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U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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SUMMARY

The National Marine Fisheries Service (NMFS) has the responsibility for U.S. fishery statistics, research and management of Atlantic tunas and other large oceanic species in support of the ICCAT Convention. The activities related to these responsibilities in 1999-2000 are described in this report.

1. INTRODUCTION

Total (preliminary) reported U.S. catch of tuna and tuna-like fishes (including swordfish, but excluding other billfishes) in 1999 was 28,020 MT. This represents an increase of about 8% (2169 MT) from 1998. Estimated swordfish catch (including estimated dead discards) decreased 70 MT to 3,585 MT, and provisional landings from the U.S. fishery for yellowfin in the Gulf of Mexico increased in 1999 to 2,899 from 2,006 in 1998. The estimated 1999 Gulf of Mexico landings were about 38% of the estimated total U.S. yellowfin landings in 1999. U.S. vessels fishing in the northwest Atlantic landed an estimated 1,214 MT of bluefin, a decrease of 20 MT compared to 1998. Provisional skipjack landings increased by 47 MT to 152 MT from 1998 to 1999, estimated bigeye landings increased by 334 MT compared to 1998 to an estimated 1262 MT in 1999, and estimated albacore landings decreased from 1998 to 1999 by 513 MT to 317 MT.

In addition to monitoring landings and size of swordfish, bluefin tuna, yellowfin tuna, billfish, and other large pelagic species through continued port and tournament sampling, logbook and dealer reporting procedures, and scientific observer sampling of the U.S. fleet, major research activities in 1999 and 2000 focused on several items. Research on development of methodologies to determine the genetic discreetness of large pelagic fishes in the Atlantic was continued. Larval surveys for bluefin tuna and other large pelagics in the Gulf of Mexico were continued. Research continued on development of robust estimation techniques for population analyses. Research was also continued on approaches for characterization of uncertainty in assessments and methods for translating that uncertainty into risk levels associated with alternative management approaches. U.S. scientists also continued to coordinate efforts for the ICCAT Enhanced Research Program for Billfish and for the Bluefin Year Program. Cooperators in the Southeast Fisheries Science Center's Cooperative Tagging Center tagged and released 2,555 billfishes (swordfish, marlins and sailfish) and 940 tunas in 1999. This represents a decrease of 2% from 1998 levels for billfish, and a 62% decrease for tunas. Cooperative research was conducted with scientists from other nations on development of assessment methodologies, on biological investigations and on development of indices of abundance for species of concern to ICCAT.

2. FISHERIES MONITORING

2.1 Tropical Tunas

A thorough review of available commercial and recreational landings databases for the tropical tunas yellowfin, bigeye and skipjack (as well as for the temperate albacore tuna) was conducted for the years 1980-1998. This review, the methodologies and results of which were reported in SCRS/99/58, has resulted in revisions to the historical landings estimates for these species. These revisions have been reported separately to ICCAT and are reflected in the tables which follow. Revisions to purse seine landings estimates, however, will be reported to ICCAT at a later date; these estimates are still undergoing review, with particular attention to the assignment of fishing areas.

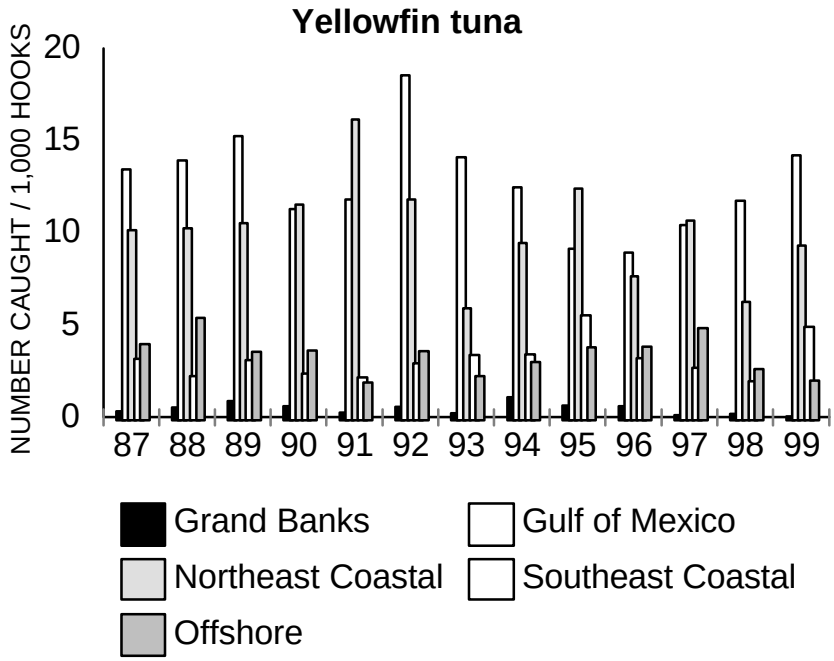
Yellowfin Tuna. Yellowfin is the principal species of tropical tuna landed by U.S. fisheries in the western North Atlantic. Total estimated landings increased to 7,569 MT in 1999, from the 1998 landings estimate of 5,619 MT (Table 2.1-YFT). The 1999 estimate is considered provisional and may change owing to incorporation of late reports of commercial catches as they become available and to possible revisions in estimates of rod & reel catches made by recreational anglers. A high proportion of the landings were due to estimated rod & reel catches of recreational anglers in the NW Atlantic (3,818 MT). Estimates of U.S. recreational harvests for tuna and tuna-like species continue to be reviewed and this may result in the need to

report additional revisions to the available estimates in the future. In 1996, 28%; in 1997, 34%; in 1998, 36%; and in 1999, 39%; of the estimated U.S. yellowfin landings resulted from fish caught in the Gulf of Mexico; whereas between 1991 and 1993 longline catches from the Gulf of Mexico represented 47-64% of the estimated U.S. total. Nominal catch rate information from logbook reports (longline catch per 1000 hooks) for yellowfin by general fishing areas is shown in Figure 2.1-YFT.

Table 2.1-YFT. Annual Landings (MT) of Yellowfin Tuna from 1996 to 1999

Area	Gear	1996	1997	1998	1999
NW Atlantic	Longline	728.3	838.9	464.9	581.3
	Rod and reel*	4484.8	3560.9	2845.7	3818.2
	Troll	371.0	218	177.5	0
	Purse seine	6.8	0	0	0
	Gillnet	13.2	1.3	1.7	0.2
	Pairtrawl	0	0	0	0
	Trawl	7.3	1.9	0.7	4.1
	Harpoon	0	0	0	0
	Handline	37.2	34.3	0	192
	Trap	0	**	0.1	0.8
	Haul Seine	0	0	0	0
	Uncl	0.4	0	0	2.1
Gulf of Mexico	Longline	2164.8	2571.3	1864.5	2736.6
	Rod and reel*	13.2	7.7	80.9	149.4
	Handline	47.0	55.6	60.8	12.7
	Gillnet	0	0	0	**
	Uncl	19.6	0	0	0
Caribbean	Longline	34.2	135.4	58.6	24.4
	Troll	0	19.6	0	0
	Handline	0	.7	3.9	14.5
	Gillnet	0	**	0	0
	Trap	0	.1	0	0.1
NC Area 94a	Longline	319.3	6.1	4.6	0.2
SW Atlantic	Longline	38.4	221.9	55.3	32.4
All Gears		8285.5	7673.7	5619.2	7569

** $\leq$ 0.05 MT* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.



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Skipjack Tuna. Skipjack tuna also are caught by U.S. vessels in the western North Atlantic. Total reported skipjack landings (preliminary) increased from 105 MT in 1998 to 152 MT in 1999 (Table 2.1-SKJ). Most of the catch is taken off the U.S. east coast (NW Atlantic) between Cape Hatteras and Long Island. Estimates of recreational harvests of skipjack continue to be reviewed and could be revised again in the future. Figure 2.1-SKJ presents nominal catch rate information (longline catch per 1,000 hooks) based on fishing logbook reports.

Table 2.1-SKJ. Landings (MT) of Skipjack Tuna from 1996 to 1999

Area	Gear	1996	1997	1998	1999
NW Atlantic	Longline	.1	1.0	0.7	0.3
	Rod and reel*	48.1	42.0	49.5	63.6
	Troll	.9	.6	0.4	0
	Purse seine	.7	0	0	0
	Gillnet	18.5	8.9	16.9	26.5
	Trawl	0	0	0.2	1.0
	Handline	0.3	.1	0	0.2
	Trap	15.2	0	0	17.5
	Pound	0	0	0	0
	uncl	**	0	0	0
Gulf of Mexico	Longline	.2	1.3	0.6	0.4

	Rod and reel*	36.4	21.7	37.0	34.8
	Handline	0.1	0	0	0.4
	Trap	0	0	0	0
Caribbean	Longline	0	1.2	0	1.3
	Gillnet	0	.2	0	0.4
	Harpoon	0	0	0	0
	Handline	0	0	0	5.8
	Trap	0	**	0	0.1
	Trol	**	7.3	0	0
	uncl	0	0	0	0
SW Atlantic	Longline	0	**	0	0
All Gears		120.5	84.3	105.3	152.3

** <= 0.05 MT
* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.

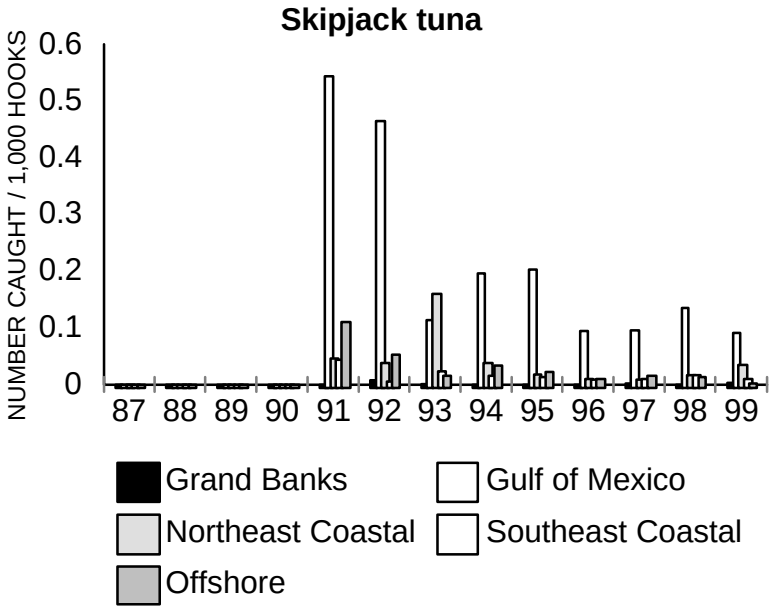


Figure 2.1-SKJ. *Nominal catch rates for SKJ in US Longline logbook reports.*

Bigeye Tuna. The other large tropical tuna reported in catches by U.S. vessels in the western North

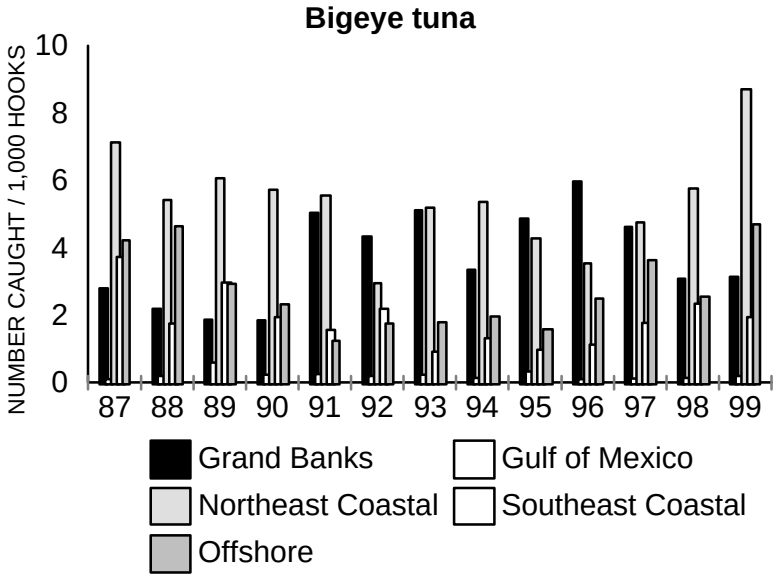
Atlantic is bigeye tuna. The majority of U.S. landings of this species comes from longline vessels fishing off the east coast of the U.S. in the area from Cape Hatteras, North Carolina to Massachusetts. These landings accounted for 57% of the U.S. bigeye catch in 1999. Total reported catches and landings (preliminary) for 1999 increased by 36% from 928 MT in 1998 to 1262 MT. Note that like yellowfin, the estimates of rod & reel catch are considered provisional and may be revised based on results of a future review of recreational harvest estimates. Figure 2.1-BET presents nominal catch rate information (longline catch per 1,000 hooks) based on fishing logbook reports.

