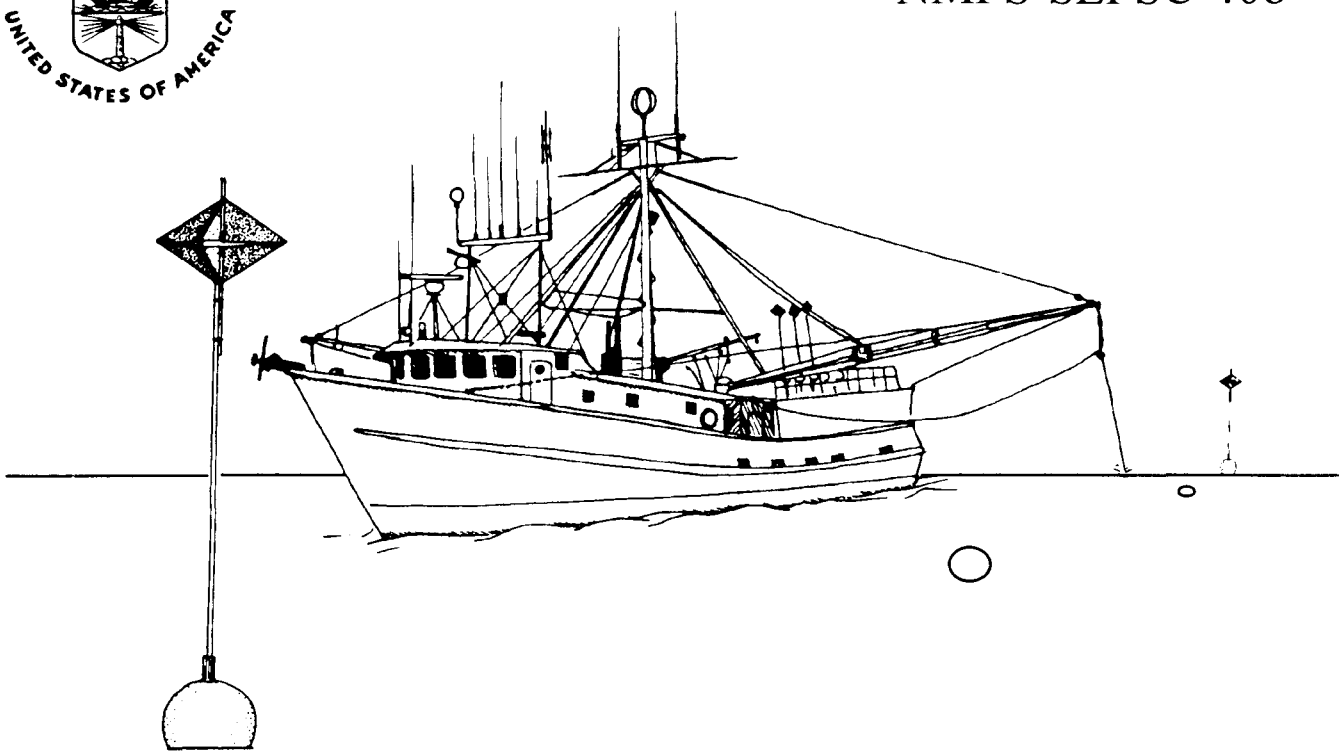
NMFS-SEFSC-408



SEFSC PELAGIC OBSERVER PROGRAM DATA SUMMARY FOR 1992-1996

Dennis W. Lee and Cheryl J. Brown

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
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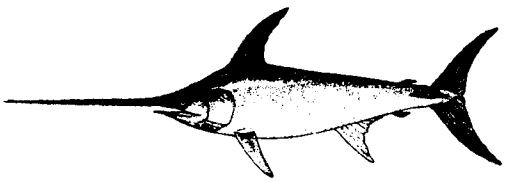

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NOTICE

THIS REPORT SHOULD BE CITED AS FOLLOWS:

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INTRODUCTION

In 1992, the National Marine Fisheries Service (NMFS) initiated scientific sampling of the U.S. large pelagic fisheries longline fleet, as mandated by the U.S. Swordfish Fisheries Management Plan. Scientific observers were placed aboard vessels participating in the Atlantic large pelagic fishery by the Southeast Fisheries Science Center (SEFSC) and the Northeast Fisheries Science Center (NEFSC). The SEFSC coverage occurs on, but is not limited to, vessels fishing for large pelagic species in the northwest Atlantic south of Virginia. The scientific observer program contracted and monitored by the NEFSC provides coverage of the large pelagic fleet fishing the offshore waters from Virginia north to the Grand Banks. Although both regional programs sample the pelagic longline fishery, the NEFSC data were not available for a thorough analysis through 1996. Only the numbers of longline vessels covered and sets observed were summarized for this report.

As described in previous documents (Lee et al. 1994, 1995), observer coverage by the Pelagic Observer Program (POP) since 1992 has been based on both NMFS employed observers, as well as independent contracted personnel. During 1995, the POP primarily used private contractors for field observation.

The POP has also been assisted by observers employed by Russell Research Associates, Inc. (RRA) which was funded through a Marine Fisheries Initiative grant (MARFIN). This MARFIN program was vital in helping the SEFSC describe the longline fishery of the Gulf of Mexico from 1993 to 1995. RRA observers, who also received training at the SEFSC Miami facility, made a major contribution in the collection of statistical and biological data from the Gulf of Mexico. These observers concentrated primarily on the Mississippi River Delta (Louisiana) ports because of their familiarity with vessel operations within that area.

The SEFSC program trains scientific observers to record detailed information concerning gear characteristics, location and time the gear is set and retrieved, environmental conditions, status and action of the marine life caught by the gear (alive or dead, kept or discarded), as well as morphometric measurements (length and weight) and sex identification of the animal. Observers also record incidental interactions of marine mammals and sea turtles. Collections of biological samples (anal fin rays, heads, reproductive tissue, heart tissue, etc.) from some species are used to support research studies directed at critical questions about fish biology and life history.

The data collected by both NMFS regional programs are used by scientists in a variety of ways. Observer catch and effort data help confirm and augment the information provided through the mandatory submission of Pelagic Logbook forms by vessel owners and operators. This information is also important in evaluating the effectiveness of management measures, as well as providing information for evaluating the stock status of harvested swordfish and other marine species.

The purpose of this document is to provide a general overview of the POP and summary of data collected in the southeast region through 1996.

