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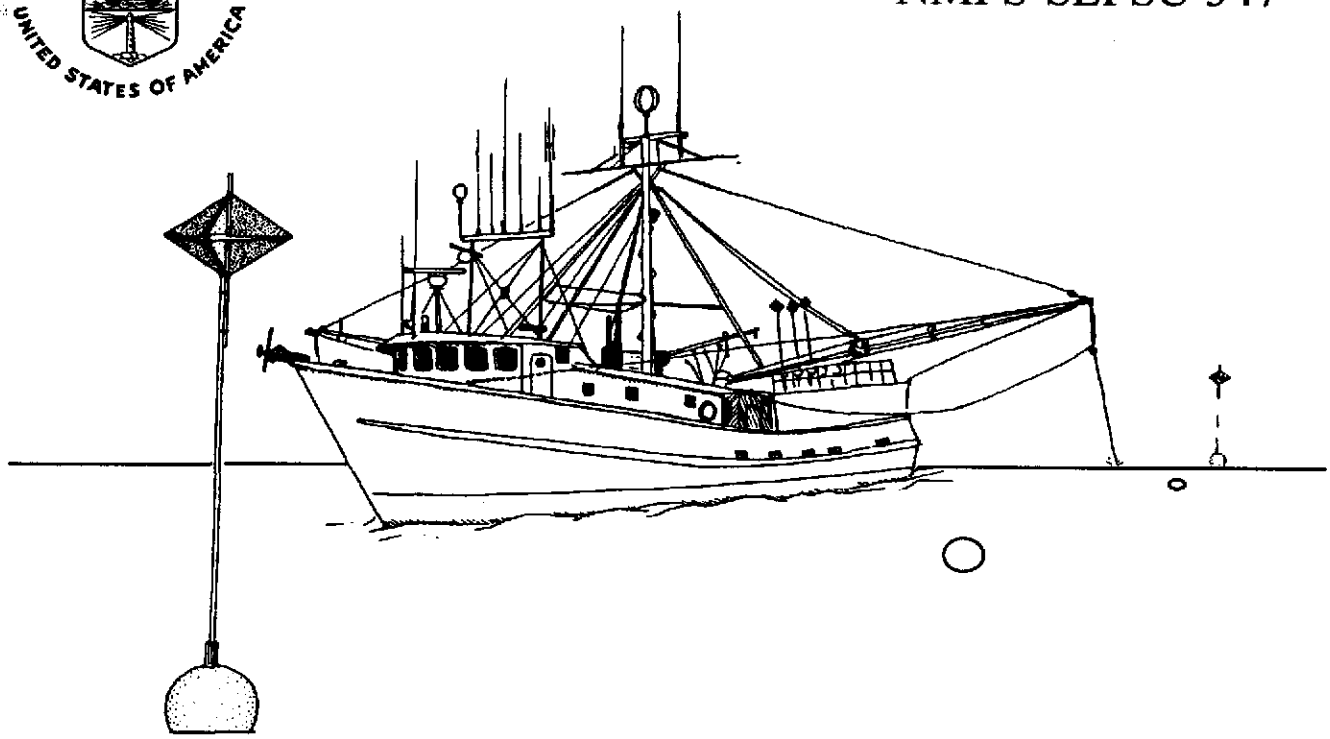
NMFS-SEFSC-347



SEFSC PELAGIC LONGLINE OBSERVER PROGRAM DATA SUMMARY FOR 1992-1993

Dennis W. Lee, Cheryl J. Brown, Albert J. Catalano
Justin R. Grubich, Thomas W. Greig, Robert J. Miller,
and Michael T. Judge

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
Miami, Florida 33149

April 1994

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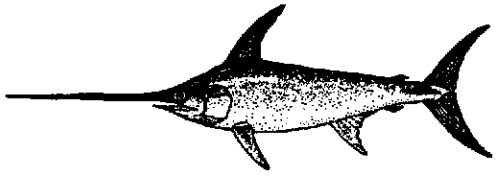

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APRIL 1994

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Lee, et al. 1994. SEFSC Pelagic Longline Observer Program Data Summary for 1992-1993. NOAA TECHNICAL MEMORANDUM NMFS-SEFC-347:19p.

Contribution MIA-93/94-30 from the Southeast Fisheries Science Center, Miami Laboratory, Oceanic Pelagic Division.

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INTRODUCTION

The National Marine Fisheries Service (NMFS) initiated, in early 1992, scientific sampling of the U.S. large pelagic fisheries 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). This newsletter describes the activities of the SEFSC Pelagic Longline Observer Program (PLOP). The PLOP coverage generally occurs on, but is not limited, to vessels fishing in the Atlantic south of Virginia. The scientific observer program contracted and monitored by the NEFSC provides coverage of the large pelagic fleet fishing the waters of the Mid-Atlantic Bight to the Grand Banks.

Operating in association with the PLOP, the Louisiana State University (LSU; Baton Rouge, LA) observer program funded through a NMFS Marine Fisheries Initiative grant (MARFIN) has been vital in helping to describe the longline fishery in the Gulf of Mexico. LSU observers, who received training at the SEFSC Miami facility and collect similar data, have made a major contribution in the collection of data from the Gulf of Mexico. Observers from LSU concentrate primarily on the Louisiana Mississippi River Delta ports because of their familiarity with vessel operations within that area. In addition to LSU, four field observers, hired through independent contracts and trained at the SEFSC Miami facility, are also available on an individual trip by trip basis. These contracted field observers are generally placed on vessels with fishing trips over 25 days in length.

Under our program, the 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. Observers also record incidental interactions 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 the fish biology and life history behavior.