Table 2.1-BET. Landings (MT) of Bigeye tuna by year for 1996-1999.

Area	Gear	1996	1997	1998	1999
NW Atlantic	Longline	333.0	476.3	544.3	737.8
	Rod and reel*	108.2	333.5	228.0	316.1
	Troll	4.1	3.9	4.0	0
	Gillnet	4.2	**	0.4	0.2
	Handline	16.4	2.7	0	11.9
	Pairtrawl	0	0	0	0
	Trawl	1.4	1.0	0.5	1.2
	Harpoon	0	0	0	0
	Haul Seine	0	0	0	0
	Uncl	0.1	.5	0	0.9
Gulf of Mexico	Longline	30.9	33.9	25.6	54.6
	Rod and reel*	0	0	0	1.8
	Handline	0.9	**	0.1	0.2
Caribbean	Longline	32.8	50.0	48.5	23.2
	Handline	0	0	0	0.2
NC Area 94a	Longline	228.9	91.8	48.4	35.3
SW Atlantic	Longline	34.9	142.8	28.5	78.2
All Gears		795.8	1136.4	928.3	1261.6

** $\leq$ 0.05
* Rod and Reel catches and landings represent estimates of landings and dead discards based on statistical surveys of the U.S. recreational harvesting sector.

***Figure 2.1-BET**. Nominal catch rates for BET in US Longline logbook reports.*



2.2 Temperate Tunas

Bluefin. The U.S. bluefin fishery continues to be regulated by quotas, seasons, gear restrictions, limits on catches per trip, and size limits. To varying degrees, these regulations are designed to restrict total U.S. landings, to preserve the monitoring nature of the fishery, and to conform to ICCAT recommendations.

U.S. vessels fishing in the northwest Atlantic (including the Gulf of Mexico) in 1999 landed an estimated 1,214 MT of bluefin tuna (see Table 2.2-BFT). Those estimated landings represent a decrease of 20 MT from the 1998 landings. The 1999 landings by gear were: 248 MT by purse seine, 116 MT by harpoon, 15 MT by handline, 225 MT by longline (of which 111 MT were from the Gulf of Mexico), 761 MT by rod and reel (of which, 103 MT was the preliminary estimate for bluefin less than 145cm SFL from off the northeastern U.S), and less than 1 MT was taken by other gears.

In response to 1992 regulations limiting the allowable catch of small fish by U.S. fishermen, in comformity with ICCAT agreements, enhanced monitoring of the rod and reel fishery was implemented in 1993 for the purpose of providing near real-time advice on catch levels by this fishery. This monitoring activity has continued and has included estimation of catches by finer size categories than reported above. The preliminary estimates for the 1999 rod and reel fishery off the northeastern U.S. (including the North Carolina winter fishery) for landings in several size categories were 2,841 fish <115 cm (of which 44 fish, less than 0.2 MT, were <66 cm), 1,241 fish 115-144 cm and 345 fish 145-177 cm (an estimated 53, 50, and 33 MT, respectively). Note that additional rod and reel landings of bluefin >177 cm SFL, monitored through a sales reporting system, are included in Table 2.2-BFT.

In 1994, a catch and release fishery for bluefin developed off the coast of North Carolina during the winter months (January-March). Catch rates (primarily of medium and/or large bluefin) were extremely high (often in the 10's of fish per trip) when compared to catch rates off the New England coast (about one fish per nine trips). It is believed that during 1995, 1996, and again in 1997, the level of fishing effort in the North Carolina fishery increased relative to 1994. Landings of fish >177 cm SFL are restricted to one fish per each permitted vessel per year, and the total amount of those landings is restricted to 4 MT. Landings of fish <178 cm SFL are allowed, subject to variable bag limits. Many bluefin tuna have been tagged by cooperative anglers from this fishery. In 1996, a program was instituted to monitor the catch, catch rates, and landings from this fishery. This component of the 1999 rod and reel fishery landings (included in the totals reported above) was estimated to be about 5 MT of fish <145cm, about 8 MT of fish 145-177cm, and about 6 MT of fish >177 cm. During January and February of 1999, the catch rates were somewhat higher than in 1998, but the catches mainly occurred off southern North Carolina.

The magnitude of dead discarded catch is not observed in the same way that landed catch is observed. Because of this, the magnitude of dead discarded catch must be estimated in some fashion. Estimates can vary, depending on the information used for estimation, leading to more uncertainty in these estimates. In previous reports, historical estimates of US longline dead discards (1992-97) were based upon tallies of reported dead discards by the fishermen on logbooks. Use of direct observations of discard rates for estimating dead discarded catch in the U.S. longline fleet has been applied for a range of species, including marine mammals, sea turtles, swordfish, blue marlin, white marlin, sailfish, and other species of interest to ICCAT. For these species, it has been demonstrated that direct observations of dead discard rates are typically higher than self-reported rates from logbooks. This is not an unexpected result since, in general, it is believed to be more difficult for fishers to maintain accurate daily records of the numbers and condition of fish thrown back to the sea than for fish that are kept for sale. It has been a long-standing recommendation of ICCAT's Standing Committee on Research and Statistics to implement scientific observer programs in Atlantic tuna fleets for the purpose of characterizing the total catch and its disposition. In view of these recommendations, ICCAT has recommended implementation of

observer programs on Atlantic tuna fleets to obtain coverage of at least 5%, depending on the fishery. The US has implemented scientific observer sampling in selected fleets and the US ICCAT scientific enterprise has pursued research on methods to address characterizing the total catch composition and disposition from the observed fleet.

As for swordfish, billfishes, sharks and other species of interest to ICCAT, provisional estimates of US longline discards of bluefin tuna based on direct observation of the U.S. pelagic fleet for the period 1992-1999 were completed and reported to the ICCAT west Atlantic Bluefin Species Group at its year 2000 meeting. The method applied provided a basis for characterizing the uncertainty in the estimates, which can be high. Due to sparse sampling in a number of geographical and time strata, the estimation procedure also provided an option for pooling across strata to achieve a minimum of 30 observations per stratum. The pooling order applied was based on an analysis that indicated smaller differences between years than between geographical or quarterly strata. The effect of the pooling assumption was compared and it was observed that in recent years estimates made without pooling were somewhat lower than with pooling, although that is not the case for all years. Comparisons of the point estimates for the most recent year against several the time-period average levels for different treatments of the available logbook and observer data is shown in Table 2.2a-BFT.

Table 2.2a-BFT.

Estimates of BFT Longline Discard Estimates using several different methods				
Methodology	**Mean Annual Metric Tonnes for the Period Indicated**			
	1992-1997[1]	*1993-1997*[1]	*1994-1997*[1]	*1999*[1]
logbook tallies	67	72	82	30
no pooling	171	177	198	83
5 observations for pooling	197	206	233	134
30 observations for pooling	145	131	139	151

Notes: *logbook tallies* represents the methodology previously applied and assumes that logbook reports are an accurate indication of the levels of dead discarded BFT; *no pooling* makes use of the direct observations of dead discard rates, but assumes for strata for which no observations are available, that 0 dead discards occurred even though logbooks might indicate otherwise; *5 observations for pooling* makes use of the direct observations of dead discard rates and pools across years until at least 5 observations per area-quarter stratum is achieved for computing observed dead discard rates; *30 observations for pooling* makes use of the direct observations of dead discard rates and pools across years and for some cases, quarters, until at least 30 observations per area-quarter stratum are achieved.

[1] Calendar year statistics

It was not clear to the year 2000 ICCAT west Atlantic Bluefin Tuna Species Group, which reviewed the document presenting time-series estimates based both on direct observation of the fleet and from logbook reports, that the pooling method resulted in the best estimation for each individual year, but it was noted that the pooling method, when considering the entire time series, provided a consistent time series. The ICCAT west Atlantic Bluefin Tuna Species Group agreed to use the pooling method time-series in the assessment, but recommended that increased numbers of per stratum observations be considered to avoid the need for pooling in the future. The difference between assessment results using the tallies versus those adjusted with observer data are marginal. Indeed, the estimated average recruitment level used for evaluating stock outlook is slightly more *optimistic* when using the observer adjusted data. The ICCAT west Atlantic Bluefin Tuna Species Group recommended "*that further attention needs to be paid to the collection of data on discards and their subsequent estimation so that the effect*

of discarding can be fully included in the stock assessment. The quality of the information is enhanced by Observer Programs. Observer sampling should be sufficient to quantify discarding in all months and areas and to avoid the need for pooling across time or area strata thought to be important to constructing estimates. Studies should be conducted to improve estimation of discards and to identify methods that would reduce discard mortality. Studies should also be conducted to estimate the subsequent mortality of bluefin discarded alive."

As the recovery plan allocation for dead discards was based upon an historical standard which, in turn, was based upon the logbook tally estimates, the corresponding consistent estimator for longline discards in the most recent (1999) calendar year is 30 MT. It is likely that the logbook tallies are less than the actual level of dead discards. However, without additional observational data, it is not possible to more precisely determine the actual level for any given year. It should also be noted that even with relatively high numbers of observations per stratum, the precision of the resulting estimates may not meet the needs of management. Information can be gained by comparison of calendar year 1999 estimates to the historical average *within an estimation method* (Table BFT-2.3). This comparison indicates that the management goal has likely been achieved, *i.e.* that 1999 dead discards are not significantly different than the historical average and perhaps even less.

The United States is committed to seeking a review of the dead discard estimation methodology from an independent scientific panel. This panel would recommend the most appropriate fashion to evaluate the precision and accuracy of methods and assumptions needed to estimate dead discarded catches given current sampling levels for the range of species taken as bycatch and for determining compliance given the terms of the rebuilding program. Our intent is to report the results of this study to ICCAT in 2001.

Table 2.2b-BFT. Landings (MT) of Bluefin tuna for 1996 to 1999.

Area	Gear	1996	1997	1998	1999
NW Atlantic	Longline	31.7	26.0	30.5	25.1
	Handline	32.5	17.4	29.2	15.5
	Purse Seine	245.0	249.7	248.6	247.9
	Harp	95.7	97.5	133.1	115.8
	* Rod and reel (>145 cm LJFL)	588.5	752.6	610.4	657.5
	* Rod and reel (<145 cm LJFL)	251.7	178.9	166.3	103.0
	Uncl	2.8	2.2	0.6	0.1
Gulf of Mexico	Longline	36.2	23.8	18.3	48.4
	* Rod and reel	0.0	0.0	0.0	0.4
	All Gears	1284.1	1348.1	1237	1213.7

* Rod and Reel catches and landings represent estimates of landings and dead discards when available based on statistical surveys of the U.S. recreational harvesting sector.

Albacore. Albacore are landed by U.S. vessels; however, historically, albacore has not been a main focus of the U.S. commercial tuna fisheries operating in the North Atlantic. Commercial reported catches were relatively low prior to 1986; however, these catches increased substantially and have remained at higher levels throughout the 1990s, with nearly all of the production annually coming from the northeastern U.S. coast. Caribbean landings increased in 1995 to make up over 14% of the total, but U.S. landings from the Caribbean have remained below 4% of the total each year during 1996-1999. Nominal catch rate information from U.S.

longline logbook reports are shown in Figure 2.2-ALB. Historically, commercial landings have primarily been made using longline gear. In the early 1990's pair trawls were used to catch albacore, but this gear type is no longer used in U.S. Atlantic waters for albacore. Albacore are frequently sought by recreational fishermen; estimated recreational landings of albacore exceeded commercial landings reports each year during the 1980s, and since 1990 have exceeded commercial landings in 4 of 9 years. Estimated total catches of albacore were 333 MT in 1999, a decrease of 496 MT from 1998 which was primarily due to a decrease in estimated rod and reel catches from 601 MT in 1998 to 90 MT in 1999.

Table 2.2-ALB. Landings (MT) of Albacore tuna for 1996 to 1999.