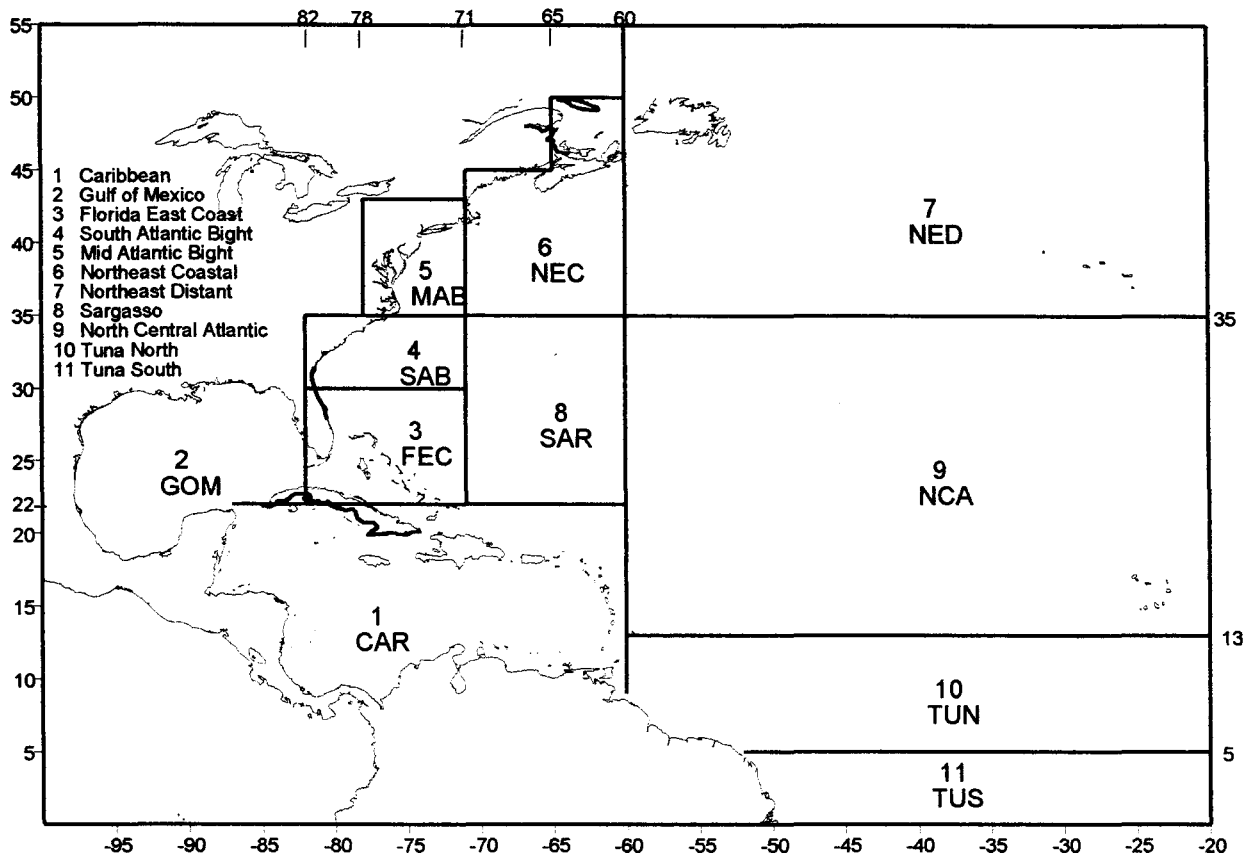

Figure 1. The fishing area definitions used in classifying the U.S. pelagic longline effort.

OBSERVER PERSONNEL

Observers from both the NEFSC and SEFSC regions receive training in sampling techniques, first aid and marine safety, as well as how to conduct themselves professionally in the field. They are also made aware that living conditions aboard ocean-going vessels can be variable (e.g. lack of personal bunk, shower or toilet facilities). While an observer is aboard your vessel, the operator and crew must allow the observer time to collect statistical and biological data, however, any delay in the normal routine of processing the fish should be minimal.

VESSEL SELECTION

In order to obtain a representative, scientific sample of the fleet fishing effort, a list of randomly selected pelagic longline vessels is generated for each geographical area (Figure 1) and quarter for the current year, based upon reports of their effort (number of sets) from the Pelagic Logbook forms and landing records from the previous year.

The objective of the selection is to achieve a representative, 5% cross section of the fishing effort in each fishing area and during each calendar quarter of the year (a 5% sampling fraction roughly corresponds to 600 sets observed per year). The chance of selecting an individual vessel depends on fishing effort that particular vessel reported by area and quarter in the previous year. Due to the need of a 5% coverage for each quarter and area that the fleet fishes, an individual vessel could be selected for observation as many as four times in a year. However, using the same procedure, a vessel might not be selected at all for the year.

Observer coverage on a vessel becomes mandatory under U.S. fishery regulations when vessel owners and operators, permitted for the fishery, are selected and notified in writing. In the southeast region, a letter of selection signed by the SEFSC Center Director is mailed to the selected fishery permit holder. The NEFSC observer program handled notification of the selected vessels differently.

SELECTION LETTER

The SEFSC selection letter states that the POP coordinator must be notified by the vessel owners/operators, in writing, of each fishing trip directed at swordfish or tuna during the time period stated in the letter. Planning and coordination of observer coverage prior to each trip departure is very important. For convenience, each selection letter is mailed with a trip notification form that, when returned prior to a trip, provides the POP coordinator with written information concerning the vessel's name, captain, contact persons and phone numbers, communications and safety equipment available aboard the vessel, and information about the vessel's location and times of departure and return. The form can also be used to inform the POP coordinator when a vessel is active in another fishery, under repair, or no longer fishing. The written notification is necessary to document the owner's or operator's efforts to comply with mandatory coverage. Telephone calls are helpful, after written notification, to determine other specific details prior to the deployment of the observer to meet the vessel. It is important to keep in mind that observer coverage by the SEFSC is usually for a single trip during the specified calendar quarter, however, additional coverage may be requested if the trip is shorter than expected.

VESSEL NON-COMPLIANCE

The Swordfish Fisheries Management Plan specifies that once notified in writing, the owner and/o the operator must keep the SEFSC informed of their fishing activities and trip departures during the period of selection. Vessel owners/operators must also understand an observer assigned to monitor a fishing trip can be a male or female due to federal regulations prohibiting discrimination in hiring and/or contracting practices. In general, the lack of bathroom facilities, privacy, or sparse living conditions aboard a vessel are not sufficient grounds to prohibit observer coverage by either a male or a female observer. Once arrangements have been made by the SEFSC office to assign an observer to a vessel, the vessel operator must wait until the observer has arrived. Advance notification of departure times and locations can prevent any unnecessary delays. If the vessel departs once observer coverage has been arranged or if the operator rejects an observer present for boarding, this will be documented and the vessel name submitted for non-compliance to the NMFS Southeast Regional Office (SERO) which is responsible for issuing annual permits for participation in the fishery and to the NMFS Enforcement Office responsible for enforcing federal fisheries regulations. Permit holders, owners, and/or operators of vessels can also be identified to SERO for observer non-compliance for non-communication with the coordinator's office (Lack of verbal or written notification of departures or fishing activities), hindrance of the observer in completing his/her data collection duties, and/or harassment during the observed trip. Submission of a vessel owner's or operator's name for observer non-compliance is not taken lightly and is only initiated when the circumstances leave no alternative. However, once submission occurs, actions taken by SERO and NMFS Enforcement office are not controlled by the observer program personnel. It is the intent of this program to seek a good working relationship between the scientific personnel involved in the data collection and the daily routine of the vessel crew.

DATA COLLECTION FORMS

In order to record data needed to describe the catch and effort of the longline fishery, the POP observer must complete three data forms (Appendix 1). The first is called the "Longline Gear Characteristic Log", which is used to record the type of mainline used, length of drop line, number and length of gangions, make and model of hooks used, as well as the number of floats, high fliers, and radio beacons used. The second data form is the "Longline Haul Log", which is used to describe fishing effort. This form allows the observer to record the length, location and time duration for each set and haulback, as well as environmental information, the speed at which the vessel sets the gear, and type of bait used. The last of the data forms is called the "Large Pelagic Individual Animal Log". This data sheet allows the observer to record the species of fish caught, condition of the catch (alive, dead, damaged, or unknown) when brought to the vessel, and the final disposition of the catch (kept, thrown-back, finned, etc.). When an animal is brought onboard the vessel, the observer will verify species identification and record length measurements. A final weight of the carcass is recorded during unloading at the dock. This weight is matched to the length measurements on the data sheets using a specially numbered tag to identify the carcass of primary interest. Similar information is collected by the NEFSC observers aboard longline vessels, as well as for many other gear types and fisheries.

DATA SUMMARY
1992 - 1996

Vessel Coverage

From May, 1992 through December, 1996, scientific observers associated with the SEFSC observed a total of 287 pelagic longline trips in waters of the northwest Atlantic Ocean (Table 1). In total, observers spent 3,362 days at-sea during which 1,838 sets were observed (Figure 2 and Table 1).