The data collected by both NMFS regional programs are used by scientists in a variety of ways. The observer catch and effort data will help confirm and augment the information provided through the mandatory submission of the Pelagic Logbook forms by vessel owners and operators. This information will also be important in evaluating effectiveness of management measures, as well as provide information for evaluation of status of the fish populations.

The purpose of this document is to provide a general overview of the PLOP program and summary of those data collected in the southeast region from May, 1992, through December, 1993.

VESSEL SELECTION

Observer coverage is mandatory for selected vessel owners and operators permitted to participate in the fishery. In the southeast region, a written notification of

selection (a selection letter) signed by the SESFC Center Director is sent via registered mail. The NEFSC observer program handles notification of vessel selection differently.

In order to obtain a representative, scientific sample of the fleet, a list of randomly selected vessels to be notified is generated for each geographical area (Figure 1) and quarter for the current year using fishermen's reports of their effort from the Pelagic Logbook sheets from the previous year. The objective of the selection is to achieve a random, 5% cross section of the fleet in each area and quarter. The chance of selecting an individual vessel depends on how much fishing that vessel reported in the previous year. Because of the need of a 5% coverage for each quarter and area the fleet fishes, an individual vessel could be selected for observation as many as 4 times in a year. By the same procedure, a vessel might not be selected at all for the year.

SELECTION LETTER

The SEFSC selection letter states that the observer program coordinator must be notified by the vessel owners or operators, in writing, of their fishing trips during the quarter period stated in the letter. Planning and coordination of observer coverage prior to each trip departure is important. For convenience, each selection letter is mailed with a trip notification form that, when returned prior to a trip, provides the PLOP coordinator with written information concerning the vessel's name and 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 program coordinator when a vessel is active in another fishery, under repair, or no longer fishing. The written notification is also necessary to document the owner's or operator's efforts to comply with mandatory coverage. Telephone calls are also helpful, after written notification, to determine other specific details prior to the departure of the observer to meet the vessel. It is important to keep in mind that observer coverage is for a single trip during the specified calendar quarter.

DATA COLLECTION FORMS

In order to record data necessary to describe the catch and effort of the fishery, the 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 number of floats, high fliers, and radio beacons used. The second data form is the Longline Haul Log, which is used to describe the effort being used. This form allows the observer to record the length, location and time duration for the set and haulback, 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 (alive, dead, damaged, or unknown) of the fish when brought to the vessel, and the final disposition of the fish (kept, thrown-back, finned, etc.). When a fish is brought onboard the vessel, the observer will verify the species and records

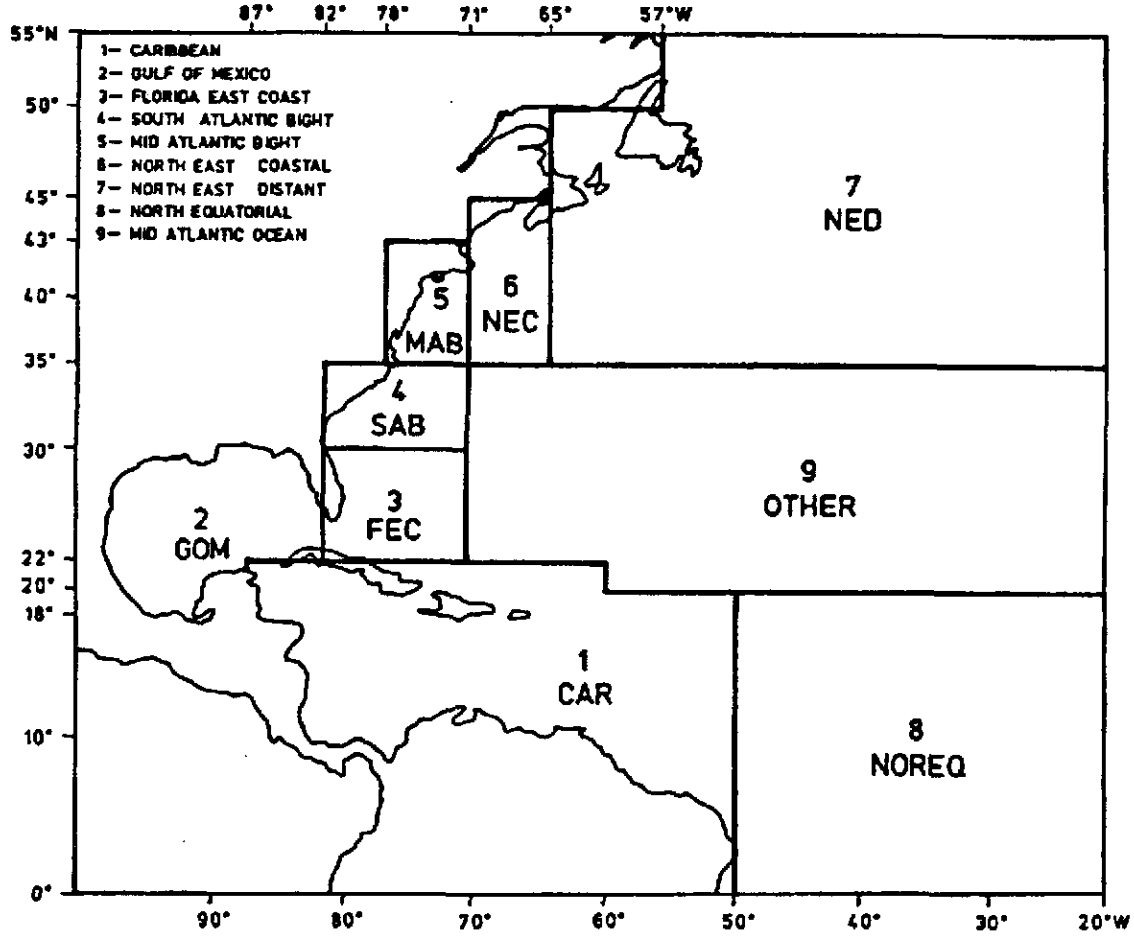


Figure 1 The fishing area definitions used to classify the U.S. pelagic longline effort.

the length measurements needed: a final weight is recorded at the time the carcass is unloaded at the dock. The weight recorded during the offloading of the catch is matched to the length measurements on the data sheets by the attachment of a specially numbered tag to the carcass of the fish of primary interest.