Area	Gear	1996	1997	1998	1999
NW Atlantic	Longline	63.6	140.0	155.4	179.5
	Gillnet	30.7	42.8	40.1	27.0
	Handline	3.7	4.8	0	0.6
	Trawl	1.7	2.6	2.4	0.4
	Troll	2.7	1.6	5.8	0
	Rod and reel*	277.8	220.2	601.1	90.1
	Pair Trawl	0	0	0	0
	Pound	3.5	1.3	0.9	0.4
	Uncl	21.1	0.2	0	0
Gulf of Mexico	Longline	5.7	16.9	3.9	3.8
	Rod and reel*	61.7	49.3	0	0
	Handline	0.1	0	0	**
Caribbean	Longline	6.6	16.1	17.8	8.3
	Trol	0	3.6	0	0
	Gillnet	0	**	0	0.2
	Trap	0	**	0	**
	Handline	0	0	0	3.8
NC Area 94a	Longline	32.4	11.4	1.6	1.5
SW Atlantic	Longline	1.1	4.7	1.4	1.4
	All Gears	512.4	515.5	830.4	317

** <= 0.05 MT
* Rod and Reel landings are estimates of landings and dead discards, when available.

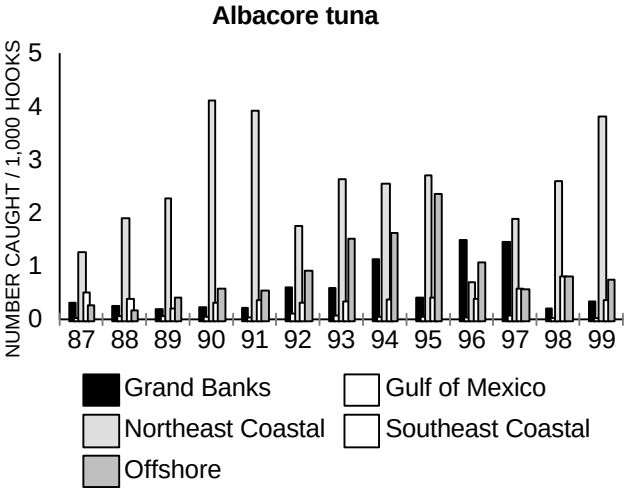


Figure 2.2 ALB*. Nominal catch rates for ALB in US Longline logbook reports.*

2.3 Swordfish

For 1999 the provisional estimate of U.S. vessel landings and dead discards of swordfish was 3,585 MT (Table 2.3-SWO). This estimate is somewhat lower than the estimate of 3,660 MT for 1998. Decline in U.S. landings of swordfish compared to the 1989-90 average of about 5,000 MT per year was at least in part due to the U.S. implementing regulations which set allowable catch levels of Atlantic swordfish by U.S. fishers on a fishing year basis (June-May). The provisional landings, excluding discard estimates, by ICCAT area for 1999 (compared to 1998) were: 539 MT (576 MT) from the Gulf of Mexico (Area 91); 1511 MT (1349MT) from the northwest Atlantic (Area 92); 252 MT (501 MT) from the Caribbean Sea (Area 93); and 605 MT (632 MT) from the North Central Atlantic (Area 94A), and 179 MT (160 MT) from the SW Atlantic (Area 96).

U.S. swordfish landings are monitored in-season from reports submitted by dealers, vessel owners and captains, NMFS port agents, and mandatory daily logbook reports submitted by U.S. vessels permitted to fish for swordfish. This fishery is also being monitored via a scientific observer sampling program, instituted in 1992. Approximately 5% of the longline fleet-wide fishing effort is randomly selected for observation during the fishing year. In 1998, fishing effort for drift gillnets was not sampled due to the closure of this fishery. The observer sampling data, in combination with logbook reported effort levels, support estimates of approximately 36,604 fish discarded dead in 1999, representing an estimated 449 MT of swordfish. This reflects an increase of 57 MT in estimated discarded swordfish from the 1998 level. An increase could be due to recent relatively strong recruitment as estimated in the most recent swordfish stock assessment.

Total weight of swordfish sampled for sizing U.S. landings by longline, otter trawl, trap, and rod & reel and handline was 2,847 MT, 7.5 MT, 0.03 MT and 5.04 MT in 1999. No harpoon or gillnet landings were reported in 1999. The weight of sampled swordfish landings in 1999 were 93%, 100%, 100%, and 10% of the U.S. total reported annual landings of swordfish for longline, otter trawl, trap and rod& reel and handline. Again, incorporation of late reports into the estimated 1999 landings figure will likely result in changes in the sampled fraction of the catch. Recent estimates of rod and reel landings of swordfish based on statistical surveys of recreational anglers, range from about 5-21 MT per year for the period 1996-1999.

Table 2.3-SWO. Catches and Landings (MT) of Swordfish for 1996 to 1999.

Area	Gear	1996	1997	1998	1999
NW Atlantic	* Longline	1310.4	1262.2	1624.1	1872.3
	Gillnet	77.8	.4	36.3	0
	Pair Trawl	0	0	0	0
	Handline	.1	1.3	0	5.0
	Trawl	19.8	8.0	5.9	7.5
	Troll	7.3	0.4	0.7	0
	* unclassified	25.8	11.9	9.1	3.8
	Harpoon	.5	.7	1.5	0
	** Rod and Reel	5.92	10.91	4.71	21.32
	Trap	0	0	0.1	**
Gulf of Mexico	* Longline	896.3	759.9	633.1	579.6
	Handline	0	0	0	**
Caribbean	* Longline	1180.0	688.9	516.0	260.5
NC Atlantic	* Longline	629.4	688.2	658.6	650.0
SW Atlantic	* Longline	172.6	417.9	170.1	185.2
	All Gears	4325.92	3850.71	3660.21	3585.22

* includes landings and estimated discards from scientific observer and logbook sampling programs.
** $\leq$ = 0.5 MT

2.4 Billfishes

Blue marlin, white marlin, and sailfish are landed by U.S recreational rod and reel fishermen and are a by-catch of the U.S. commercial tuna and swordfish longline fisheries. The U.S. Fisheries Management Plan for Atlantic Billfishes was implemented in October, 1988. The Plan allows billfish that are caught by recreational gear (rod and reel) to be landed only if the fish is larger than the minimum size specified for each species covered by the Plan. Recreational landings of each billfish species are estimated using: (a) the SEFSC Recreational Billfish Survey which provides the number of billfish caught during tournaments held along the southeastern U.S. coast (south of 35^0 N latitude), in the Gulf of Mexico, and U.S. Caribbean Sea regions (i.e., U.S. Virgin Islands and Puerto Rico); and (b) the Large Pelagics Recreational Survey conducted by the National Marine Fisheries Service which provides estimates of recreational billfish harvest from waters along the northeastern U.S. (north of 35^o N latitude). Landed recreational catch of these species by non-tournament fishers is not well estimated and for this reason, the landings reported for recreational rod and reel fishers is thought to be conservative. It is not yet known to what degree or for which species, estimates of rod and reel landed catch should be adjusted to account for this feature, although studies are underway which could help to resolve this question.

In addition to restrictions on U.S. recreational harvest, the Management Plan also imposed regulations on commercial fisheries by prohibiting retention and sale of the three species at U.S. ports. For this reason, no U.S. commercial landings were reported for any of the three Atlantic species. However, estimates of by-catch mortality in the U.S. longline fleet are made using the data from mandatory pelagic logbooks and scientific observer data collected on this fleet. The procedure for estimating the historical by-catch of blue marlin, white marlin, and sailfish was detailed in SCRS/96/97-Revised. This procedure was implemented for estimating the 1998 and 1999 by-catch mortalities from the U.S. longline fleet. Revisions to historical landings of billfish previously reported to ICCAT were based on review of the estimates conducted at the 1996 ICCAT Billfish Workshop held in Miami.

The preliminary estimates of 1999 U.S. recreational catches for these billfish species, combining the geographical areas of the Gulf of Mexico (Area 91), the northwestern Atlantic Ocean west of the 60° W longitude (Area 92), and the Caribbean Sea (Area 93) are: 36.9 MT for blue marlin, 1.6 MT for white marlin, and 0.7 MT for sailfish. The estimates for 1998 were 49.2 MT, 2.6 MT, and 1.2 MT, respectively, for the three species. The estimates of the U.S. recreational landings do not include any estimates of mortality of released (or tagged and released) fish. Additionally, these landings include survey estimates of non-tournament billfish mortality and survey estimates from tournaments, but do not constitute a census of all tournaments. Because some components of the charter boat and non-tournament recreational fishery are not surveyed, the recreational catches are considered minimum estimates. Therefore, the rod and reel landings presented in Table 2.4-BIL include a '?' to represent the unknown quantities of recreationally caught billfish not recorded.

Provisional estimates, which make use of observer sampling data in combination with logbook reported effort levels, of billfish by-catch discarded dead in the U.S. commercial longline and other commercial fisheries for 1999 were 82.1 MT for blue marlin, 56.7 MT for white marlin, and 71.6 MT for sailfish. The estimated 1998 U.S. discarded dead bycatch was 52.4 MT, 32.8 MT, and 27.1 MT, respectively for the three species. The catches and landings (MT) by species, area, and gear, for 1997-1999 are presented in Table 2.4-BIL.

Table 2.4-BIL. Landings (MT) and dead discards of Blue Marlin, White Marlin and Sailfish for 1997-1999.

		Blue Marlin			White Marlin			Sailfish		
Area	Gear	1997	1998	1999	1997	1998	1999	1997	1998 1	1999
NW Atlantic	* Longline	18.7	23.3	22.0	11.2	15.3	18.6	9.2	6.4	13.7
	* Unclassified		0.62			0.7	0.06		0.06	
	Rod and reel	25.0 +?	34.1 +?	24.8 +?	0.9 +?	2.4 +?	1.5 +?	0.0 +?	0.1 +?	0.07 +?
Gulf of Mexico	* Longline	51.0	18.5	55.2	15.4	11.8	31.5	13.3	17.0	57.4
	Rod and reel	11.5 +?	4.5 +?	7.5 +?	0.9 +?	0.2 +?	0.1 +?	0.4 +?	1.0 +?	0.6 +?
Caribbean	* Longline	24.6	2.3	1.6	6.6	1.3	5.04	3.3	0.2	0.46
	Rod and reel	8.6 +?	10.6 +?	4.6 +?	0.0 +?	0.02 +?	0.0 +?	0.2 +?	0.05 +?	0.0 +?
	Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unknown & NC Area 94a	* Longline	2.3	6.1	1.6	0.5	2.8	1.08	0.0	0.8	0.02

SW Atlantic	* Longline	41.5	1.6	1.7	37.1	0.9	0.45	31.9	2.7	0.02
	All Gears	183.2	101.6	119.0	72.6	35.4	58.3	58.3	28.3	72.3

* includes landings and estimated discards from scientific observer and logbook sampling programs.

Information from a statistical survey (Marine Recreational Fishery Statistics Survey, MRFSS) of the US recreational harvesting sector conducted over part of the US northeast coast continues to be under evaluation for its application to estimating billfish catches by recreational fishers. Preliminary results were presented at the 2000 SCRS meeting in SCRS/00/52. Although billfish are considered "rare event" species in this survey and accordingly the estimates may suffer from bias and imprecision, they do provide a possible basis for evaluating the potential degree of conservatism in the values reported in Table 2.4 BIL for recreational (rod and reel) harvest. These estimates were predictably higher than the previous RBS estimate due to more complete coverage of the recreational fishery for billfish by the MRFSS. However, due to an abrupt change in the historical size distribution of the MRFSS samples, the expanded estimates for blue marlin remain suspect and could be the result of some statistical , or other anomaly. Thus, revision to the task I series for marlin should not yet be adopted at this time as best estimates for the historical record.

2.5 Mackerels

Significant catches of king and Spanish mackerels by U.S. fishermen have occurred since the 1850's for Spanish mackerel and since the 1880's for king mackerel. The major gears currently exploiting these species are handlines and gillnets. Purse seines were also used to harvest king mackerel during the 1980's. Gillnets have historically been the main commercial gear for Spanish mackerel however in recent years, recreational removals have become an important component in total catches for both species. The majority of king mackerel catches are taken off North Carolina and Florida and it is believed that a major production area off Louisiana, is recovering. The primary Spanish mackerel catch areas include the Chesapeake Bay and Florida. Current fisheries are co-managed under the Coastal Migratory Pelagic Resources FMP enacted in 1983 and regulations adopted by the South Atlantic and Gulf of Mexico Fishery Management council and implememented by NMFS. Annual catches are monitored closely by NMFS and within season management measures include commercial trip limits, seasonal and area quotas, and recreational per person daily bag limits. Because these species occur in both federal and state territorial zones of U.S. successful management has required participation by both federal and state management agencies. Currently, only the Gulf of Mexico king mackerel stock is considered overfished.