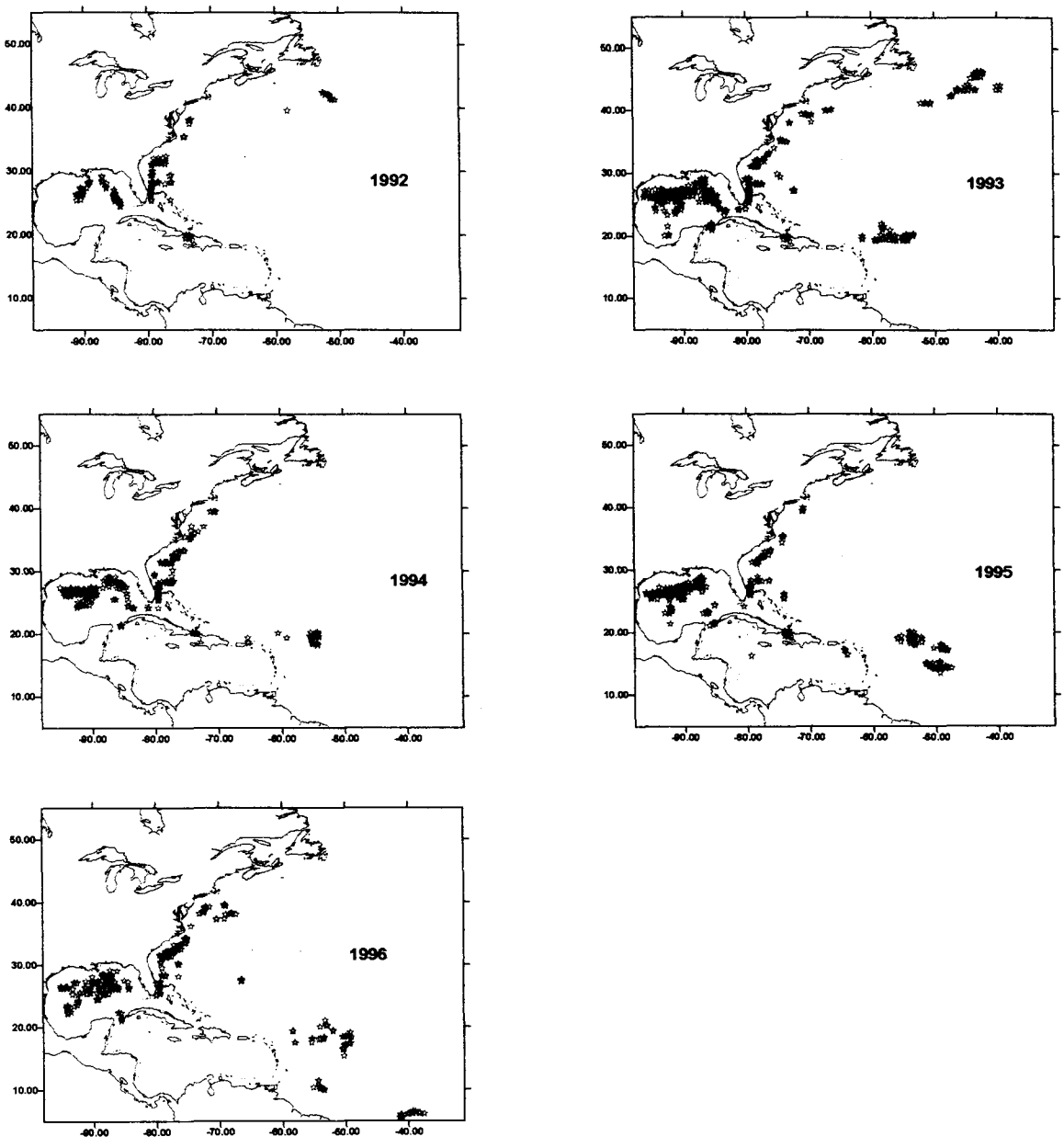

Figure 2. Location of sets observed by SEFSC observers 1992- 1996.

Of the trips monitored, a total of 143 vessels were observed at least once during this time period. Data from 4 trips were excluded from analysis in this report because the gear was set as bottom longline and directed at shark species.

Based on the POP experience, fishing and fishing trips are not predictable. Excluding the difficulties of communication with owners or operators concerning fishing trip departures, scheduling of an observed trip on any selected vessel can also be hindered by mechanical repairs, weather, crew or captain replacement, activity in another fishery, as well as availability of an observer for an observed fishing trip. Given all of the variables that can affect scheduling an observed trip, the POP in the southeast from 1992 to 1996 was successful in observing an overall average of 82% of the required number of sets needed.

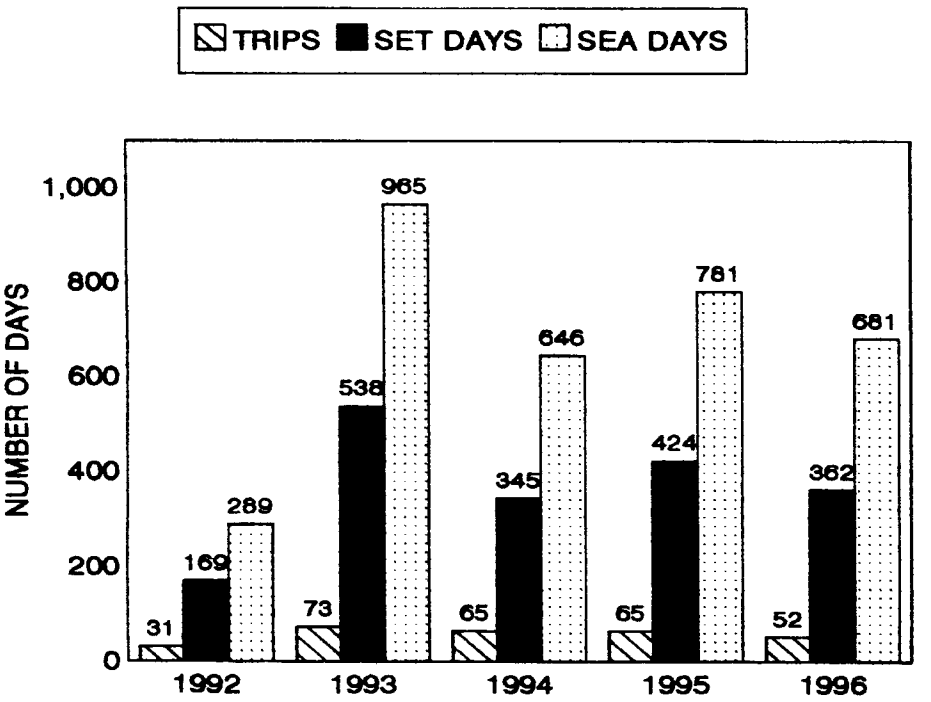

Figure 3. SEFSC observer effort between 1992 - 1996.

Quarterly percent coverage by the SEFSC program ranged from just under 2 percent to over 7 percent during the 5 year period. Given the transit time to and from the fishing grounds and the effort (in days) spent fishing, a POP observer spent an average of 2.8 days at sea for each set observed (Figure 3, Table 1).