DATA SUMMARY

Vessel Coverage

From May of 1992 through December of 1993 (7 calendar quarters), scientific observers associated with PLOP and LSU observed fishing trips on a total of 106 vessels (31 in 1992 and 75 in 1993). Some of these vessels were observed more than once over this time, although not more than once during any given calendar quarter. So far, our observers have spent 1,269 days at-sea in which 719 sets were observed (Figures 2 and 3). In general, observed vessels fishing in the Gulf of Mexico spent 40-50% of their days-at-sea setting longline gear, while observed vessels in areas along the southeast Atlantic Coast and the Caribbean spent 60-80% of their days at-sea setting gear. Non-fishing time involves transit of the vessel to fishing grounds or time spent seeking live baitfish. The use of live-bait is a common fishing method that has so far, only been observed aboard vessels fishing in the Gulf of Mexico.

In 1992, the shortest average length of mainline set on an observed trip for all areas fished was 8.9 nautical miles (NM) while the longest average set during a trip was 34.9 NM. In 1993, the range of average mainline length for the trips observed was slightly different, from 6.3 to 40.0 NM. During the second through fourth quarters of 1992, a total of 80,426 hooks were set by the vessels observed while 356,353 hooks were observed for 1993. Because the program started part-way into 1992, there are differences in the numbers of trips and sets observed (Figure 4) between 1992 and 1993. The start-up of the program involved hiring and training observer personnel and then as soon as all personnel were available, we were interrupted by Hurricane Andrew in September, 1992. In any event, the fourth quarter of 1992 (our third quarter of operation) marked the first time the 5% sampling target was achieved. We have continued to meet this mark in all quarters since then, because observers were on staff and trained, as well as improved cooperation from the vessel owners and operators.

Species Observed

The presence of a scientific observer onboard a commercial fishing vessel provides an opportunity for collecting valuable information necessary for monitoring both the fishery and the stocks of fish being caught. The data forms, as previously mentioned, provides scientists with basic information to determine 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 and their size, sex and condition. During the period described, PLOP and LSU observer personnel observed a total of 21,333 fish, marine mammals, and sea turtles identified to species level (Tables 1 - 4). Fish released or lost at the ocean surface that could not be identified by the observer to the species

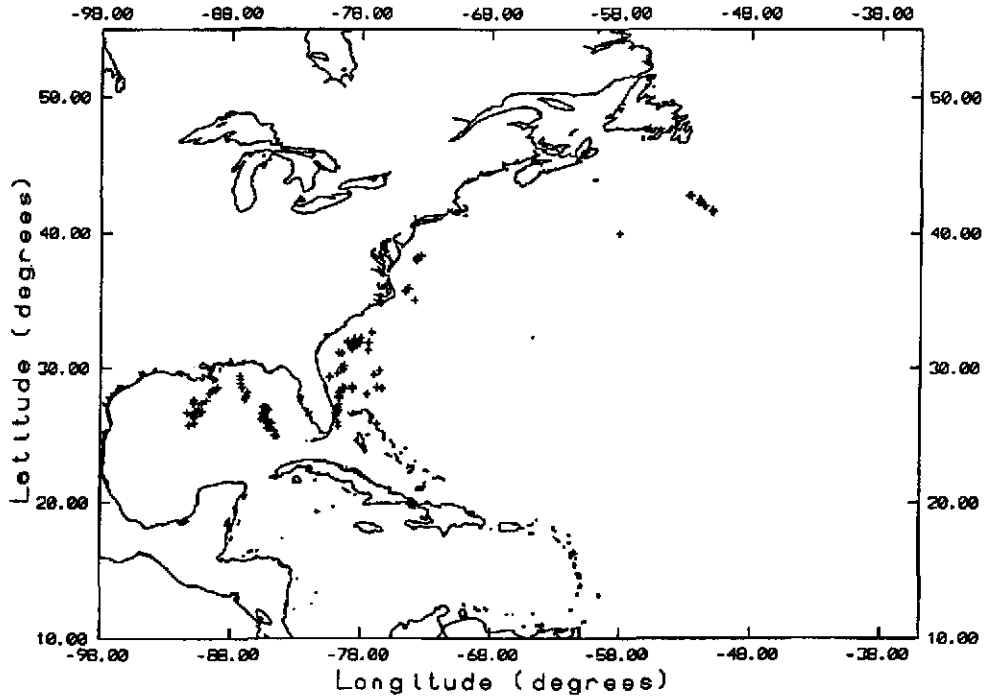


Figure 2 Location of sets from 31 pelagic longline trips observed during 1992.