Annual yields of king mackerel have ranged from 4365 MT to 8772 MT between 1983 and 1998 with an average production of 7648 MT since 1995. Annual catches of Spanish mackerel have ranged from 2784 MT to 5957 MT from 1983 to 1998 with the average catch being 3299 since 1995 (Table 3.1).

Harvest of both species has stabilized in recent years although large fluctuations in estimates of recreational catches in some years have occurred and overages in commercial landings and recreational quotas can occur. The stabilization in yields is thought to be the direct impact of regulations which have been implemented in an effort to sustain future production. The primary management factors contributing to fluctuations in annual recreational harvests include difficulties of enforcement of differential bag limits imposed in individual states, large inter-annual variances in recreational harvest estimates, and regulations that permit the sale of king mackerel from recreational charter boats after the closure of commercial fisheries. Critical research concerns regarding mackerels are sampling concerns related to adequate coverage of the age structure of the stocks and increasing the precision associated with the mackerel assessment abundance indices.

2.6 Sharks

The U.S. Atlantic shark fishery is primarily a southeastern fishery extending from Virginia to Texas. The fishery is now regulated under the Atlantic Highly Migratory Species Fishery Management Plan published in 1999. The plan divides sharks species into "large coastal species" (LCS), "small coastal species" (SCS), and "pelagic species", and set TACs for large coastal and pelagic species. New shark regulations published in 1999 include the following management measures: 1) reduce the annual commercial quota for large coastal sharks from 1,285 Mtdressed weight (dw) to 816 MT dw, apportioned between ridgeback (620 mt dw) and non-ridgeback (196 mt dw) sharks; 2) reduce the annual commercial quota for small coastal sharks from 1,760 MT dw to 359 MT dw, this is 10% higher than 1997 landings; 3) reduce the annual commercial quota for pelagic sharks from 580 MT dw to 488 MT dw and establish a separate annual commercial quota of 92 MT dw for the porbeagle and an annual quota of 273 MT dw for blue sharks, reduce pelagic shark quota by overharvest in blue shark quota; 4) establish a minimum size of 137 cm fork length for ridgeback sharks; 5) reduce the recreational bag limit to 1 shark per vessel per trip from 2 sharks allowed, with a minimum size of 137 cm fork length for all sharks, and an additional 1 Atlantic sharpnose shark per person per trip which used to be a limit of 2; 6) prohibit possession of 19 species of sharks (Atlantic angel, basking, bigeye sand tiger, bigeye sixgill, bigeye thresher, bignose, Caribbean reef, Caribbean sharpnose, dusky, Galapagos, longfin mako, narrowtooth, night, sand tiger, sevengill, sixgill, smalltail, whale and white); and 7) count all sources of mortality, including dead discards and all landings in state waters. The new plan manages 72 species of sharks. The catch-and-release-only, recreational fishing allowance for white sharks is still enforced.

Provisional estimates for 1999 are not yet available for the compete suite of sharks. Estimated catches of sharks by U.S. Atlantic tuna fleet vessels have been provided to ICCAT. In 1998, large coastal shark landings were estimated to be 2,058 mt, slightly higher than the 1997 totals of 1,809 mt, but still a reduction from the peak recorded, 4,600 mt, in 1989. 1998 LCS landings are 67% of those caught in 1995. Total estimated landings for large coastal, small coastal and pelagic sharks were 2,573 mt, 200 mt more than 1997. Catches in numbers for 1998 are estimated to be about 14% higher than 1997 catches. Catch levels higher than the established quota in 1997 and 1998 are attributable to state landings after season closure. Commercial landings are monitored by a system of logbooks and dealer reports. Recreational harvest estimates (provisional) in numbers for 1998 were 151,791 for LCS, 77,924 for SCS, 11,620 for pelagic and 7,666 for unidentified sharks. Recreational landings are estimated by statistical surveys of the recreational catch. Data on landings by species are currently being collected by species for some 27 species of sharks. However, a portion of reported landings remains unidentified.

3. RESEARCH ACTIVITIES

Research activities in 1999 and 2000 focused on several items. Research on development of methodologies to determine the genetic discreetness of large pelagic fishes in the Atlantic was continued. Larval surveys for bluefin tuna and other large pelagics in the Gulf of Mexico was continued. Research continued on development of new methods for estimating and indexing abundance of various large pelagic species, as well as robust estimation techniques for sequential population analyses. Research into estimating discard rates and volumes based on direct observations by scientific fishery observers was also continued. Research was also conducted on approaches for characterization of uncertainty in assessments and methods for translating that uncertainty into risk levels associated with alternative management approaches. U.S. scientists also continued to coordinate efforts for the ICCAT Enhanced Research Program for Billfish and for the Bluefin Year Program.

Collaborative research with scientists from ICCAT member nations and cooperating parties continues. In early 2000, the SEFSC hosted a Brazilian scientist for several months. The intent of this collaboration is to improve our capacity to collaborate on stock assessment research with Brazil. Collaboration with a U.K. and other European Community scientists on topics of evaluation of fishery management-assessment feedback approaches to ICCAT species, continues. A postdoctoral research associate at the University of Miami's Cooperative Unit for Fisheries Education and Research in collaboration with SEFSC scientists has completed an update to the FISHLAB analysis package, which has been broadly distributed within the ICCAT community. The product of this research is expected to enhance stock assessment analysis capabilities in the U.S. and within other ICCAT member nations. Cooperative research by the U.S. NMFS and the INP in Mexico was continued, resulting in joint analyses of longline observer

program data from the Gulf of Mexico fisheries of both countries. Research was undertaken by U.S. and Spanish scientists to evaluate the sensitivity of Atlantic yellowfin tuna assessments to different models, options, and assumptions regarding increasing fishing power in the purse seine fishery.

3.1 Bluefin Tuna Research

As part of its commitment to the Bluefin Program, research supported by the U.S. has concentrated on ichthyoplankton sampling, reproductive biology, methods to evaluate hypotheses about movement patterns, spawning area fidelity and stock structure investigations.

Ichthyoplankton surveys in the Gulf of Mexico during the bluefin spawning season were continued in 1999 and 2000. Data resulting from these surveys which began in 1977 are used to develop a fishery-independent abundance index of spawning west Atlantic bluefin tuna. This index has continued to provide one measure of bluefin abundance that is used in SCRS assessments of the status of the resource.

Studies related to genetic evaluations of the number of fishery management units of Atlantic bluefin are being conducted at several laboratories in the United States. The National Oceanographic and Atmospheric Administration laboratory in Charleston, S. C. is acting as a sample archive center and has tissues from all bluefin collected for stock structure research by the National Marine Fisheries Service since 1996 and some or all samples collected by researchers from various institutions including the University of South Carolina, the Virginia Institute of Marine Science, the University of Maryland and the Massachusetts Department of Marine Fisheries. A summary of tissues collected though mid 1999 are presented (SCRS/00/145). Progress was reported on a study of the genetic composition of 127-190 and 197-277 cm bluefin captured in the west Atlantic and bluefin from multiple year classes caught in the Mediterranean (SCRS/00/147). Results from that work generally indicated that differences in genetic frequencies were primarily within regions rather than between regions; it also indicated that there could be between year class differences within the Mediterranean. Researchers at the Virginia Institute of Marine Science and at Texas A&M University initiated a project in late1999 to try to substantially increase the number of known variable loci for Atlantic bluefin; delays in funding hampered progress on that research but results are anticipated in late 2000 or in 2001.

Scientists from the Texas A&M University, University of Maryland and the National Marine Fisheries Service continued research on the feasibility of using otolith microconstituents to distinguish bluefin stocks. Interlaboratory comparison of Atlantic bluefin tuna otoliths were conducted between U.S. and Canadian laboratories. Results were well within acceptable levels; apart from one element (Mn), differences between labs were relatively minor (generally <6% for four elements and for the two elements for which differences exceeded 5% the abundances of the elements were low and there relative abundances were similar between the labs). Preliminary analyses comparing age 1 bluefin from the west Atlantic and the Mediterranean collected in 1998 indicated good separation (67-89% correctly classified depending on the approach used). Only two age zero fish were collected in the west in 1998, so a statistical comparison of age-0 western Atlantic vs. Mediterranean was not attempted.

Otolith chemistry of age-0 ABT was determined for individuals from several locations (Alboran Sea, Tyrrhenian Sea, Ionian Sea, Ligurian Sea) within the Mediterranean; samples from both 1998 and 1999 were assayed to examine spatial and temporal stability. Otolith signatures from different regions were relatively similar while signatures from similar regions did vary among years suggesting that shifts in ambient water chemistry may be important. Otolith chemistry of juvenile bluefin tuna was measured to assess differences in composition among nursery areas in the western Pacific: East China Sea, Sea of Japan, and Pacific Ocean. Various analyses of bluefin tuna collected in 1994 & 1995 indicated concentrations of four elements (Na, Mg, Mn, Sr) differed among nurseries. Temporal stability of the elemental fingerprint was examined over a three-year period (1995-1997) in the East China Sea. Significant interannual trends were observed for Na, Mg, and Ba; however, differences in elemental fingerprints

among nurseries were greater than temporal variability within a nursery. Efforts to obtain samples both in the west Atlantic and the Mediterranean regions continue.

Research on bluefin tuna movement patterns using electronic tags and on the associated methodology was continued in 1999 and 2000. Tagging activities continued off North Carolina (scientists from Stanford University, Monterey Bay Aquarium and N.M.F.S.) and off northeast North America (by scientists from (1) New England Aquarium, Massachusetts Division of Marine Fisheries. and D.F.O. from Canada and (2) Stanford University and the Monterey Bay Aquarium). Additionally researchers from Stanford University and the Monterey Bay Aquarium continued studying the feasibility of tagging bluefin tuna in the Gulf of Mexico in 1999 and 2000 successfully releasing 4 bluefin with electronic tags in 1999 and about 10 fish in 2000.

A summary of pop-up satellite tagging of giant bluefin tuna in the joint US-Canadian program in the Gulf of Maine and Canadian Atlantic was reported by Lutcavage et al. (SCRS/00/95). Since 1997, 58 singlepoint and 21 light-sensing pop-up archival satellite tags (Microwave Telemetry, Inc., Columbia, MD) were deployed on giant bluefin tuna (178-266 cm SFL) in the western North Atlantic. The goals of the initial deployments were to test external tag attachments and the tags themselves, which evolved to include greater data logging capacity, additional sensors, and increased power. All of the tags were deployed on fish from New England and Canadian commercial or charter fishing vessels (harpoon, rod and reel, trap, and purse seine) using tag attachment techniques developed by the U.S. fishermen (authors Murray, Chaprales, Mendillo, and Genovese). Attachment periods ranged from 5 - 365 days, although the majority of tags detached from the fish over the presumed spawning period (April-July). Tag reporting success rates were 59% for single point tags and 79% (15 out of 19 due) for the archival tags. Three tags (shed from large fish in Canada) reported from land. Without exception, results from 1997-2000 tagging showed that all tagged fish were in the central Atlantic when their tags reported, and 30-58 % annually were within the eastern management area. The high tag reporting success rate was attributed to the experience of fishermen tagging partners, appropriate handling of the bluefin tuna during capture and tagging, careful tag placement, and proper storage and handling of the satellite tags. There are now data capable of depicting full migration paths and environmental associations (80-327 days) of ten fish (193-266 cm). Data successfully returned from the archival tags will generate geolocation estimates and errors associated with light-derived data. In 2000, plans are to deploy pop-up archival tags for 365-500 day attachments. The high level of tag reporting success in the west Atlantic studies was noted by the Group.The success of the long-term attachment of the PSATs enables such questions as spawning site fidelity to be addressed. Some of the discussion focused on the importance of understanding the methods of calculating geolocation, a topic that has recently been addressed at international tagging meetings (see SCRS/00/123).