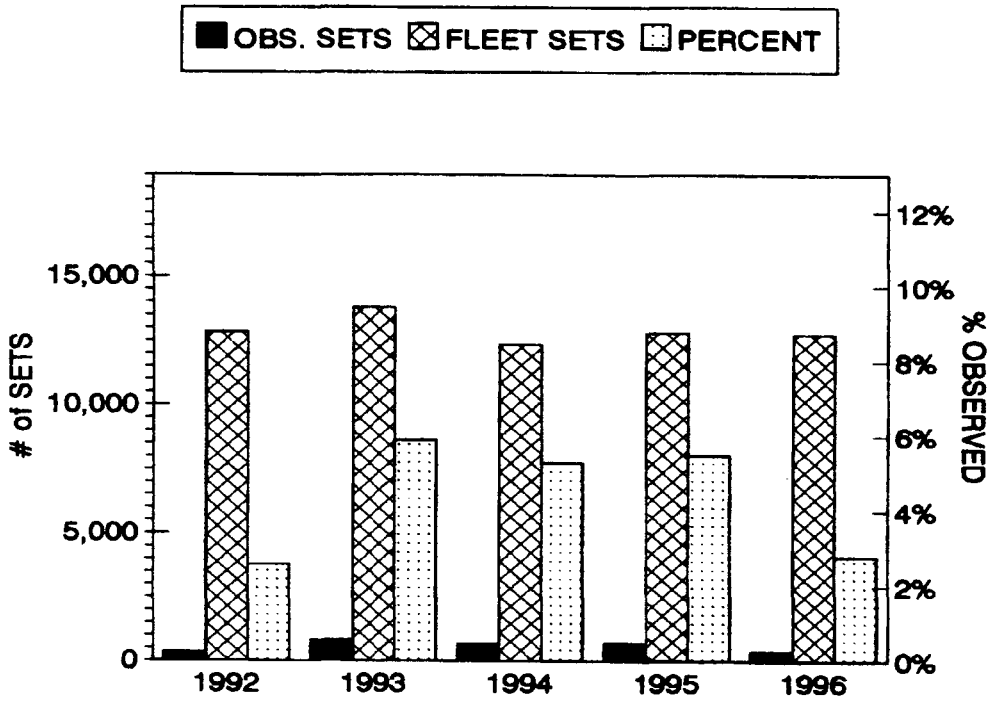

Figure 4. Comparison of total observed sets recorded by SEFSC and NEFSC programs , the sets reported by the U.S. pelagic longline fleet through pelagic logbook forms (excluding sets reported as not using pelagic longline gear and/or targeting species other than swordfish or tunas) and percent coverage achieved by year between 1992 - 1996. (The pelagic logbook effort data for 1996 was not available at this time but was assumed at an average level of 12,750 sets).

Combining both the northeast and southeast programs, the overall average percent coverage was over 4 percent for all years combined (Figure 4). The years in Figure 4 when the percent coverage was over 5 percent (1993-1995), both regional observer programs were operating at funding levels of about $1.2 million per year. The fall off in the percent coverage in 1996 reflects a reduction in funding for the program.

Species Observed

The presence of a scientific observer onboard a commercial longline vessel provides an opportunity for collecting valuable information for monitoring both the fishery and the stocks being harvested. The data forms, as previously mentioned, provide scientists with basic information concerning gear configuration, baits used, number of hooks set, and the environmental parameters associated with a particular set. Equally important, observers record data concerning the species of fish encountered, their size, sex and status (kept, discarded, etc).

Data collected during a fishing trip are entered into a computer usually within 7 days upon the observer's return to port. Data are screened for accuracy during the debriefing meeting with the observer followed by data entry. Audit programs are used by the POP that help to catch data entry errors (e.g. dead fish entered as released alive, etc.). Because of the ongoing refinement of the quality assurance programs, the accuracy of the observer database is increasingly improved .

Summarizing the 1992-1996 catch data, POP and RRA observer personnel identified a total of 50,540 fish, marine mammals, sea turtles and birds to genus or species level (Figure 5; Tables 2 and 3). This total

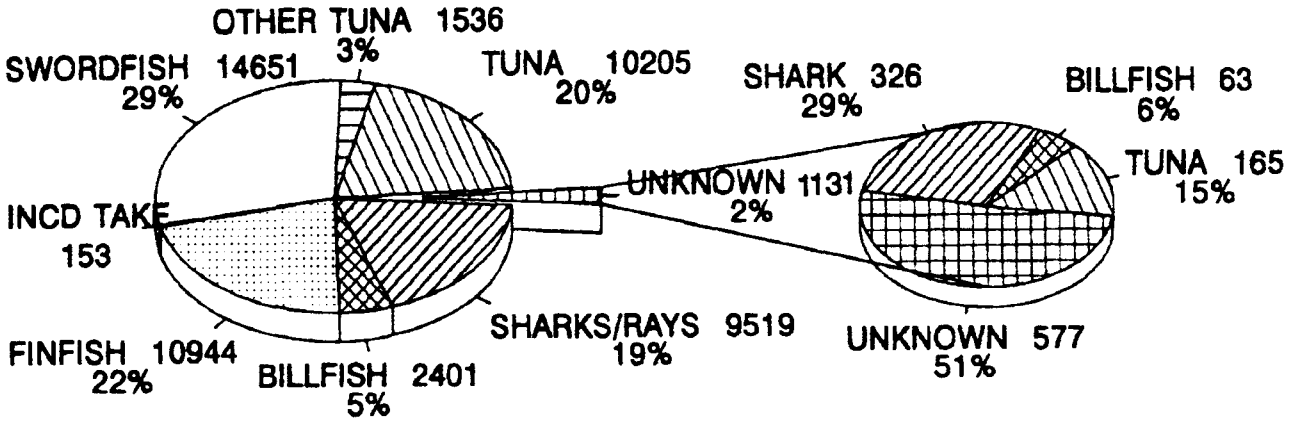

Figure 5. Observer data compiled for 1992-1996 showing number and percent of the 50,540 animals observed by general category groups (except birds and cephalopods). The incidental take (minus sea birds) represents about one third of 1% of the total catch in the POP database. The tuna category is comprised of yellowfin, bigeye and bluefin.

includes 1131 fish in the "UNKNOWN" category that could only be identified to a general fish category, (ie. Unknown tuna, unknown shark, etc) but the observer was able to determine the alive/dead status. In addition, the Incidental Take (INCD TAKE) (Figure 5; Table 3) includes 13 marine mammals (all released alive except two) and 135 sea turtles (all released alive except two). The overall total excludes 6 squid and 6 sea birds (all dead) which were not included in Figure 5.

Although a wide variety of fish were caught by the observed longline vessels, only about six species were routinely valued as a marketable product. These primary species (swordfish, yellowfin tuna, bigeye tuna, bluefin tuna, dolphin (mahi mahi), and shortfin mako) comprise about 59% by number (N=29,890) of the total observed catch. Of the total observed fish (Figure 5), swordfish made up 29% by number of the catch; while yellowfin, bigeye, and bluefin tunas, combined, made up 20% by number of the observed catch. Sharks and rays, a bycatch of the tuna and swordfish fishery, made up the other major portion of the pelagic longline catch, about 19% by number.

Observations of the status (alive/dead) of fish caught is an important component needed for assessing the effectiveness of some fishery management tools, like minimum sizes. The observer records the status (alive, dead, damaged) of the fish as it is brought alongside the vessel (Tables 2 and 3) and whether it is kept or thrown back. From these data, mortality of discards can be estimated. As an example, the percent of swordfish observed brought to the side of the vessel that were dead (Table 2) is 77%, which is slightly (and not statistically) different from the observed percent of swordfish discards which are observed thrown back dead (78%) as indicated in (Table 4). The latter of the values expressed from these tables is meaningful in understanding the mortality of that part of the population that is not represented in the landed catch. In general, these proportions are similar to the alive/dead proportions for various Atlantic pelagic species caught on longline reported in the literature (Farber and Lee, 1991; Hoey, 1992; Lee et al., 1994, 1995).