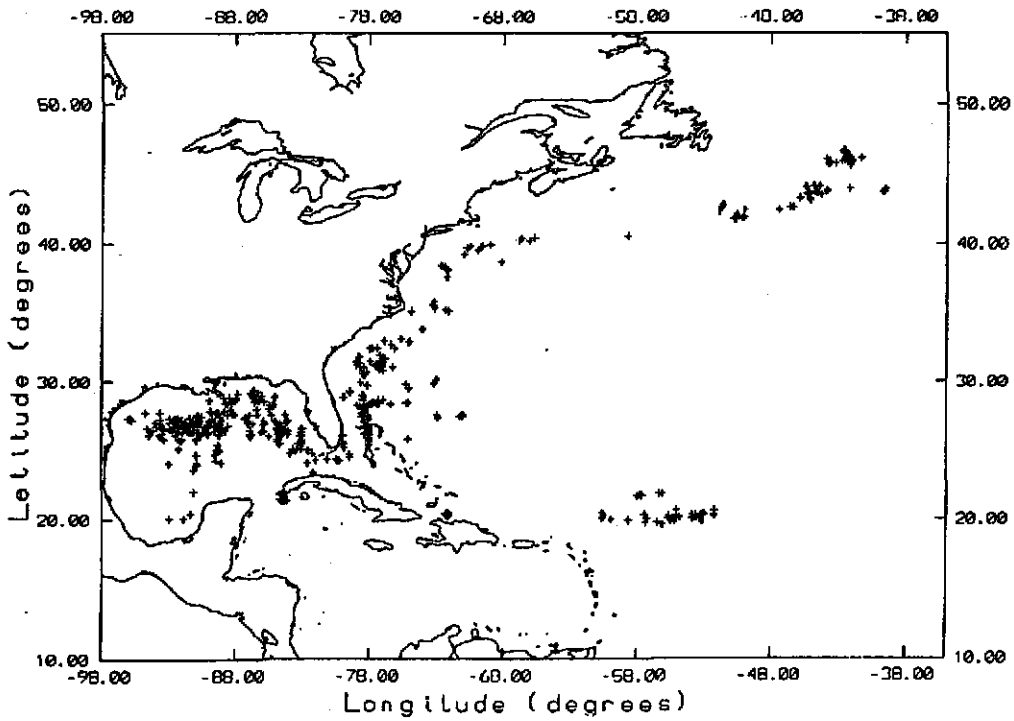


Figure 3 Location of sets from 75 pelagic longline trips observed during 1993.

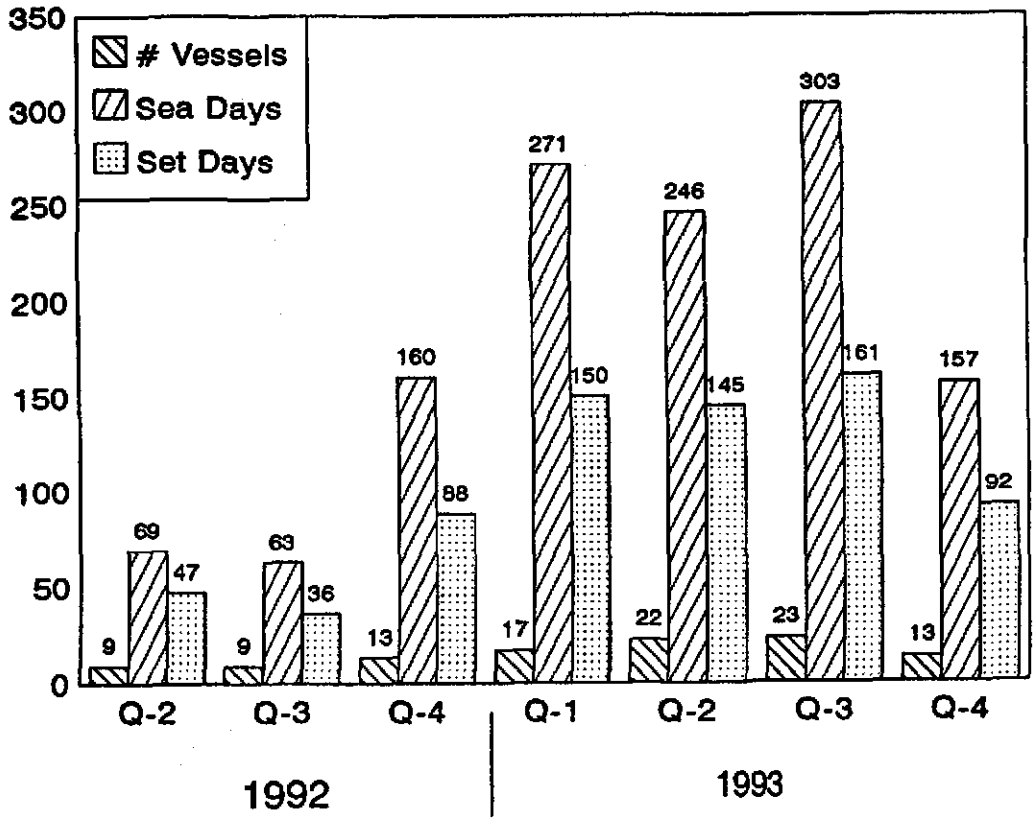


Figure 4 Number of vessel trips observed, days spent at-sea by observers, and number of days sets were observed for each quarter of 1992 and 1993.

level (Tables 2 and 4; Figure 5) were marked as an "UNKNOWN" group category (ie. unknown tuna, unknown shark, etc).

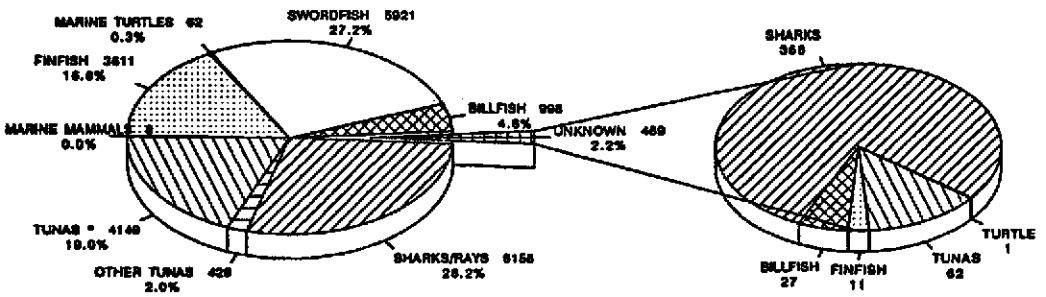
Although a wide variety of fish are caught by the longline vessels observed, only about six species were routinely valued as a marketable product. These primary species, which comprised around 55% of the total observed catch, are swordfish, yellowfin tuna, bigeye tuna, bluefin tuna, dolphin (mahi mahi), and shortfin mako. Of the total fish observed (Figure 5), swordfish made up 27% of the catch while yellowfin, bigeye,and bluefin tunas, in combination, made up 19%. Sharks, a significant by-catch, made up the other large portion of the catch, about 28%.