Results of archival and pop-up tagging of bluefin in the western north Atlantic by the Standford-NMFS group was reported by Block et al.(SCRS/00/145). A total of 380 Atlantic bluefin have been equipped with implantable archival tags or pop-up satellite tags since 1996. Of the 279 implantable archival tags deployed, 30 have been recovered and 21 of these instruments have been returned. Seventy pop-up satellite tags have provided positions, ambient temperature and/or depth movements. This represents 90% of the expected returns from deployed pop-up satellite tags. Data on seasonal movements, trans-Atlantic movement patterns, depth preferences and breeding behaviors have been obtained for fish assumed to be in the age 6-13 range. The authors suggest that bluefin tagged in the west display at least three distinct types of behaviors: (1) western residency with no visitation to spawning areas, (2) western residency with Gulf of Mexico breeding, and (3) trans-Atlantic migrations to the east Atlantic or Mediterranean Sea. Again the high success of the pop-up tags was noted compared to the eastern study. The Group recommended that there be additional releases in the Gulf of Mexico in order to better understand spawning site fidelity.

A workshop on the biology of bluefin in the central Atlantic was held in May 2000 under the sponsorship of the East Coast Tuna Association and the Bermudian government. Electronic tagging results indicated the presence of large, presumably adult bluefin in the north Sargasso Sea during periods when spawning occurs in the Gulf of Mexico

and the Mediterranean Sea raising questions about what they are doing there. A multi-faceted research expedition was recommended (SCRS/00/125).

Research to support assessments and on assessment methods continued. U.S. scientists participated in the SCRS Assessment Methods Meeting in May 2000 and submitted 3 papers on assessment methods. U.S. scientists also participated in the Firth Meeting of the Ad Hoc GFCM/ICCAT Working Group held in Malta and the west Atlantic bluefin working group meeting held in Madrid in September 2000. U.S. scientists presented fourteen papers at that meeting on genetic analyses and tagging results, on basic statistics and indices of abundance and on assessment methods.

3.2 Swordfish Research

In response to ICCAT recommendations, randomized observer sampling of the U.S. large pelagic fleet was continued into 1999. Using fishing vessel performance information provided through submission of mandatory pelagic logbooks by vessel owners and operators, a list of randomly selected vessels was used to derive a sampling fraction of 5% (about 700 observer fishing days per year) of the pelagic longline fleet in the Gulf of Mexico, Caribbean, and Atlantic Ocean since 1992. Observer coverage by the Southeast and Northeast Fisheries Science Centers (SEFSC and NEFSC) successfully recorded effort from 329 observed sets during 1992, 817 during 1993, 648 during 1994, 699 during 1995, 361 during 1996, 455 during 1997, 287 during 1998 and 430 during 1999, corresponding to nominal sampling fractions of about 2.5%, 6%, 5.2%, 5.2%, 2.5%, 3.1%, 2.9% and about 4% respectively.

Data from observer samples were compared against self-reported information in from the U.S. large pelagic mandatory logbook reporting system and estimates of discard mortality of swordfish, billfish, sharks and other species from the U.S. fleet were developed from that analysis for the 2000 SCRS.

Research on the genetics of swordfish in the Atlantic was also continued although no manuscript on the topic was presented to the 2000 SCRS. The analysis conducted by investigators from the FISHTEC consortium, has provided genetic evidence in support of the hypothesis that swordfish from the northwest Atlantic are genetically distinct from those found in the South Atlantic. Genetic variation in introns of the nuclear genes aldolase B (aldB) and the lactate dehydrogenase A (ldhA) was examined and the distribution of alleles was found to be significantly different in samples from the two regions. These results are consistent with those obtained from earlier studies of mitochondrial DNA. Taken together these results provide support for the current practice of dividing the North and South Atlantic into separate management units for swordfish.

In support of monitoring the swordfish stock status in a way that explicitly accounts for the sexually dimorphic growth of swordfish, analyses of catch rate patterns which make use of the sex-specific age slicing algorithms used in the 1999 stock assessment were conducted and reported upon (SCRS/00/144). Fisher reported and observed swordfish catch, size and catch rate patterns through 1999 were examined in support of monitoring the recovery of north Atlantic swordfish. U.S. catch rates from the pelagic longline fleet indicate a somewhat improved condition in 1999 compared to earlier years.

3.3 Yellowfin Tuna Research

A number of studies were conducted by U.S. scientists in cooperation with scientists from other countries. Research was undertaken by U.S. and Spanish scientists to evaluate the sensitivity of Atlantic yellowfin tuna assessments to different models, options, and assumptions regarding increasing fishing power in the purse seine fishery. The results of this research are reported in SCRS/00/70. Cooperative research by the U.S. NMFS and the INP in

Mexico was continued, resulting in joint analyses of longline observer program data from the Gulf of Mexico fisheries of both countries. This research led to the calculation of yellowfin tuna abundance indices, which are presented in SCRS/00/67. Future cooperative research plans include the development of abundance indices for sharks and other tunas, as well as the refinement of the yellowfin tuna indices as additional data becomes available.

Cooperative research on yellowfin tuna abundance indices was also conducted by scientists from Venezuela and the U.S. NMFS. The resulting standardized catch rates for yellowfin tuna from the Venezuelan pelagic longline in the Caribbean Sea and western central Atlantic are presented in SCRS/00/50. Scientists from the U.S. NMFS and Venezuela also continued cooperative research on the spawning of yellowfin tuna in the western central Atlantic, including the Caribbean Sea and the Gulf of Mexico. The condition of ovaries and the presence of hydrated oocytes were used to determine maturity and spawning status, respectively. The results of this study are presented in SCRS/00/46.

U.S. scientists also calculated yellowfin tuna abundance indices using data from the U.S. rod and reel fishery off the U.S. coast from Virginia through Massachusetts (SCRS/00/64) as well as from logbook data reported by the U.S. longline fleet (SCRS/00/65). Yellowfin tuna tag-releases and recaptures from the U.S. Cooperative Tagging Center Program are reviewed in SCRS/00/66.

3.4 Albacore Research

The cooperative research initiated by the U.S. NMFS and the IEO of Spain in 1993 was continued at the NMFS in Miami during August of 1999. A U.S. scientist also provided training to Spanish IEO scientists on the conduct of generalized linear modeling approaches during June, 1999. Further training sessions in late 2000 are also planned In 1999 the effort was extended to analyze the catch per unit of effort data for the Spanish troll and baitboat fisheries using the general linear modeling approach. .

3.5 Mackerels and Small Tunas Research

U.S. small tuna research is directed mainly on king and Spanish mackerel stocks as the amount landed of other small tunas such as cero makerels by U.S. fishermen is very low. The focus of research is collection of primary fishery catch statistics, and biostatistical sample data, fishery age samples, and abundance indices. Because assessment and management are by necessity by geographical units, continued research on migration of king mackerel in particular is important.

3.6 Shark Research

Shark research was conducted in support of the Fishery Management Plan for Highly Migratory Species. A study exploring the biology of the nurse shark has just been completed. Studies delineating shark nursery areas are being conducted to identify regions with concentrations of gravid females and young sharks. Tagging studies are being carried out in Yucatan, Mexico in cooperation with Instituto Nacional de Pesca and Mote Marine Laboratory. These studies are designed to map the nursery areas and migratory patterns of cross-boundary species of sharks. A total of 700 juvenile blacktips sharks have been tagged and released in Mexican nurseries, with a recapture rate of 18.2%. This study is continuing in 1999-2000 with tagging efforts near the U.S/Mexico border. A workshop of collaborators will be held to assess the last five years of data. The bycatch of sharks in the US Atlantic tuna fisheries area is also being monitored and reported to ICCAT through a scientific observer sampling program.

3.7 Billfish Research

Sampling of recreational billfish tournaments continued in 1999 along the U.S. east coast, Gulf of Mexico, Bahamas, and U.S. Caribbean. A total of 161 billfish tournaments were sampled in 1999 (compared to 120 tournaments in 1998). This represented 118,488 hours of fishing effort, an increase of about 29,445 hours from the 1998 level. In 1999, sampling accounted for 241 billfish boated (175 blue marlin, 36 white marlin, 30 sailfish, and 0 spearfish); 2,683 released; and 2,341 tagged-and-released. In comparison, in 1998, there were 245 billfish boated (168 blue marlin, 31 white marlin, 46 sailfish, and 0 spearfish); 2,629 released; and 1332 tagged-and-released). Morphometric measurements of billfish landings were also taken in conjunction with the ICCAT Enhanced Research Program for Billfish (ERPB).

A total of 10 U.S. scientific documents were prespared for and presented to the Fourth ICCAT Billfish Workshop, held in Miami, USA in July 2000. These are summarized below.

Document SCRS/00/52 noted that assessments of sailfish and marlins are usually limited to application of surplus-production models, because the size and age composition of catches are not known. However, even annual catches of these species are unreported in some Atlantic fisheries where they are taken as bycatch. Past billfish assessments have omitted the missing data, an *ad hoc* approach that reduces the credibility of the assessment. In theory, if recent catch and effort data are available for fisheries lacking historical catch data, it should be possible to fit a surplus-production model by estimating historical catches from corresponding data on fishing effort. Enhancements to ASPIC(the computer program used for non-equilibrium surplus-production modeling in previous assessments) for this task were tested on simulated fisheries data generated by a simulation model constructed around life history characteristics of Atlantic blue marlin. The resulting simulated population included sex, size, and age structure on a monthly basis; growth was sexually dimorphic, with females attaining larger asymptotic mean sizes; and size at age was variable. Annual recruitment was determined from spawning biomass with a Beverton-Holt stock-recruitment function, as modified by density-independent stochastic survival. The simulation model was used to generate sample time series of simulated catches and population abundance histories using several alternative assumptions about natural and fishing mortalities, stock-recruitment slopes, and measurement error. The resulting time series of simulated catches and abundances were fitted with and without missing catches using ASPIC. Estimates of maximum sustainable yield (MSY), and the ratios of the most recent year's stock biomass to biomass at MSY (BMSY) and fishing mortality to fishing mortality at MSY (FMSY) were compared to known values from the simulations; results with and without missing catches were contrasted. The results characterized biases most likely arising from dissimilarity of the strongly age structured simulation model and the age aggregated surplus-production model. Nonetheless, fitted values for BMSY and FMSY averaged very near the true values. ASPIC results with missing catches were very similar to those based on complete catch data, but not surprisingly were somewhat more variable.

Document SCRS/00/53 pointed out that the objective of ICCAT resource management is to achieve stock sizes and fishing mortality rates that produce maximum sustainable yield in biomass (MSY). Generally, the model of choice for estimating the condition of the stock relative to MSY has been a surplus-production model. For recent billfish assessments, the surplus-production model has been fitted with computer program ASPIC. An underlying assumption in such estimation of MSY is that indices of population abundance used in fitting are measured in units of biomass. Because of available data, ICCAT billfish assessments have been conducted using indices of abundance (CPUE) in numbers rather than in biomass. This discrepancy is expected to bias estimates of MSY and related benchmarks. Using simulated fisheries data; we evaluated the impact of this substitution on estimates of management benchmarks. The simulation model was constructed around the life history characteristics of Atlantic blue marlin, and explicitly included sex, size, and age structure on a monthly basis. Growth was sexually dimorphic, with females attaining larger asymptotic mean sizes, and size varied about mean size at age. Annual recruitment was determined from spawning biomass with a Beverton-Holt stock-recruitment function, modified by density-independent stochastic survival. For this evaluation, natural mortality M was assumed to decline from 0.5/yr at first recruitment to 0.10/yr

by the age of three, and the slope of the unfished stock-recruitment curve was assumed to be 10. A logistic surplus-production model was fitted to the simulated data sets using ASPIC. Simulations and analyses were performed over the range of estimates of the von Bertalanffy growth parameter k for blue marlin found in the literature. Estimates of management benchmarks differed when numbers- and biomass-based measures of abundance were used in fitting. In summary, biomass-based measures provided generally better fits and estimates of benchmarks closer to the truth. However, those summary results are strongly influenced by cases using the lowest published values of k. For other values of k, estimates from numbers-based CPUE tended to be more accurate than those in from biomass-based CPUE; this result presumably stems from offsetting biases. In the absence of conclusive data on billfish growth rates, the importance of this source of error cannot be quantified precisely. Better understanding of growth in these species would allow more precise quantification of likely biases arising from the use of numbers-based abundance indices.