As mentioned, coverage of the selected vessels using POP observers was not limited only to the Atlantic waters of the southeast U.S., rather the POP observed coverage (Figure 2) took place in nine of the 11 geographical areas (Figure 1) used in analysis of these data. Sampling by NEFSC sponsored observers is not included in this summary, but overlaps in geographical regions did exist for 1992-1994. Most all of the NEFSC observer data were collected in waters north of North Carolina. As an overview of the observed longline gear deployed, the shortest average length of mainline set on an observed trip was 4.3 nautical miles (NM) while the longest average set during a trip was 40.0 NM. Additionally, of the 1,838 sets observed, a total of 1,131,808 hooks were recorded during this period (Table 1).

Hook fishing depth (ie. length of float line plus length of gangion) is a fishing technique of the gear which is quite variable among vessel operators. It should be understood that actual fishing depth of the baited hook is unknown due to influences by ocean currents and environmental conditions. However, given an assumed fishing depth based on float line and gangion length, general trends in this technique can be found depending on the geographic areas where fishing takes place.

The average minimum and maximum depths of the baited hooks are similar for the GOM, SAB, and the FEC (Table 5), with a range from 19 and 45 fathoms (35-83 m) for the three geographical areas. Vessels observed fishing in the waters off the southeast U.S. (FEC and SAB) target mostly swordfish, with yellowfin generally found as a by-catch, whereas, observed vessels in the GOM primarily target yellowfin tuna with a by-catch of swordfish. In examining such trends, it appears yellowfin tuna and swordfish overlap in their habitat and depth availability. Also to be considered, the trend in fishing a percentage of the longline gear closer to the surface in the SAB and the GOM in recent years (1995-96) may begin to become more significant because of the seasonal appearance and economic impact of the dolphinfish (mahi) in these areas.

In the northeast Atlantic region (MAB, NEC and NED), POP data indicated that hook depths during observed trips were shallower (Table 5), ranging from 10 to 23 fathoms (18-43 m). Generally speaking, observed vessels fishing in the waters of the MAB and NEC target more on the tuna species while the NED is typically directed more at swordfish. A comparison of our data with the NEFSC should be examined to confirm this observation.

In the subtropical Atlantic region (CAR and ATL), hooks are fished the deepest (Table 5), with depth ranging from 31 to 46 fathoms (57-85 m). Observed vessels in these regions are in waters over the deep submarine trenches, the open waters of the mid-Atlantic ridge, and at convergence zones of various oceanic currents. Observer data indicates that gear set from these vessels use light sticks and target primarily swordfish although the catches of swordfish and tuna species (yellowfin, bigeye, and albacore tunas) are about equal. As vessels move south of about 13° north latitude in the Atlantic, data indicates that yellowfin tuna becomes the primary target species. Data collected during 1996 and 1997 by POP observers on the vessels in the TUN or TUS regions will be analyzed at a later time to determine if gear is fished differently in those areas.

Observers also recorded various kinds of bait (species) used during fishing activities. Generally speaking, the techniques of fishing "dead bait" (bait brought aboard the vessel frozen and then thawed prior to use) is the prevalent bait method used in all geographical areas (Table 5). On any given set, most crews fish a single species of bait. The primary "dead bait" species recorded for observed sets were Atlantic mackerel (*Scomber scombrus)* and squid (*Illex* sp*)*. Other frozen baits recorded on some of the trips observed, were fish from Clupeidae (herring and shad) or Carangidae (scad) families. Although the technique of placing "dead bait" on hooks is used in the Gulf of Mexico, another baiting technique commonly observed on the Asian-American vessels in that region is the use of "live bait". These "live bait" species, caught at sea near oil platforms, are kept alive onboard the vessels in holding tanks. The vessel crews are opportunistic as to the bait utilized and are concerned more with availability and quantity of bait than a preference for a particular bait. Therefore, this technique can use multiple species for a given set or fishing trip. The predominant "live bait" species utilized by the Asian-American fleet include: bigeye scad (*Selar crumenophthalmus*), chub mackerel (*Scomber japonicus*), and Spanish sardines (*Sardinella aurita*).

As previously reported in Lee et al. (1995), squid and mackerel continue to be the preferred species (90% of sets observed) associated with the "dead bait" technique used by the longline fishery for all areas. (Table 5). Based on the combined (1992 - 1996) POP database, squid was the primary bait in all geographical areas except the FEC, where the use of squid and mackerel are more equally distributed. In the GOM area where both baiting techniques occur, only 23% of the sets observed used the "live bait" technique. The "live bait" technique is used primarily by the Asian-American fishers targeting yellowfin tuna as their primary interest. Although the capture of "live bait" continues to be the preferred technique within this community, observers indicate an increase in vessels taking some "dead bait" to be utilized when "live bait" is limited in availability.

RESEARCH STUDIES UNDERWAY

Swordfish Reproduction

The SEFSC Observer Program have supported an Atlantic swordfish reproductive study that was initiated in 1990 under the direction of the NMFS Miami Laboratory. The principle investigator, Dr. Freddy Arocha, was successful in completing his doctoral study of the swordfish reproductive biology in December, 1996, from the reproductive tissues collected over this time period (Arocha, 1997). Between April, 1990, and June, 1995, over 14,000 gonad samples were collected for this study from swordfish caught by longline, gillnet, and pair trawl fishing gear, through the cooperation of various captains and crews, and personnel from the observer programs sponsored by the NEFSC, the SEFSC, and the Fondo Nacional de Investigaciones Agropecuaries in Venezuela. For the purpose of maturity staging, histology, and fecundity estimates, Dr. Arocha, examined gonadal material from 2,884 females (65-300 cm LJFL) and 955 males (65-265 cm LJFL). Some of the results from the study follow:

1) Peak spawning of female swordfish in the western North Atlantic takes place from December to June between 14^{o} and 35^{o} N latitude.

2) The spawning population seems to form two groups: one group consists of larger and older females that are associated with open waters located south of Sargasso Sea and east of the Antillean Arc; and the second consists of mid-sized, younger specimens associated with waters close to land masses and strong currents, such as the Windward Passage, Yucatan Channel, and Straits of Florida.

3) Female swordfish in the study matured at about 178 cm (70 inches) LJFL and fully matured by 209 cm (82 inches) LJFL, estimated ages of 5 and 8 years and dressed weights of 121 lbs and 198 lbs, respectively. Male swordfish matured at 128 cm (50 inches) LJFL and fully matured at 165 cm (65 inches) LJFL, estimated ages of 3 and 6 years and dressed weight of 42 lbs and 94 lbs, respectively.

4) During the seven month spawning season, female swordfish were determined to be multiple spawners producing ova (eggs) in batches for dispersion, with an average spawning frequency of 81.5 times or about one spawn every three days.

5) Of the 29 swordfish ovary pairs that were collected and weighed during this study, batch fecundity estimates of the hydrated ova (ready to spawn eggs) ranged from 995,067 ova from a 166 cm (LJFL) and 108 lbs (dwt) specimen to just over 9 million ova from a 245 cm (LJFL) and 240 lbs specimen. The largest specimen at 203 lbs (dwt) had a batch fecundity estimate of 8.7 million ova.

Although the above information are just a few of the highlights from Dr. Arocha's 383 page dissertation, a summary of his results may be reported at later ICCAT meetings. A similar reproductive study on yellowfin tuna will be undertaken by the SEFSC Miami Laboratory observer program is planned for 1998.

Tag Release and Recapture Highlights:

The Cooperative Tagging Center (CTC) is located at the Miami Laboratory, Miami, FL. The purpose of the CTC is to provide tags to those wishing to participate in the tag release program. In order to study the movements, as well as gain insight into growth rate and longevity of highly migratory species, the CTC needs the assistance of individuals and organizations that are willing to tag on a voluntary basis. Although Dr. Eric Prince is the CTC project leader and the primary contact person, the Miami Laboratory has also designated Mr. Dennis Lee as a contact for the commercial fishing community. For the purpose of providing a large number of tags (not to exceed 50 tags per request) to the commercial fishing community, fishermen are asked to contact Mr. Lee at the Miami Laboratory. For persons tagging for the first time, a form will be provided which will need to be completed and mailed to the Miami Laboratory. Once the form has been received, a minimum of 25 tags will be provided the first time. If a tagger is already in the CTC database, up to 50 tags may be issued at one time. Keep in mind, however, that the Miami Laboratory reserves the right to limit tag quantity provided.