Observations of the status (alive/dead) of the fish caught and brought along side the vessel is one of the important components needed for assessment of effectiveness of some fishery management tools, like minimum sizes. The observer records the status of the fish at the time the fish is brought alongside the vessel, whether it is kept by the boat or thrown back (Tables 1 - 4; Figure 6). From these data, mortality of those species interacting with the fishery, but not necessarily landed, can be estimated. As an example, the proportion (percent) of swordfish observed brought to the side of the vessel which was dead (Tables 1 and 3) is 82% which is slightly different from the observed proportion of swordfish thrown back dead (78%) indicated in Table 5. The latter of the values expressed above is more meaningful in better 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 species reported in articles by Blue Water Fisherman's Association[1] or NMFS[2].

RESEARCH STUDIES UNDERWAY

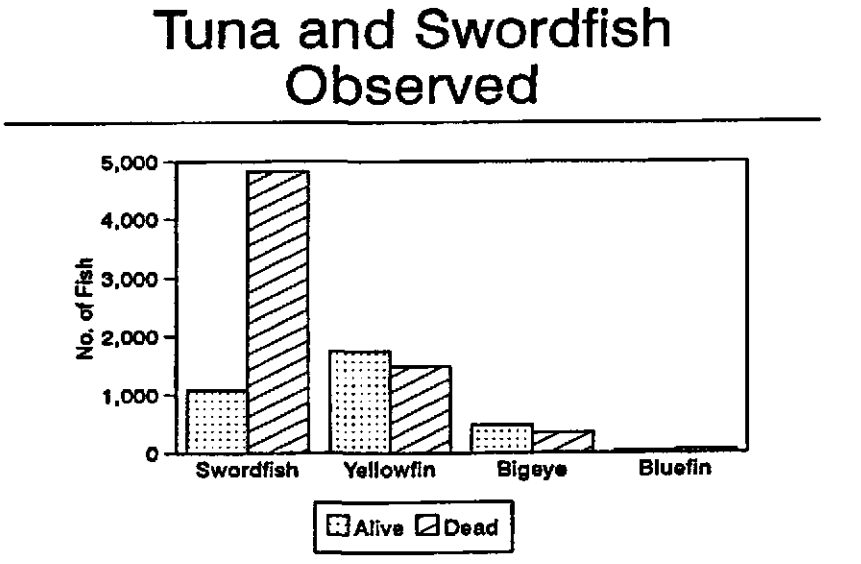
Swordfish Reproduction

Because of a need for more information on the spawning potential for Atlantic swordfish, a reproductive study was initiated in 1990 by programs directed by the NMFS Miami Laboratory and the Fondo Nacional de Investigaciones Agropecuaries (FONAIAP, Venezuela). In several studies over the years, biologists have attempted to estimate female swordfish fecundity (number of eggs produced) and define maturity stages, but the data have either been from too small a number of fish or from a very restricted geographical area to be convincing. From April 1990 through March 1993, 6,137 paired swordfish gonads and size measurements were collected through the cooperative efforts of captains and crews of the Blue Water Fisherman's Association, FONAIAP, contracted observers and NMFS observers. With these data and biological samples available, the Miami Laboratory is re-evaluating prior scientific understanding of sexual maturity in swordfish by analyzing gonadal index values from these gonads (the gonadal index is calculated from ovary weight and carcass weight of female swordfish). We also are examining sex ratios for various geographical areas. Because male and female swordfish appear to grow to different maximum sizes, the number of large fish in the catch which are females is generally greater than the number of large fish in the catch that are males. Sex ratio-at-size information is needed to more accurately estimate the age of the fish caught and provide the means to more precisely assess stock



* Yellowfin
Bigeye
Bluefin

Figure 5 Breadkown (number and percent) of the 21,333 fish, mammals and turtles cought and identified to species by scientific observers. Unidentified fish groups lost at the surface are considered as UNKNOWN.



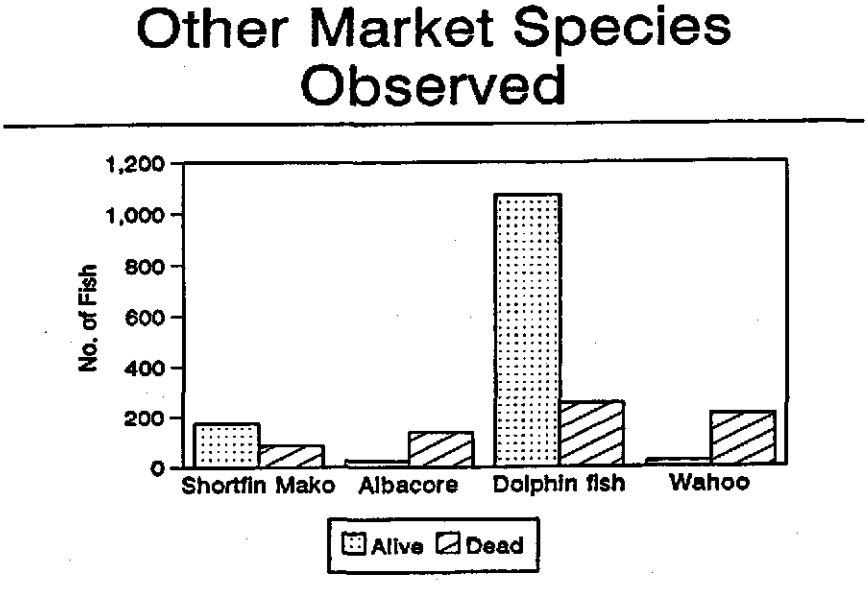


Figure 6 Number of fish recorded for all geographical areas as alive and dead of eight market valuable fish categories caught by longline gear during 1992 and 1993.