Document SCRS/00/54 discussed the analyses of blue marlin and white marlin stock structure using mitochondrial DNA, single copy nuclear DNA, and microsatellite DNA are summarized to survey variation across large samples of both species. The levels of variation revealed by the different molecular methodologies varied between species and molecular markers, and was quite high for both mtDNA and the microsatellite loci. Analysis of samples from the same location taken in different years did not reveal significant spatial heterogeneity and allowed us to pool temporal samples to increase the power of spatial analyses. We did not find significant spatial heterogeneity in the distribution of allelic variants for any of the molecular markers. The genetic results are consistent with the natural history of both species--their continuous distribution across the tropics, broad spawning times and areas, and high vagility as adults--and support the hypothesis that blue marlin and white marlin comprise a single stock within the Atlantic Ocean.

Document SCRS/055 reviewed the 1997 ICCAT Commission recommendation that, beginning in 1998, all parties reduce "blue marlin and white marlin landings by at least 25% for each species from 1996 landings, such reduction be accomplished by the end of 1999." This Commission recommendation was based on the SCRS recommendation "that reductions in fishing mortality are necessary to avoid further declines in the stocks and to begin rebuilding these stocks." An evaluation is presented comparing the U.S. blue marlin rod and reel catches in 1999 with 1996, updating the 1998 versus 1996 preliminary comparison (SCRS/99/99). The results of the evaluation presented indicate that in order to achieve a 25% reduction by weight in blue marlin rod and reel landings in year 2000, relative to 1996 landings using minimum size, the minimum size for this species would likely have to be increased to above the current 99 inch lower jaw fork length limit. Higher minima would have greater chances of achieving this implementation for the entire fishing year, and some buffer against further increases in the average size of available blue marlin in 2000 and beyond relative to those available in 1996.

Document SCRS/00/56 provided an update of the historical tag release and recapture files for Atlantic istiophoridae (*i.e*. marlins and sailfish). The sources of data in this update were limited to the Southeast Fisheries Science Center's Cooperative Tagging Center (CTC), The Billfish Foundation (TBF), and the South Carolina's Department of Marine Resources (SCDMR). Data for Istiophoridae are available from 1954 to 2000 for the CTC, from 1990 to 2000 for TBF, and from 1980 to 2000 for SCDMR. The data were presented by agency, gear type, and days at large for Atlantic blue marlin (*Makaira nigricans*), white marlin (*Tetrapturus albidus*), and sailfish (*Istiophorus platypterus*).

Document SCRS/00/57 noted that some components of the U.S. recreational marlin landings are not precisely measured and have not been routinely included in the landings reported to ICCAT. This is reflected by the caveat that these reported landings are "minimum estimates." This paper represented a revision and update of SCRS/99/98 and further explores the possible integration of the U.S. Marine Recreational fishery Statistics Survey (MRFSS) catch estimates and the U.S. Atlantic Recreational Billfish Survey (RBS). The resulting model attempts to estimate total U.S. recreational marlin landings by adjusting for the bias in the relatively precise annual RBS estimates. The bias correction was based on regressions of relatively unbiased, but highly imprecise, MRFSS estimates on the RBS

estimates. The resulting models were used to predict the U.S. recreational landings of Atlantic blue marlin and white marlin for 1981-1999.

Document SCRS/00/58 developed indices of abundance of blue marlin and white marlins from the U.S. recreational tournament and non-tournament fisheries for the period 1973-1999. The indices of abundance in numbers of fish and weight were estimated from numbers of billfish caught and reported to the Recreational Billfish Survey (RBS) program. The standardized indices were estimated using Generalized Linear Mixed Models under a delta lognormal model approach. Factors in the analysis included year, area, season and first-level interactions. The model analyzed the fishing success and effort of each day-location, weighted by the number of boat trips. Model selection, diagnostics and comparison with prior standardized series were presented.

Document SCRS/00/59 developed indices of abundance of blue and white marlins from the United States Pelagic Longline fishery are presented for the period 1986-1999. The index of weight (kg) per 1000 hooks was estimated from numbers of billfish caught and reported in logbooks submitted by commercial fisherman, and from mean annual weight recorded by scientific observers aboard longline vessels since. The standardization analysis procedure included the following variables: year, area, season, gear characteristics (light sticks, main line length, hook density, *etc*) and fishing characteristics (bait type, operations procedure, and target species). The Pelagic Observer Program, collects more detailed information which permitted evaluation of relationships between billfish catch rates and other fishing (hook type and size, main line material and size, rattlers, gangion size and material, etc) or environmental variables (sea-surface temperature, weather condition, wind) for the US longline fishery. The standardized index was estimated using Generalized Linear Mixed Models under a delta lognormal model approach.

Document SCRS/00/60 indicated that size frequencies of catches represent a useful adjunct to catch, effort and abundance information for stock assessment. Size frequencies of blue and white marlin (*Makaira nigricans*, and *Tetrapturus albidus*, respectively) have been collected at U.S. recreational tournaments since 1972. The U.S. National Marine Fisheries Service (NMFS) Marine Recreational Fishing Statistics Survey (MRFSS), and the NMFS Large Pelagic Survey have made limited additional observations of the U.S. recreational marlin catch during dockside interviews of fishermen since 1982 and 1984, respectively. Other size data for marlin are available for U.S. and Venezuelan longline fisheries. These include measurements taken by observers on Venezuelan longline vessels since 1987, and on U.S. vessels since 1989. These data are supplemented with dockside samples of billfish landed in Venezuela beginning in 1987. Length frequencies constructed from these data showed increasing mean sizes in the recreational fisheries in recent years. This trend is the result of the implementation of minimum size regulations that truncated the size distribution of landed fish. This trend is not reflected in the samples from longline fisheries. Sex ratios for both species change from predominately male, or unknown sex at smaller sizes to predominantly female at larger sizes.

Document SCRS/00/61 reviewed attempts to improve the accuracy of stock assessments of blue marlin (*Makaira nigricans*) and white marlin (*Tetrapturus albidus*) using habitat based standardization of CPUEs derived from the longline fishery in the Atlantic Ocean. It has been suggested that by failing to account for the discrepancy between the vertical distribution patterns of marlins and non-traditional fishing effort, a strong bias will be present in the CPUE analysis. This paper examined the approach of estimating CPUEs under the assumption that blue marlin are restricted to a narrow depth and temperature range.

The NMFS SEFSC again played a substantial role in the ICCAT Enhanced Research Program for Billfish in 1999, with SEFSC scientists acting as general coordinator and coordinator for the western Atlantic Ocean. Major accomplishments in 1999 include the following: (1) completion of about 24 at-sea observer trips on Venezuelan longline vessels by October 1999; (2) three of the at-sea observer trips completed were on the larger Korean type vessels that stay out about one month; (3) continuation of the swordfish observer program and biological sampling in Venezuela; (4) continuation of work on shore-based sampling, including billfish tournament sampling in Barbados, St. Maarten, Grenada, Jamaica, Senegal, Cote d'Ivoire, Trinidad and Tobago, and Venezuela; (5) continued efforts

to retrieve tag-recaptured billfish (particularly successful in the southeast Caribbean where more than 165 recaptures were reported in 1999); (6) age and growth sampling of billfish continued in 1999; (7) the western Atlantic coordinator acted as chairman of the newly formed ICCAT tag recovery network in 1999; and (8) SEFSC staff made several extended trips to numerous Caribbean locations in 1999 to assist in coordination of the program and collect data; (9) the Western Atlantic coordinator collaborated with VIMS and Bermuda Department of Fisheries on a popup satellite tagging project of blue marlin to evaluate this technology of estimating post-release survival.

3.8 Tagging

Participants in the Southeast Fisheries Science Center's Cooperative Tagging Center (CTC) tagged and released 2,555 billfishes (including swordfish) and 940 tunas in 1999. This represents a decrease of 2% from 1998 levels for billfish and a decrease of 62% for tunas for the CTC. The Billfish Foundation (TBF) reported tagging 5,929 billfish and 36 tunas for 1999. Among the CTC 1998 billfish releases, there were 963 blue marlin, 451 white marlin, 938 sailfish and 131 swordfish. For CTC tuna releases, there were 627 bluefin tuna, 297 yellowfin tuna, 1 bigeye tuna and 15 releases of other tuna species.

There were 90 billfish recaptures from the CTC reported in 1999, representing a decrease of 1% from 1998. Among the 1999 CTC billfish recaptures there were 30 blue marlin, 14 white marlin, 36 sailfish, and 10 swordfish. The ICCAT Enhanced Research Program for Billfish in the western Atlantic Ocean has continued to assist in reporting tag recaptures to improve the quantity and quality of tag recapture reports, particularly from Venezuela, Barbados and Grenada. For the CTC, a total of 72 tunas were recaptured in 1999, 55 bluefin tuna, and 17 yellowfin tuna. These recaptures represent a decrease of 1% with respect to 1998. The Billfish Foundation recovered a total of 204 tagged billfishes in 1999, including 111 blue marlin, 38 white marlin, 51 sailfish, and 3 swordfish. TBF also reported 9 tunas recaptured in 1999; all 9 bluefin tuna.

There were several noteworthy CTC billfish recaptures during 1999. The longest reported sailfish movement (i.e. minimum straight distance traveled) was 1,160 nautical miles (NM) from a fish released off South Florida (25° 50' N, 80° 0' W) and recaptured off La Guaira, Venezuela (11° N, 66° 50' West) after 2,289 days at large (6.2 years). The longest straight line distance traveled for a blue marlin recaptured in 1999 was 1,699 NM from a fish released off Louisiana coast (28° N, 91° W) and recaptured off La Guaira, Venezuela (11° N, 66° 50' W). Another blue marlin recaptured in 1999 was at large 9.5 years (3473 days), this fish was released and recaptured off La Guaira, Venezuela. The longest straight line distance traveled by a white marlin in 1999 was 1,603 NM from a fish released off Hatteras, North Carolina (37° N, 74° W) and recaptured off La Guaira, Venezuela, after 1,740 days at large.

For bluefin tuna, the longest movement during 1999 (4,247 NM) was from a fish released off Hatteras, N. C. (35° 13' N, 75° 42' W) and recovered off Madeira Islands (Portugal) (14° 8' N, 34° 58' W) 857 days later. There was a trans-Atlantic yellowfin tuna recapture, released off Cape Hatteras, N.C. (38° 10' N, 74° 10' W) and recaptured off the Bay of Biscay, near Spain (34° N, 4° W), a distance of about 3,106 NM, in 779 days. All CTC and TBF release and recapture data for 1999 were made available to ICCAT to supplement its database.

Various electronic tagging efforts directed at bluefin tuna were continued in 1999. Satellite linked pop-off tags and internally implanted archival tags have been placed on numerous bluefin over these past few years. Documents describing results of these studies to date have been prepared and presented to SCRS meetings (SCRS/99/103).

A successful pilot study assessing popup satellite tag technology for estimating post-release survival of blue marlin from recreational vessels off Bermuda (SCRS/99/71) was reported to the 1999 SCRS (SCRS/99/97). This collaborative research effort, between the Virginia Institute of Marine Science (Dr. John Graves and Dave Kerstetter),

the Bermuda Division of Fisheries (Dr. Brian Luckhurst), and the National Marine Fisheries Service (Dr. Eric Prince) was continued in 2000 on longline vessels. Preliminary results from blue marlin tagged from longline vessels are encouraging, with data from 5 out of 7 tagged blue marlin indicating the fish survived the catching and tagging events.

3.9 Fishery Observer Deployments

. *Domestic Longline Observer Coverage*. The NMFS, Southeast Fisheries Science Center (SEFSC), Miami Laboratory initiated, in early 1992, the Pelagic Observer Program for coverage of the U.S. pelagic longline fleet. In conjunction with the Northeast Fisheries Science Center (NEFSC), Woods Hole Laboratory, both regional Centers, using contracted and NMFS observers, have collected catch data while aboard longline vessels fishing in the waters of the northwest Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea. Selection of the vessels is based on a random, 5% sampling of the number of sets reported by the longline fleet. A total of 4,026 sets (2,650,813 hooks) were recorded observed by personnel from the SEFSC and NEFSC programs from May of 1992 to December of 1999. Observers from the SEFSC region recorded over 94,000 fish species (primarily swordfish, tunas, and sharks), marine mammals, turtles, and seabirds during this time period. Observer coverage by the Southeast and Northeast Fisheries Science Centers (SEFSC and NEFSC) successfully recorded effort from 329 observed sets during 1992, 817 during 1993, 648 during 1994, 699 during 1995, 361 during 1996, 455 during 1997, 287 during 1998 and 430 during 1999, corresponding to nominal sampling fractions of about 2.5%, 6%, 5.2%, 5.2%, 2.5%, 3.1%, 2.9% and about 4% respectively.