As mentioned, tag recaptured fish are extremely important in providing information needed for studies of age, growth, migration and mortality rates of fish populations. Because the observer or the captain and crew do not have ready access to tag release data, all dead fish with a tag should be considered extremely important. Examples of the types of information obtained from recaptured fish follow:

1) A tag-recaptured shortfin mako was recently caught in February, 1997, by a longline vessel while a SEFSC observer was aboard. From the tag recapture number (#A10347), which the observer turned in for the captain, it was determined that the mako had been at large for 4,670 days (12.8 years). This not only extended the time at-large for this species, but because vertebral centrum were collected by the observer, age validation for this species can be attempted.

2) A longline captain that has participated in the tagging program for many years, recaptured a swordfish in 1996 (tag #101419) that had been at-large for 3,487 days (9.5 years). It had been tagged by a longline observer SE of Martha's Vineyard, MA, and recaptured nearly in the same location .

3) A longline captain that does not participate in tagging but was aware of the tagging program, recaptured a swordfish in 1996 (tag #120409) that had been at-large for 3,408 days (9.3 years). It had been tagged by a longline observer just off Provincetown, MA, and recaptured in the Windward Passage.

The above are just a few of the significant events in our tagging files. It is important for everyone to understand that the recapture of a tagged fish can be a treasure chest of information and lend much insight into the life history biology of a fish. In some cases, it can extend what we know about a fish's longevity. We appreciate all those that do participate and are willing to assist anyone who wants to get started.

Estimates of marine mammal and turtle mortality

Scientists at the SEFSC Miami Laboratory produced a report with estimates of marine mammal and turtle catches for 1994 and 1995 using both pelagic logbook data and observer data collected by the SEFSC and NEFSC regional programs (Scott and Brown, 1997). The estimates were constructed using published statistical methodology taking into account possible geographical and time of year effects. Robustness of the estimates to geographical and time of year effects were examined by pooling across strata. The most precise estimates indicate that the US pelagic longline fleet operating in the northwest Atlantic Ocean caught 216 (111-484, 95% confidence intervals [CI]) marine mammals in 1994 and 286 (172-522, 95% CI) marine mammals in 1995. Of these, it is estimated that no (0) marine mammals in 1994 and 7 (1-36, 95% CI) Risso's dolphins (*Grampus griseus*) in 1995 were dead upon return to the sea. Most of the estimated catch of marine mammals came from US Atlantic Exclusive Economic Zone (EEZ) waters between the state borders of South Carolina and Cape Code, Massachusetts. It is also estimated that the fleet caught 2,166 (1,558-3,033, 95% CI marine turtles in 1994 and 2,841 (2,127-3,824, 95% CI) marine turtles in 1995. Of these, it is estimated that 8 (1-41, 95% CI) loggerhead turtles (*Caretta caretta*) in 1994 and no(0) marine turtles in 1995 were dead upon return to the sea. Most of the estimated catch of marine turtles came from the North Atlantic fishing area (Grand Banks) outside of the US EEZ.

ACKNOWLEDGMENTS

The Miami Laboratory, Pelagic Observer Program is grateful to vessel owners, operators, and crews that have participated in the observer program. Without their overall cooperation, the collection of catch and effort data, as well as biological samples would have been difficult. Special acknowledgment is given to the help provided by port agents and observer personnel of the SEFSC and NEFSC, as well as observer personnel form Manomet Observatory, RRA, and FONAIAP. We also graciously thank the captains, crews, and individuals associated with the Blue Water Fishermen's Association in providing assistance to the program research activities.

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For more information

Information on the observer program or for scheduling an observer trip, please contact the Pelagic Observer Program Coordinator, Dennis Lee:

(Office) 800 858-0624 (FAX) 305 361-4562

Address: Southeast Fisheries Science Center
Miami Laboratory
75 Virginia Beach Drive
Miami, FL 33149

General information or questions about programs concerning dealer reporting, logbook submission, or the tagging program, persons should contact the NMFS Miami Laboratory's main office telephone number (305) 361-4200. The following contact persons are provided:

DEALER REPORTING: John Poffenberger or Andy Bertolino
PELAGIC LOGBOOK REPORTING: Ernie Snell
GAMEFISH TAGGING PROGRAM: Dr. Eric Prince - 800 473-3936
Fish tagging liaison (commercial fisheries): Dennis Lee 305 361-4247

Information on fishing permits or regulation should be directed to the NMFS Southeast Regional Office, St. Petersburg, FL. or Northeast Regional Office Gloucester, MA.

REGULATIONS AND PERMITS BRANCH: (813) 570-5326
FISHERIES OPERATIONS BRANCH: (813) 570-5305

National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive, N
St. Petersburg, FL 33702

TUNA PERMITS: 1-888-872-8862 (automated)
TUNA PERMITS CUSTOMER SERVICE: 1-800-663-3879

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

Table 1. Number of vessels covered, sets observed, total hooks set, days spent at sea, and percent of sets observed from the total sets required for 5% coverage of the fishing effort by quarter from 1992 to 1996.

SEFSC OBSERVER COVERAGE
1992 - 1996

YEAR	CALENDAR QUARTERS	VESSELS COVERED	SETS OBSERVED	TOTAL HOOKS SET	DAYS AT-SEA	% of SETS REQUIRED
1992	2	8	45	13,773	66	27%
	3	10	36	13,334	63	32%
	4	13	88	52,122	160	>100%
	Total	31	169	79,229	289	
1993	1	17	143	98,383	264	>100%
	2	22	165	98,105	246	>100%
	3	22	138	95,401	298	>100%
	4	13	92	59,084	157	>100%
	Total	73	538	305,973	965	
1994	1	15	97	54,252	209	86%
	2	17	85	48,046	163	84%
	3	17	86	44,633	139	72%
	4	16	77	43,894	135	69%
	Total	65	345	190,825	646	
1995	1	13	134	92,430	219	>100%
	2	20	137	89,532	224	>100%
	3	19	86	61,387	184	83%
	4	13	67	43,249	154	83%
	Total	65	424	286,598	781	
1996	1	12	112	68,252	215	81%
	2	13	75	43,697	137	63%
	3	15	99	69,556	185	77%
	4	12	76	42,678	144	62%
	Total	52	362	224,183	681	
	Overall	**287**	**1,838**	**1,131,808**	**3,362**	**82%**

1

$$\%Sets = \frac{Sets\ Observed}{Sets\ Required} X\ 100$$

Table 2. Numbers of alive, dead, and damaged (shark bitten) swordfish, billfish, tunas, and sharks when brought along side the boat as recorded by POP observers while deployed aboard U.S. pelagic longline vessels from 1992 to 1996.

GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
SWORDFISH	SWORDFISH	2,673	11,272	697
TUNA	BIGEYE	923	743	76
	BLUEFIN	42	91	3
	YELLOWFIN	4,576	3,138	603
BILLFISH	ATLANTIC SAILFISH	352	494	39
	MARLIN BLUE	442	212	18
	MARLIN WHITE	356	318	16
	SPEARFISH LONGNOSE	29	54	1
	SPEARFISH SPP.	26	42	0
SHARKS				
Small Coastal	ATLANTIC SHARPNOSE	9	22	0
Large Coastal	BIGNOSE	8	20	1
	BLACKTIP	8	25	0
	BULL	15	8	0
	DUSKY	300	266	4
	HAMMERHEAD GREAT	11	21	0
	HAMMERHEAD SCALLOPED	84	159	8
	HAMMERHEAD SMOOTH	1	3	0
	HAMMERHEAD SPP.	20	9	1
	NIGHT	23	60	1
	REEF	4	2	0
	SAND TIGER	3	1	0
	SANDBAR	149	30	0
	SILKY	513	851	14
	SPINNER	6	3	0
	TIGER	232	6	0
Pelagic	BLUE	3,216	909	7
	CROCODILE	79	25	1
	MAKO LONGFIN	22	21	0
	MAKO SHORTFIN	245	116	3
	MAKO SPP.	1	0	0
	PORBEAGLE	4	2	0
	THRESHER	4	4	0
	THRESHER BIGEYE	64	81	0
	THRESHER COMMON	8	5	0
	WHITETIP OCEANIC	153	64	0
OTHERS	SKATES/RAYS	1,570	9	1
	COLLARED DOGFISH	1	1	0

Table 3. Numbers of alive, dead, and damaged (shark bitten) finfish, other tunas, marine mammals, marine turtles and unknown species groups when brought along side the boat as recorded by POP observers while deployed aboard U.S. commercial longline vessels from 1992 to 1996

GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
TUNA OTHER	ALBACORE	54	516	14
	BLACKFIN	138	314	18
	BONITO	4	30	2
	LITTLE	23	142	3
	SKIPJACK	7	265	6
FINFISH	AMBERJACK SPP.	2	0	1
	BARRACUDA	81	15	2
	BIGEYE CIGARFISH SPP.	27	42	1
	BLUEFISH	3	2	0
	COBIA	2	0	0
	DEALFISH	0	3	0
	DOLPHIN FISH SPP.	3,777	847	65
	ESCOLAR	932	1,223	65
	JACK SPP.	2	1	0
	LANCETFISH SPP.	462	1,636	285
	MACKEREL CHUB	0	5	0
	MACKEREL KING	0	2	0
	MACKEREL SNAKE	17	86	8
	OILFISH	205	147	7
	OPAH	3	13	0
	POMFRET SPP.	74	69	3
	PUFFER SPP.	44	5	1
	REMORA	3	1	0
	SNAPPER BLACKFIN	0	1	0
	SUNFISH SPP.	107	1	0
	TRIGGERFISH	3	0	0
	WAHOO	92	522	30
MARINE MAMMAL	DOLPHIN ATLANTIC SPOTTED	1	0	0
	DOLPHIN BOTTLENOSE	1	0	0
	DOLPHIN PANTROPIC SPOTTED	1	0	0
	DOLPHIN RISSOS	7	2	0
	MARINE MAMMAL	2	0	0
	PILOT WHALE	4	0	0
MARINE TURTLE	TURTLE	6	0	0
	TURTLE GREEN	3	0	0
	TURTLE LEATHERBACK	82	1	0
	TURTLE LOGGERHEAD	42	1	0
UNKNOWN	BILLFISH	34	18	10
	SHARK	263	59	3
	TUNA	12	10	142
	UNKNOWN	444	34	32

Table 4. Numbers of alive and dead[1] fish of 6 species recorded by POP observers while deployed aboard U.S. commercial longline vessels from 1992 to 1996.

COMMON NAME	DISCARDED		PROPORTION DEAD
	ALIVE (A)	DEAD (D)	D / (D + A)
Swordfish	1,359	4,911	0.783
Bigeye Tuna	130	189	0.592
Yellowfin Tuna	224	682	0.753
Blue Marlin	442	230	0.342
White Marlin	337	353	0.512
Sailfish	326	559	0.632

1) DEAD = Dead + Damaged fish

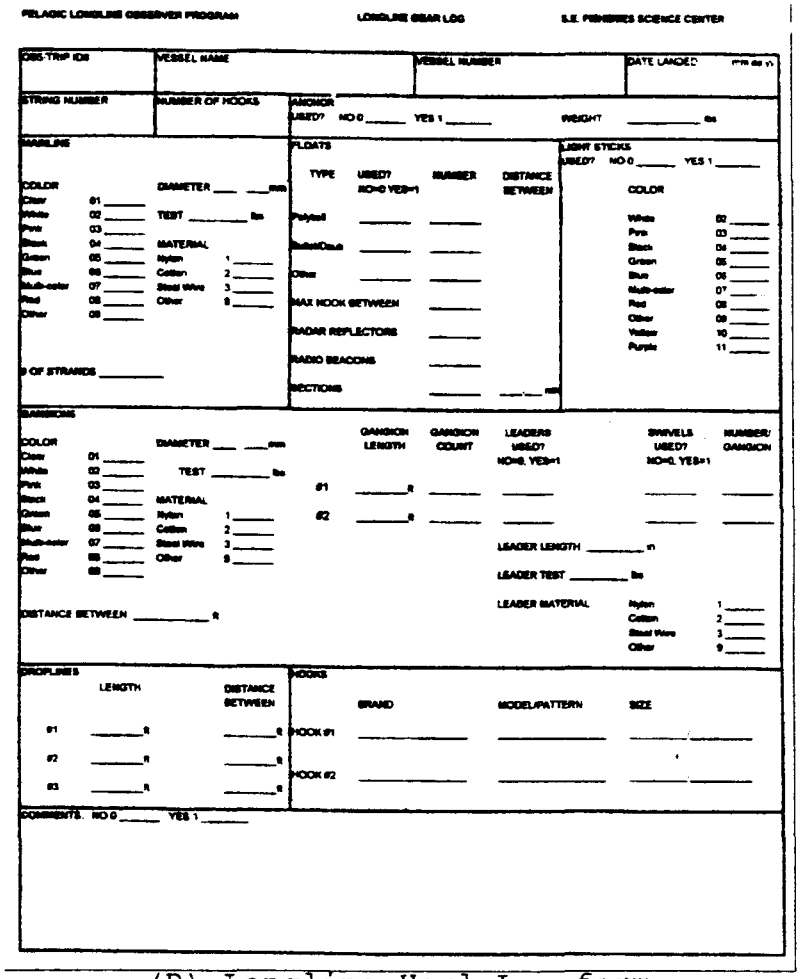
Table 5. Observed average hook depth (minimum and maximum in fathoms) and kind of baits used (in numbers of sets aboard U.S. commercial longline vessels by geographical area (Figure 1). Baits used were: Atlantic mackerel (*Scomber scombrus*)=M, squid (Illex sp.)=Sq, herring (*Clupeidae sp.*)=H, Spanish sardine (Sardinella aurita)=Sa, bigeye scad (*Selar Crumenophthalmus*)=Sc, and other =O (species not identified). Bait type indicates sets fished using dead bait (stored frozen then thawed) and live bait (bait caught at sea and alive on hook).