status. Sex ratio information has been obtained from 4,038 female (65-275 cm lower jaw fork length (LJFL)) and 2,099 males (65-278 cm LJFL). The geographical region from which these samples were obtained extends from George's Bank to the Caribbean and the Gulf of Mexico. In addition, estimates of fecundity based on the presence of hydrated (ready to spawn) ova have been made for the female swordfish and we have documented several likely spawning areas within the geographical range of the fishery.

Age and Growth Studies

In an effort to determine the age, longevity, and growth rate of swordfish, these same cooperative groups and agencies have also been collecting swordfish anal finrays and otoliths (tiny calcified structures found in the head of fish) which can be used to determine the age of swordfish. From 1990 to March 1993, anal finrays were collected from 2,258 female and 1,258 male swordfish, ranging in overall size of 65 to 285 cm LJFL. Finray samples are available for each month of the year and were collected within the same geographical areas as the gonadal material mentioned above. Currently, the 2nd anal finray is being separated from the overall finray system, cleaned of tissue, and cross sectioned. The cross sections will be examined and analyzed for age determination which is accomplished by counting the growth zonations in the finray cross section much like counting tree rings. Analysis of the growth zonations to see if they are being laid down as an annular event is also underway. Collection of swordfish heads by observers for otolith removal has been less routine because of the variability between boats in processing swordfish (otoliths are located close to where many fishermen cut off the fish head and are sometimes lost or damaged during this process) and the difficulty in locating otoliths in the heads. However, over 500 otolith pairs have been collected from specimens ranging in size from 6.5-258 cm LJFL. Scientists at LSU are examining otoliths from these samples for age analysis based on daily growth zone counts (a much finer grouping of rings than those found in the spine).

Stock Identification

Since half way through 1992, collection of blood and tissues (small portions of the meat, liver, heart, and gonad) for stock identification has been actively pursued for swordfish, yellowfin tuna, bigeye tuna, and bluefin tuna. Biologists at our Charleston NMFS Laboratory and scientists at several other university facilities are examining new techniques of detecting genetic variability at the nucleic acid (DNA) level. The application of these techniques will help determine how similar or different fish are between widely separated geographical areas and if the differences are important in assessment and management of stocks. Initial tests are being conducted using swordfish, yellowfin, and bluefin tuna samples because scientists are unclear which genetic marker (DNA protein) will be the most informative. Once the technique is refined and the proteins identified, more intensive sampling procedures will be initiated during observer coverage aboard vessels, possibly in 1994.

ACKNOWLEDGEMENT

The PLOP observer program is grateful to the vessel owners, operators, and crews that have participated in the observer coverage. Without their overall cooperation, the collection of catch and effort data and biological samples would have been more difficult. Special acknowledgement is given to all SEFSC port agents, NEFSC personnel, Manomet Bird Observatory observer personnel, and the captains, crews, and individuals associated with the Blue Water Fishermen's Association in providing assistance to the program research activities.

FOOTNOTES

1 John J. Hoey, 1992. Bycatch in U.S. Atlantic Longline Fisheries for Swordfish and Tuna. Blue Water Fisherman's Association Newsletter, March 16, 1992. 7p.

2 Mark I. Farber and Dennis W. Lee, 1991. A Statistical Procedure for Estimating the Mortality on Discarded Billfish caught by Longline Gear. International Commission for the Conservation of Atlantic Tunas, Collective Volume of Scientific Papers, 35:113-119.

For more information

For information about the observer program or for scheduling an observer trip, please contact the PLOP Coordinator, Dennis Lee:

(Office) 800 858-0624 (FAX) 305 361-4515

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) 361-5761. The following contact persons are provided:

DEALER REPORTING: John Poffenberger or Andy Bertolino
PELAGIC LOGBOOK REPORTING: Ernie Snell or Herb Prytherch
GAMEFISH TAGGING PROGRAM: Dr. Eric Prince - 800 473-3936

Information on fishing permits or regulation should be directed to the NMFS Southeast Regional Office, St. Petersberg, FL:

REGULATIONS AND PERMITS BRANCH: (813) 893-3722
FISHERIES OPERATIONS BRANCH: (813) 893-3161

Address: Southeast Regional Office
9450 Koger Blvd.
St. Petersburg, FL 33702

TABLE 1: Species of swordfish, tunas, and sharks recorded as alive, dead, and damaged (shark bitten) by observer personnel while deployed aboard U.S. pelagic longline vessels during 1992.

FISH GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
SWORDFISH	Swordfish	208	922	65
TUNAS	Bigeye	217	140	12
	Bluefin	16	15	0
	Yellowfin	454	311	46
BILLFISH	Atlantic Sailfish	35	43	1
	Blue Marlin	39	13	0
	White Marlin	26	14	1
	Longnose Spearfish	3	3	0
SHARKS				
Small Coastal	Atlantic Sharpnose	0	21	3
Large Coastal	Bignose	2	2	0
	Blacktip	4	50	1
	Bull	2	2	0
	Dusky	58	25	0
	Hammerhead spp	1	6	1
	Hammerhead Great	1	5	0
	Hammerhead Scalloped	19	74	4
	Hammerhead Smooth	0	1	0
	Night	1	0	0
	Nurse	7	0	0
	Reef	4	2	0
	Sandbar	75	6	0
	Silky	48	115	0
	Spinner	7	3	0
	Tiger	37	2	0
Pelagic	Blue	191	26	1
	Mako Longfin	3	3	0
	Mako Shortfin	28	9	0
	Thresher Bigeye	10	6	0
	Oceanic Whitetip	17	4	0
OTHERS	Skates/rays	116	1	0

TABLE 2: Species of tunas, finfish, marine mammals, marine turtles, and unknown species groups recorded as alive, dead, or damaged (shark bitten) by observer personnel while deployed aboard U.S. commercial longline vessels during 1992.