Southeast U.S. Shark Drift Gillnet Fishery Observer Coverage. The SEFSC Pelagic Observer Program at the Panama City Laboratory observed 53 sets of the shark drift gillnet fishery during 1999. Effort took place in waters off of south Georgia, as well as central and south Florida.

Foreign Fishery Observers. There was no foreign fishing activity in the U.S. Exclusive Economic Zone (EEZ) off the east coast during 1999.

4. Implementation of ICCAT Conservation and Management Measures

Resolution Concerning the Need for New Approaches to Deter Activities That Diminish the Effectiveness of ICCAT Conservation and Management Measures (Rec 99-1) The United States is committed to full participation in ICCAT's efforts to ensure the sustainability of living marine resources in the Convention Area. The United States is actively involved in the FAO initiative to develop an international plan to action (IPOA) to combat IUU, including participating in all meetings related to the development of the IPOA to date. In addition, the United States signed the UN Agreement on Straddling and Highly Migratory Fish Stocks on December 4, 1995, and we ratified that agreement on August 8, 1996. With regard to the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, the United States accepted that agreement on December 19, 1995.

Resolution Endorsing the FAO International Plan of Action for the Management of Fishing Capacity (Rec 99-2) This endorsement of the FAO Plan by the Commission requires no specific action of Contracting Parties. However, the United States was strongly supportive of the efforts to develop an IPOA for the Management of Fishing Capacity and is developing its NPOA as called for by that FAO document.

Recommendation on the Establishment of a Closed Area/Season for the Use of Fish-Aggregation Devices (Rec 99-3) No U.S. action is necessary. The United States does not have any surface fleets fishing in the area covered by this recommendation.

Recommendation Concerning Possible Management Measures for Northern Albacore (Rec 99-4) The United States is already in compliance with the limitation on fishing capacity as described in the 1998 recommendation because of the limited access program that has been implemented for the U.S. pelagic longline fishery. NMFS will continue to provide ICCAT with an annual list of commercial vessels in the directed fishery for northern albacore and will continue to submit the best available catch and effort data to the SCRS in support of scientific assessments.

Recommendation to Extend the Southern Albacore Management Arrangement and to Improve Monitoring (Rec 99-5) The United States must endeavor to limit total catch of southern albacore to no more than 4% of the target catch. We expect that limited access in the pelagic longline fishery and the quota for swordfish, which is the major directed fishery for U.S. vessels in the South Atlantic, will prevent catches of southern albacore from increasing substantially. The recommendation allows approximately 15 mt of southern albacore landings by the United States (based on the U.S. quota of 384 mt ww for South Atlantic swordfish). NMFS intends to monitor the fishery and annually consider whether rulemaking is necessary to limit the total U.S. catch of southern albacore.

Resolution on the Clarification of the Stock Structure and Boundaries Between the Swordfish Stocks in the Atlantic (Rec 99-6) The United States will continue to support the study of swordfish stock structure and boundaries, including genetic analysis, tag recapture studies, and other scientific techniques, to the extent practicable, and will cooperate with the efforts of the SCRS to evaluate the results of these programs.

Recommendation to Establish a Rebuilding Program for North Atlantic Swordfish (Rec 99-7) NMFS is developing a final rule that establishes the U.S. quotas for North Atlantic swordfish for 2000-2002 in accordance with the 1999 ICCAT recommendation. The rule also establishes the U.S. allowance for dead discards for 2000-2002. Together with existing conservation measures, these measures comprise a rebuilding program for North Atlantic swordfish. On August 1, 2000, NMFS established time/area closures in the Gulf of Mexico and off the Atlantic coast of the southern United States in order to minimize bycatch of small swordfish.

Resolution for the Development of Possible Time/Area Closures for North and South Atlantic Swordfish and Gear Modifications to Reduce Undersized Swordfish and Fishing Mortality (Rec 99-8) The United States will continue to provide the SCRS with data on catch at size, by sex, location, and month of capture on the smallest scale possible.

Recommendation Regarding Equatorial Guinea Pursuant to the 1996 Recommendation Regarding Compliance in the Bluefin Tuna and North Atlantic Swordfish Fisheries (Rec 99-9) Publication of a final rule to implement these trade sanctions in the United States is underway, and is expected to enter into force in October 2000.

Recommendation Concerning Import of Bluefin Tuna and its Products from Panama (Rec 99-10)

Publication of a final rule to lift these trade sanctions in the United States is underway, and is expected to enter into force in October 2000.

Recommendation Regarding Belize and Honduras Pursuant to the Swordfish Action Plan (Rec 99-12) Publication of a final rule to implement these trade sanctions in the United States is underway, and is expected to enter into force in October 2000.

Resolution Calling for Further Actions Against Illegal, Unregulated and Unreported Fishing Activities by Large-Scale Longline Vessels (Rec 99-11) No regulatory action is required at this time. Implementation of this resolution will continue to be discussed within the U.S. government. The United States fully supports the Food and Agriculture Organization (FAO) initiative to address the problems associated with IUU fishing.

Resolution on Improving Recreational Fishery Statistics (Rec 99-13) Recreational landings are estimated through a combination of tournament surveys, the Large Pelagic Survey (LPS), the Marine Recreational Fishing Statistics Survey (MRFSS), and state landings data. Final regulations adopted in 1999 require selected HMS charter/headboat vessels that do not already do so to complete a logbook; implementation of this requirement is underway. In 1999, NMFS mandated the registration of all recreational tournaments for highly migratory species. All tournaments are now required to submit landing reports. NMFS has also published an advance notice of proposed rulemaking to request public comment on options to further improve the monitoring of recreationally landed billfish and swordfish [65 FR 48671]. One potential management alternative is to require that a landing tag be affixed to all recreationally landed billfish and swordfish. Information supplied by a landing tag program could provide NMFS with improved catch data for HMS landings outside the tournament context and could help monitor recreational landings against applicable limits.

Recommendation Regarding Atlantic Billfishes (Rec 97-9) The only billfish landings permitted in the United States are recreationally harvested fish, and even in this fishery, catch and release rates are very high (90-95%). Initially, the United States took steps to decrease landings by increasing the minimum size for white marlin to 168 cm (66 inches) and increasing the minimum size for blue marlin to 244 cm (96 inches) [63 FR 14030]. Following the 1998 fishing season, the minimum size for blue marlin was increased further, to 251 cm (99 inches), on September 29, 1998 [63 FR 51859].

NMFS recently published an advance notice of proposed rulemaking requesting the public to comment on options for reducing U.S. recreational landings of Atlantic blue marlin. One possible alternative is to further increase the minimum size. Another alternative is to establish a mandatory catch-and-release format for all Atlantic billfish tournaments.

Registration and Exchange of Information on Bigeye Vessels (Recs 98-2; 98-3)
The United States has submitted a report listing all U.S. commercial vessels of more than 24 meters LOA that reported bigeye tuna landings during 1999. Some of these vessels may fish for bigeye tuna only occasionally, as the list includes all permitted vessels that landed at least one bigeye tuna during the 1999 fishing season.

Regarding the 1998 *Recommendation by ICCAT on the Bigeye Tuna Conservation Measures for Fishing Vessels Larger than 24 m LOA*, note that the United States is exempt from this requirement

under the conditions specified under paragraph 3. Average U.S. catches over the period from 1993 to 1997 were 1,099 mt, which is below the 2,000 mt threshold for applicability of this Recommendation. As such, paragraphs 3 and 4 of the *Recommendation by ICCAT Concerning Registration and Exchange of Information of Bigeye Tuna Fishing Vessels* do not apply to the United States.

Although paragraph 3 of the 1998 *Recommendation by ICCAT on the Bigeye Tuna Conservation Measures for Fishing Vessels Larger than 24 m LOA* exempts the United States from the effort limitations described in paragraphs 1 and 2 of that recommendation, it should be noted that the United States has already implemented a limited access program in the longline fishery for Atlantic tunas, which is the primary gear type for the bigeye tuna fishery. While the number of permits in the longline fishery will not increase in future years, the owner may transfer a limited access permit to another vessel that he owns, or to another person, subject to upgrading restrictions. Thus, the vessel list that was submitted to ICCAT may not be accurate after the 2000 fishing year, if the current owners decide to transfer their permit to another vessel. The United States will provide an updated list of vessels fishing for bigeye on an annual basis.

Finally, it should be noted that the United States has implemented a higher minimum size than that required by ICCAT, which provides additional protection for juvenile bigeye. This minimum size of 27 inches (approximately 6.8 kg) applies to all U.S. fisheries landing bigeye tuna, both commercial and recreational.

Limitation of Fishing Capacity on Northern Albacore (Rec 98-8) In the United States, other than recreational vessels, the primary vessels directing fishing effort on northern albacore are those that use pelagic longline gear. During 1993-1995, vessels fishing for northern albacore did not need an Atlantic tunas permit since they were allowed to fish for Atlantic tunas other than bluefin if they had an Atlantic shark or an Atlantic swordfish permit. Since most landings of northern albacore are taken with pelagic longline gear, and the predominant gear used by permitted swordfish vessels is pelagic longline gear, the number of vessels with Atlantic swordfish permits from 1993-1995 is used as a proxy for the number of vessels directing fishing effort on northern albacore for these years. Thus, the average number of commercial vessels that were permitted to land northern albacore in the United States in the period 1993-95 was approximately 943 vessels. Note that this proxy should be considered an inclusive estimate, since some of these vessels may have fished primarily for swordfish, with very few landings of albacore.

Effective July 1, 1999, the United States implemented limited access for longline vessels permitted to participate in directed Atlantic swordfish and shark fisheries, as well as the Atlantic tunas longline fishery (see 64 FR 29090, May 28, 1999). This limited access program reduced the number of permitted vessels in the longline fishery by approximately 48 percent relative to the average number of permitted longline vessels during 1993-1995. The total number of longline vessels permitted to fish for Atlantic swordfish and Atlantic tunas, including northern albacore, is 455. While the number of permits in the longline fishery will not increase in future years, an owner may transfer a limited access permit to another vessel that he owns, or to another person, subject to upgrading restrictions. The upgrade or transfer may not result in an increase in horsepower of more than 20 percent or an increase of more than 10 percent in length overall, gross registered tonnage, or net tonnage from the vessel's baseline specifications.

In addition to this effort limitation in the longline fishery, it should be noted that although vessels using pair trawls landed a substantial portion of the U.S. total northern albacore landings during the years 1993-1995, pair trawl gear is no longer an allowable gear type for Atlantic tunas.

Recommendation Concerning a Vessel Monitoring System Pilot Program (Rec 97-12) NMFS has published regulations requiring that all fishermen with pelagic longline gear on board fishing in the Atlantic Ocean or Gulf of Mexico must report every hour from a NMFS-approved vessel monitoring system (VMS). This Highly Migratory Species VMS program is a part of a larger nationwide multi-fishery VMS program. NMFS will be able to monitor these vessels in regional offices in order to determine if vessels are fishing inconsistent with U.S. regulations. The implementation date has been delayed by a pending lawsuit from a coalition of pelagic longline fishermen. However, more than 10% of permitted longline vessels have already purchased a VMS unit.

Data Collection and Monitoring Systems

Resolution by ICCAT Concerning the Unreported and Unregulated Catches of Tunas by Large Scale Longline Vessels in the Convention Area (Rec 98-18)
The United States is committed to collecting and examining as much import or landing data and associated information as possible on frozen tuna and tuna-like species. Any findings of interest will be circulated in advance of the Commission meeting. The United States intends to explore options for expanding data collection systems, including over the long term, possible consolidation of all current import monitoring systems for tuna and tuna-like species (Bluefin Statistical Document, Swordfish Certificate of Eligibility, NOAA Form 370, etc.) and expansion of coverage so that all HMS imports are tracked through a universal monitoring system.

Bluefin Tuna Statistical Document Program
All bluefin tuna (Atlantic and Pacific) imported into, or exported from, the United States must be accompanied by a Bluefin Statistical Document (BSD). In the United States, the completed BSD must be sent to NMFS' Northeast Regional Office within 24 hours of a bluefin tuna shipment entering or leaving the country. Data from the BSD are included in Appendix I.