Areas Fished	Total Sets	Average Hook Depth (fathoms)		Bait Kind (by numbers of sets)						Bait Type	
		MIN	MAX	M	Sq	H	Sa	Sc	O	DEAD	LIVE
CAR	140	32	46	21	119	0	0	0	0	140	0
GOM	790	25	45	96	315	56	176	124	3	609	181
FEC	273	19	35	123	148	0	2	0	0	273	0
SAB	241	19	33	77	164	0	0	0	0	241	0
MAB	61	14	23	7	54	0	0	0	0	61	0
NEC	20	10	20	10	20	0	0	0	0	30	0
NED	72	10	18	0	72	0	0	0	0	72	0
ATL*	231	31	43	6	225	0	0	0	0	231	0

*Combines areas SAR, NCA and TUN

APPENDIX 1

(A) Longline Gear Characteristic Log form



PELAGIC LONGLINE OBSERVER PROGRAM — LONGLINE GEAR LOG — S.E. FISHERIES SCIENCE CENTER

OBS TRIP ID | VESSEL NAME | VESSEL NUMBER | DATE LANDED (mm dd yr)

STRING NUMBER | NUMBER OF HOOKS | ANCHOR USED? NO 0 ____ YES 1 ____ | WEIGHT ____ lbs

MAINLINE
COLOR: Clear 01, White 02, Pink 03, Black 04, Green 05, Blue 06, Multi-color 07, Red 08, Other 09
DIAMETER ___ ___ mm
TEST ____ lbs
MATERIAL: Nylon 1, Cotton 2, Steel Wire 3, Other 9
OF STRANDS ____

FLOATS

TYPE	USED? NO=0 YES=1	NUMBER	DISTANCE BETWEEN
Polyball			
Buoy/Buoy			
Other			

MAX HOOK BETWEEN
RADAR REFLECTORS
RADIO BEACONS
SECTIONS ____ ___ mm

LIGHT STICKS USED? NO 0 ____ YES 1 ____
COLOR: White 02, Pink 03, Black 04, Green 05, Blue 06, Multi-color 07, Red 08, Other 09, Yellow 10, Purple 11

GANGIONS
COLOR: Clear 01, White 02, Pink 03, Black 04, Green 05, Blue 06, Multi-color 07, Red 08, Other 09
DIAMETER ___ ___ mm
TEST ____ lbs
MATERIAL: Nylon 1, Cotton 2, Steel Wire 3, Other 9
DISTANCE BETWEEN ____ ft

	GANGION LENGTH	GANGION COUNT	LEADERS USED? NO=0, YES=1	SWIVELS USED? NO=0, YES=1	NUMBER/ GANGION
#1	____ ft				
#2	____ ft				

LEADER LENGTH ____ in
LEADER TEST ____ lbs
LEADER MATERIAL: Nylon 1, Cotton 2, Steel Wire 3, Other 9

DROPLINES

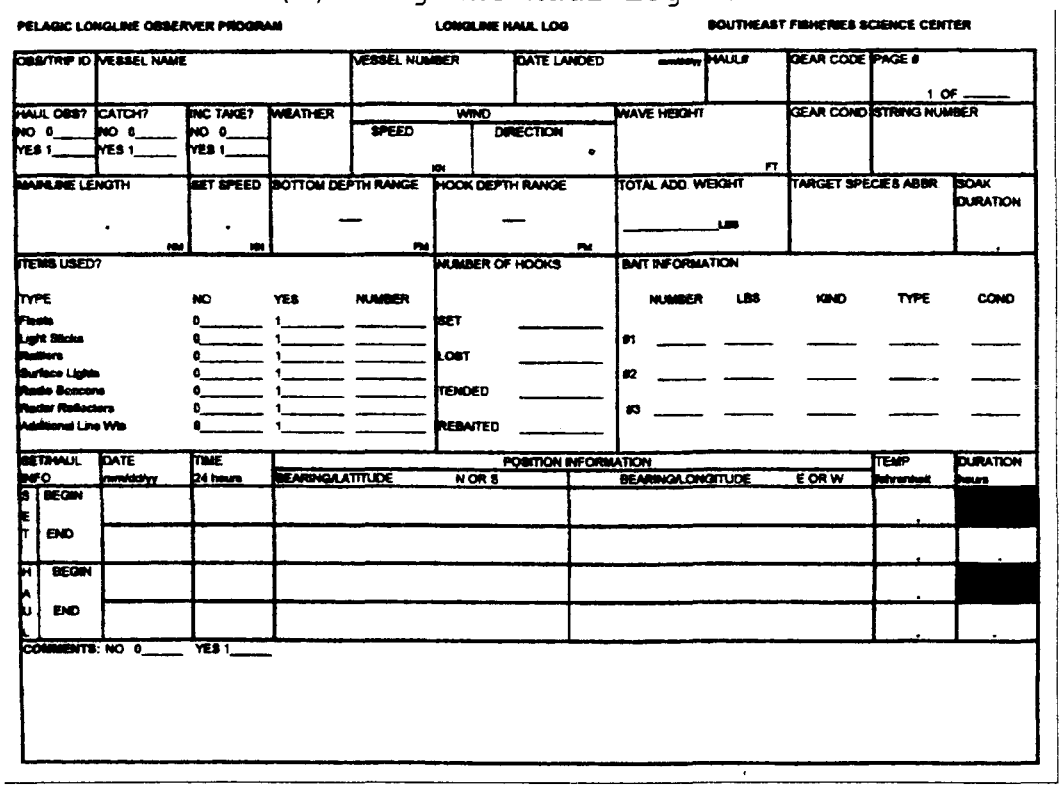
	LENGTH	DISTANCE BETWEEN
#1	____ ft	____ ft
#2	____ ft	____ ft
#3	____ ft	____ ft

HOOKS

	BRAND	MODEL/PATTERN	SIZE
HOOK #1			
HOOK #2			

COMMENTS: NO 0 ____ YES 1 ____

(B) Longline Haul Log form



PELAGIC LONGLINE OBSERVER PROGRAM — LONGLINE HAUL LOG — SOUTHEAST FISHERIES SCIENCE CENTER

OBS/TRIP ID | VESSEL NAME | VESSEL NUMBER | DATE LANDED (mm/dd/yy) | HAUL# | GEAR CODE | PAGE # 1 OF ____

HAUL OBS? NO 0 ____ YES 1 ____ | CATCH? NO 0 ____ YES 1 ____ | INC TAKE? NO 0 ____ YES 1 ____ | WEATHER | WIND SPEED ____ KN DIRECTION ____ ° | WAVE HEIGHT ____ FT | GEAR COND | STRING NUMBER

MAINLINE LENGTH ____ KM | SET SPEED ____ KN | BOTTOM DEPTH RANGE ____ FM | HOOK DEPTH RANGE ____ FM | TOTAL ADD. WEIGHT ____ LBS | TARGET SPECIES ABBR | SOAK DURATION ____

ITEMS USED?

TYPE	NO	YES	NUMBER
Floats	0 ____	1 ____	____
Light Sticks	0 ____	1 ____	____
Radars	0 ____	1 ____	____
Surface Lights	0 ____	1 ____	____
Radio Beacons	0 ____	1 ____	____
Radar Reflectors	0 ____	1 ____	____
Additional Line Wts	0 ____	1 ____	____

NUMBER OF HOOKS
SET ____
LOST ____
TENDED ____
REBAITED ____

BAIT INFORMATION

	NUMBER	LBS	KIND	TYPE	COND
#1					
#2					
#3					

SET/HAUL INFO		DATE (mm/dd/yy)	TIME (24 hours)	POSITION INFORMATION: BEARING/LATITUDE	N OR S	BEARING/LONGITUDE	E OR W	TEMP (fahrenheit)	DURATION (hours)
SET	BEGIN								
	END								
HAUL	BEGIN								
	END								

COMMENTS: NO 0 ____ YES 1 ____

APPENDIX 1 (CONTINUED)

(C) Large Pelagics Individual Animal Log form

NOAA FISHERIES - SEA SAMPLING PROGRAM
LARGE PELAGICS INDIVIDUAL ANIMAL LOG

01/07/93

Obs/Trip Ident.	Vessel Name	Vessel Number	Date of Haul (m/d/y) ___/___/___	Haul Number	Page ___ of ___

CARCASS Tag Number	SPECIES		No. Fishes Taken	STATUS Unknown (0) Alive (1) Dead (2) Damage (3)	Keys (1) Released (2 or 3) Filleted (4) Lost (5) Finned (6)	LENGTH MEASUREMENTS (cm)				Actual Dressed Weight (Lbs)	SEX U (0) M (1) F (2)	TAG INFORMATION Number	TR (1) TT (2) BC (3)	Est. Wgt (lbs)
						Standard		Alternate						
	Name (Abbr.)	Code				01	02	Length	Code					