SPECIES GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
OTHER TUNA	Blackfin Tuna	4	14	0
	Bonito	1	11	1
	Little Tunny	3	10	2
	Albacore	1	8	0
	Skipjack	3	53	0
FINFISH	Cobia	2	0	0
	Dolphin Fish	382	52	3
	King Mackeral	0	1	0
	Wahoo	9	41	3
	Amberjack	1	0	0
	Barracuda	7	1	0
	Bigeye Cigarfish	1	1	0
	Escolar	59	153	10
	Lancetfish	12	145	31
	Snake Mackeral	3	7	1
	Oilfish	15	7	0
	Opah	0	1	0
	Pomfret	6	5	1
	Sunfish	5	0	0
MARINE MAMMAL	Grampus/dolphin	2	0	0
	Whale	2	0	0
MARINE TURTLE	Leatherback Turtle	4	1	0
	Loggerhead Turtle	2	0	0
UNKNOWN	Unknown Tuna	0	2	7
	Unknown Finfish	1	1	0
	Unknown Billfish	7	3	1
	Unknown Sharks	31	16	0
	Unknown Turtle	0	0	0

TABLE 3: Species of swordfish, tunas, and sharks recorded as alive, dead, and damaged (shark bitten) by observer personnel while deployed aboard U.S. pelagic longline vessels during 1993.

FISH GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
SWORDFISH	Swordfish	877	3628	221
TUNAS	Bigeye	261	182	13
	Bluefin	16	41	2
	Yellowfin	1290	963	170
BILLFISH	Atlantic Sailfish	120	220	28
	Blue Marlin	117	53	12
	White Marlin	106	120	6
	Spearfish Longnose	15	22	1
SHARKS				
Small Coastal	Atlantic Sharpnose	210	46	0
Large Coastal	Blacktip	52	19	1
	Bull	3	2	0
	Dusky	67	21	0
	Hammerhead ssp	6	0	0
	Hammerhead Great	3	5	0
	Hammerhead Scalloped	39	39	2
	Hammerhead Smooth	1	1	0
	Night	1	1	0
	Sand Tiger	3	1	0
	Sandbar	26	6	0
	Silky	174	273	9
	Spinner	9	2	0
	Tiger	57	2	0
Pelagic	Blue	2340	800	3
	Mako ssp	1	0	0
	Mako Longfin	6	6	0
	Mako Shortfin	146	72	3
	Porbeagle	0	1	0
	Thresher ssp	0	1	0
	Thresher Bigeye	23	32	0
	Thresher Common	7	2	0
	Oceanic Whitetip	35	19	0
OTHERS	Skates/rays	571	1	1
	Smooth Dog	3	0	0

TABLE 4: Species of tunas, finfish, marine mammals, marine turtles, and unknown species groups recorded as alive, dead, or damaged (shark bitten) by observer personnel while deployed aboard U.S. commercial longline vessels during 1993.

SPECIES GROUP	COMMON NAME	ALIVE	DEAD	DAMAGED
OTHER TUNA	Blackfin Tuna	19	60	4
	Bonito	3	16	0
	Little Tunny	1	10	0
	Albacore	22	127	2
	Skipjack	0	47	4
FINFISH	Cobia	2	0	0
	Dolphin Fish	690	193	8
	Wahoo	14	156	9
	Amberjack	1	0	0
	Barracuda	28	4	1
	Bigeye Cigarfish	5	7	0
	Escolar	236	266	13
	Grouper	1	1	0
	Lancetfish	206	427	110
	Snake Mackeral	4	11	0
	Oilfish	52	32	6
	Opah	1	2	0
	Pomfret	24	27	0
	Red Snapper	13	0	0
	Sunfish	27	0	0
	Eel	53	0	0
	Puffer	13	2	0
	Squid	1	0	0
MARINE MAMMAL	Grampus/dolphin	2	1	0
	Whale	1	0	0
MARINE TURTLE	Green Turtle	2	0	0
	Leatherback Turtle	36	0	0
	Loggerhead Turtle	16	1	0
UNKNOWN	Unknown Tuna	3	4	46
	Unknown Finfish	9	0	0
	Unknown Billfish	6	7	3
	Unknown Sharks	268	52	1
	Unknown Turtle	1	0	0

TABLE 5: Summary of 6 species of fish recorded by observer personnel as being discarded (ALIVE or DEAD[1]) while deployed aboard U.S. commercial longline vessels from May 1992 to December 1993. Swordfish and billfish were discarded because of Fishery Management Plan prohibitions or damage to the fish. Tunas were discarded because of small size or damage.

COMMON NAME	DISCARDED		PROPORTION DEAD
	ALIVE (A)	DEAD (D)	$\frac{D}{D + A}$
Swordfish	530	1,909	0.783
Bigeye Tuna	56	89	0.614
Yellowfin Tuna	149	272	0.646
Blue Marlin	156	78	0.333
White Marlin	132	141	0.517
Sailfish	155	292	0.653

1) DEAD = Dead + Damaged fish

APPENDIX 1

(A) Longline Gear Characteristic Log form.

SEFC PELAGIC LONGLINE OBSERVER PROGRAM
Long Line/Line Trawl Gear Characteristics Log

01/04/93

Obsvr/Trip ID	Vessel Name	Vessel Number	Date Landed (m/d/y)
			___/___/___

String/Tub No. ____, ____, ____, ____

MAIN LINE

Main Line Stored: Unknown 0 ___; On Reel 1 ___; In Tube 2 ___; Piled on deck 3 ___; Autoline 4 ___; Other 9 ___

# of Strands ____ Diameter ___.__ mm Test ____ lb

Material: Unknown 0; Nylon 1; Polyester 2; Polyethal 3; Polyprop 4; Polyvinyl 5; Cotton 6; Wire 7; Other 9

Color: Unknown 0; Clear 1; White 2; Pink 3; Black 4; Multi 5; Wire 6; Other 9

GANGION

Gangion Length: Minimum ____ ft; Maximum ____ ft; Average ____ ft

Dist. Bet. Gangions: Minimum ____ ft; Maximum ____ ft; Average ____ ft

# of Strands ____

Gangion Diameter ___.__ mm; Test ____ lb

Material: Unknown 0; Nylon 1; Polyester 2; Polyethal 3; Polyprop 4; Polyvinyl 5; Cotton 6; Other 9

Color: Unknown 0; Clear 1; White 2; Pink 3; Black 4; Multi 5; Other 9

Attachment Type: Unknown 0; Clip On 1; Tie On 2; Free Moving 3; Other 9

Swivels Used? No 0; Yes 1

No per Gangion ____

BAITING METHOD

Unknown 0; Hand 1; Grab Baiter 2; Autobaiter 3; Other 9

FLOATS

Used: No 0; Yes 1 ___

Material: Unknown 0; PVC 1; Cork 2; Floating Rope 3; Polyball 4; Styrofoam 5; Polyball/Foam 6; Bullet 7; Other 9

Count: ___ Float Diameter: ____ in ____ in

Drop Line Len: Minimum ____ ft; Maximum ____ ft; Average ____ ft

Dist Bt. Floats: Minimum ____ ft; Maximum ____ ft; Average ____ ft

Max Number of Hooks Between Floats ____

Highfliers: ______ Spacing: ______ nm

Radar Beacons: ______ Spacing: ______ nm

LEADER

Used: No 0; Yes 1

Material: Unknown 0; Steel Wire 1; Mono 2; Other 9

Length: ____ in; # of Strands: ____; Diameter: ___.__ mm; Test: ____ lb

HOOKS

Gap, Min. ____ mm; Throat, Max. ____ mm

Brand ____________ ( )

Model/Pattern Number ________ Size ___/___

LIGHT STICKS

Type: Unknown 0; Shallow Water 1; Deep Water 2; Other 9

Color: Unknown 0; Green 1; White 2; Red 3; Blue 4; Multi-colored 5; Other 9

Comments:

(B) Longline Haul Log form.

NOAA FISHERIES - SEA SAMPLING PROGRAM
Long Line/Line Trawl Haul Log

01/04/93

Observer/Trip ID	Vessel Name	Vessel Number	Date Landed (m/d/y) ___/___/___	Page 1 of ___ for haul

Haul Number	Gear Code 041	Haul Observed? No 0 Yes 1 ___	Weather Code	WIND Spd ___ kn Dir ___ °	WAVE Hgt ___ ft	SWELL Hgt ___ ft Dir ___ °

Soak Duration ___.___ Hrs	Bottom Depth Range ___ - ___ fm	Gear Cond Code	Incidental Take? No 0 Yes 1 ___	Beginning of Haul: Date (m/d/y) ___/___/___ Time (24 hrs) ___:___

LORAN or Lat/Lon	BEGIN SET	Bearing 1 (Lat)	Bearing 2 (Lon)
	BEGIN HAUL	Bearing 1 (Lat)	Bearing 2 (Lon)

	Water Temp	Duration
Set:	° F	. hrs
Haul:	° F	. hrs

Main Line Length ___.___ nm

HOOKS: No Set; No Hauled; No Lost

Hook Depth Range ___ - ___ fm

Line Thrower Used? No 0; Yes 1 ___ Speed ___.___ kn

Vessel Setting Speed ___.___ kn

Item Used? No=0 Yes=1 / Count: Floats; Light Sticks; Rattlers; Surface Lights; Radio Beacons; Radar Reflect; Add Line Wts; Total Weight of Additional Weights ____ Lbs

Bait Used: No 0 ___ Yes 1 ___

	Lbs Used	Kind	Type	Cond.	Avg. Wt.
Bait #1					Lbs
Bait #2					Lbs
Bait #3					Lbs

String or Tub Number Used: 1

WORK AREA ONLY		DATE MON / DAY / YR	TIME (24hr)	LORAN or Lat/Lon Bearing 1 (Lat)	Bearing 2 (Lon)	WATER TEMP °F	Comments
SET	BEGIN	/ /	:			.	
SET	END	/ /	:			.	
HAUL	BEGIN	/ /	:			.	
HAUL	END	/ /	:			.	

NOTE: For . . . targeting large pelagic species, an individual . . . log must accompany this haul log.

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 (mm/dd) ___/___/___	Haul Number	Page ___ of ___

CARCASS Tag Number	SPECIES		No. Photos Taken	STATUS Unknown (0) Alive (1) Dead (2) Damage (3)	Kept (1) Released (2 or 3) Pinned (4) Lost (5) Tended (6)	LENGTH MEASUREMENTS (cm)				Actual Weight (Lbs)	SEX U (0) M (1) F (2)	TAG INFORMATION Number	TR (1) TT (2) RC (3)	Hm Wgt (lbs)
	Name (Abbr.)	Code				Standard		Alternate						
						01	02	Length	Code					