Recommendation Concerning Implementation of an Alternative for the Conservation of Undersized Atlantic Swordfish and the Reduction of Fishing Mortality (Rec 95-10)
To facilitate enforcement of the U.S. minimum size, the import of Atlantic swordfish less than 33 lb (15 kg) dressed weight is prohibited. In 1999, NMFS launched a new program that requires a Certificate of Eligibility for all swordfish imports [64 FR 12903]. This program facilitates the tracking of swordfish shipments into the United States and the enforcement of ICCAT minimum size requirements, and will provide information on international swordfish harvesting and trade activities. The regulations require dealer permitting and reporting for importation of swordfish from any source. Preliminary data on the origins of swordfish imported into the United States that have been collected through the Certificate of Eligibility program from June 1999 through May 2000 are included in Appendix II.

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Recent management actions for Atlantic highly migratory species can be found online at: http://www.nmfs.gov/sfa/hms/finalFMP.html. Federal Register notices containing the full text of proposed and final regulations can be found at: http://www.access.gpo.gov/su_docs/aces/aces140.html.

Other Activities

Appendix I - Bluefin Statistical Document Report (January -December, 1999; January - June, 2000)

Appendix II - Preliminary Swordfish Import Data from the Certificate of Eligibility Program

Appendix III - Swordfish Import Data from U.S. Customs

Appendix IV - List of High Seas Fishing Vessels > 24 m

Appendix V - Enforcement Actions Taken in U.S. Fisheries for Highly Migratory Species

Appendix VI - Compliance Tables for the United States

Appendix I: Bluefin Statistical Document Report, 1999-2000

Appendix II - Preliminary Data from Certificate of Eligibility Program; Jun 1999 - May 2000.
Imports of swordfish into the United States (in metric tons, dressed weight)

	Ocean of Origin			
Flag of Harvesting Vessel	**Atlantic**	**Pacific**	**Indian**	**Total**
Australia	0.0	408.8	17.0	425.8
Barbados	9.4	0.0	0.0	9.4
Brazil	2,763.4	0.0	0.0	2,763.4
Canada	727.6	0.0	0.0	727.6
Chile	0.0	1,866.8	0.0	1,866.8
Columbia	0.0	0.2	0.0	0.2
Costa Rica	0.0	575.9	0.0	575.9
Ecuador	0.0	297.4	0.0	297.4
El Salvador	0.0	25.6	0.0	25.6
Fiji Islands	0.0	118.4	0.0	118.4
Grenada	22.8	0.0	0.0	22.8
Guam	0.0	1.3	0.0	1.3
Indonesia	0.0	0.0	156.3	156.3
Japan	0.0	395.8	0.0	395.8
Mexico	0.0	503.0	0.0	503.0
Micronesia	0.0	0.5	0.0	0.5
Netherland Antilles	1.6	0.0	0.0	1.6
New Zealand	0.0	573.9	0.0	573.9
Panama	2.5	0.7	0.0	3.2
Peru	0.0	9.5	0.0	9.5
Philippines	40.2	76.6	0.0	116.8
Samoa	0.0	5.6	0.0	5.6
Singapore	0.0	42.7	0.0	42.7
South Africa	2,252.5	0.0	4.3	2,256.8
Taiwan	584.6	88.9	8,496.2	9,169.7
Trinidad & Tobago	29.9	0.0	0.0	29.9
United States	4.4	0.0	0.0	4.4
Uruguay	312.8	0.0	0.0	312.8
Venezuela	19.9	0.0	0.0	19.9
Vietnam	0.0	62.4	0.0	62.4
Total	6,771.6	5,054.0	8,673.8	20,499.4

Appendix III - Swordfish Import Data from U.S. Customs, 1999 (in metric tons dressed weight)

Country	Fresh	Steaks Fresh	Frozen	Steaks Frozen	Fillet Frozen	*Totals*
Australia	1130.6	9.4	25.3	0	18.1	*1183.4*
Barbados	38.6	0.5	8.8	0	0	*47.9*
Brazil	1690.5	3.5	110.2	0	0	*1804.2*
Canada	805.2	20.1	0	1.1	0	*826.4*
Chile	1196.5	38.3	0	0	21.7	*1256.5*
China	0	0	0	0	0	*0*
Costa Rica	163.7	1.4	13.2	0	0	*178.3*
EC - Portugal	0	0	0	0	0	*0*
EC - Spain	0	0	0	0	0	*0*
Ecuador	126.8	5.8	0	0	0	*132.6*
El Salvador	7.3	0	0	0	0	*7.3*
Fiji	30.8	0	0	0	0	*30.8*
Grenada	3.2	0	0	0	0	*3.2*
Guatamala	0.4	0	0	0	0	*0.4*
Honduras	0	0	0	0	0	*0*
Iceland	0	0	0	0	0	*0*
Indonesia	0	0	0	0	119.4	*119.4*
Japan	0	0	0	69.6	121.8	*191.4*
Korea	0	0	0	0	0	*0*
Malaysia	0	0	0	18.6	0	*18.6*
Mexico	878.1	0	3.6	0	0	*881.7*
Netherlands Antilles	0	0	0	0	0	*0*
New Zealand	315.6	0	1.4	0	0	*317*
Nicaragua	5.8	0	0	0	0	*5.8*
Panama	0.8	0	0	0	0	*0.8*
Peru	10.6	0	6.1	0	0	*16.7*
Philippines	0	0	0	9	33.7	*42.7*
Saudi Arabia	2.4	0	1.6	0	0	*4*
Singapore	0	0	134.3	303	3814.7	*4252*
South Africa	991.2	0	50.3	0	0	*1041.5*
Taiwan	106.9	0	16.5	0	247.7	*371.1*
Trinidad & Trinidad	518.1	0	7.8	0	0	*525.9*
Uruguay	566.6	1.9	7.7	0.5	0	*576.7*
Venezuela	6.4	0	0	0	0	*6.4*
Vietnam	0	0.3	0	0	0	*0.3*

Customs data do not reflect ocean of origin of product or flag vessel of origin; may include transshipments. Highlighted countries exported swordfish product to the United States in 1999 and have vessels operating in the Atlantic.

Appendix IV - List of U.S. High Seas Vessels > 24 Meters

VESSEL	NAME	Length (m)	(ft)	HPCITY	HPSTATE
942988	VENTURE	30	100	BOSTON	MA
1094559	TRITON	26	86	SEBASTIAN	FL
971771	OC PRINCESS	27	90	OCEAN CITY	MD
987202	MISS CARLA JEAN	29	94	BON SECOUR	AL
1092528	CHRISTINA	24	80	SINGER ISLAND	FL
555759	NIGHT HAWK	27	90	BELMAR	NJ
298093	FRANK H WETMORE	35	116	FALL RIVER	MA
DLDANM	DAN MORE	26	85	WILMINGTON	NC
584638	CAPT JOHN & SON	24	80	PLYMOUTH	MA
685698	WATER SPIRIT	27	90	WILMINGTON	DE
544446	CAPT CASEY	27	87	HOUSTON	TX
526153	VIKING STAR	30	98	MONTAUK	NY
586759	JAMAICA	32	106	BRIELLE	NJ
1038300	FV AMY PHILBRICK	25	82	NEWINGTON	NH
678535	JACQUELINE ROBIN	25	82	PORTSMOUTH	NH
974233	SEA CAPTURE	25	82	MONTAUK	NY
688237	MICHELE JEANNE	25	82	PORTSMOUTH	MA
565381	DORIS MAE IV	27	90	PHILADELPHIA	PA
696098	RIPTIDE III	27	88	NEW YORK	NY
1031300	EULAH MCGRATH	25	82	BOSTON	MA
902889	JENNIFER ANNE	25	82	PORTSMOUTH	NH
697569	AMY MICHELE	25	82	PORTSMOUTH	NH
1027964	CAROL COLES	25	82	BOSTON	MA
529672	ATLANTIS	34	110	BRIELLE	NJ
602308	SUNBEAM EXPRESS	30	100	NEW YORK	NY
554098	MISS BELMAR	27	87	PORT BELMAR	NJ
1030556	PRINCESS CAPT RED	30	100	NEWBURYPORT	MA
683977	CAPT JOHN & SON IV	27	90	PLYMOUTH	MA
622759	AMERICAN RIVER	29	96	WILMINGTON	DE
607577	KEEN LADY IV	29	94	LEWES	DE
570579	ONSE CHIEF II	26	85	ONSET	MA
505821	ADVENTURER	25	81	PORT ARANSAS	TX
634318	TOP FLIGHT	38	125	NORFOLK	VA
285979	DAWN	25	81	BARNEGAT LIGHT	NJ
590629	M/V THUNDERSTAR	32	105	CHARLESTON	SC
585704	VIKING STARSHIP	38	125	MONTAUK	NY
591991	SKIPPER	231	758	BELMAR	NJ
541766	DEN-MARC	25	81	POINT PLEASANT	NJ
699790	BLACK WHALE III	30	100	BEACH HAVEN	NJ
576746	THELMA DALE V	29	96	LEWES	DE
720574	TAMARA K.	25	82	ROAD HARBOUR, BVI	VI
1060744	HELENE	26	86	GLADWYNE	PA
929319	RESTLESS	25	82	MONTAUK	NY
625859	EDNA MAY	25	83	BOSTON	MA
980514	LADY FRANCES	25	83	BOSTON	MA
937930	CHRISTIAN & ALEXA	27	90	NEW YORK	NY
604162	LEGACY	24	80	POINT JUDITH	RI

606024	CHARLOTTE G	24	80	NEW YORK	NY
1056069	ARROWHEAD	24	80	PALM BEACH	FL
631110	PRINCE OF PEACE	24	80	HAMPTON BAYS	NY
619085	PEARL W O'NEAL	26	85	NORFOLK	VA
623839	NATHANIEL LEE	26	85	JAMESTOWN	RI
603955	V J O'NEAL	26	85	NORFOLK	VA
733385	OFF-LINE	25	83	GRAND CAYMAN	VI
973175	KIMBERLY & KATHRYN	24	79	ATLANTIC	NC
517000	ALENTEJO	24	80	NEW BEDFORD	MA
503677	BALD EAGLE	24	80	WANCHESE	NC
666328	TRAVIS & NATALIE	26	84	POINT JUDITH	RI
634649	NELLIE O'NEAL	27	87	NORFOLK	VA
632915	CAPTAIN JAKE O'NEAL	27	87	NORFOLK	VA
947354	SARAH BETH	27	90	PALM BEACH	FL
692947	ROCK N ROLLER	24	79	NEW BEDFORD	MA
661746	MISS WILMA ILENE	26	85	CAPE MAY	NJ
669985	MARDI GRAS	27	88	LAKE CHARLES	LA
631743	MISS VERTIE MAE	27	87	CAPE MAY	NJ
673713	STANLEY O'NEAL	27	90	NORFOLK	VA
693499	NORTH QUEEN	26	84	NEW BEDFORD	MA
636563	DENNY O'NEAL	27	90	NORFOLK	VA
929437	ST BENEDICT	26	85	NEW ORLEANS	LA
603433	RAYDA CHERAMIE	25	82	POINT JUDITH	RI
954436	DYRSTEN	31	102	PHILADELPHIA	PA
693641	WARRIOR	26	84	NEW BEDFORD	MA
930009	KRIS & AMY	26	84	NEW BEDFORD	MA
518410	MT VERNON	24	80	WANCHESE	NC
594749	IBERIA II	24	80	NEW BEDFORD	MA
615829	FORAGER	24	80	PROVIDENCE	RI
613875	MISS BETINA	26	85	POINT JUDITH	RI
584880	JERSEY CAPE	26	86	CAPE MAY	NJ
621074	MISS MILLIE	24	79	MIAMI	FL
581723	SAO PAULO	25	83	NEW BEDFORD	MA
1022773	EAGLE EYE II	24	80	PHILADELPHIA	PA
946982	KATHY ANN	27	90	BARNEGAT LIGHT	NJ
926166	NAVIGATOR	24	79	BOSTON	MA
511094	R/V DAN MOORE	26	85	WILMINGTON	NC
1100109	TWO-CAN	27	88	PORTSMOUTH	NH
671968	CAROLINA DREAM	24	79	NORFOLK	VA
673387	DEBBIE SUE	24	80	WAKEFIELD	RI
553032	GENERAL GEORGE S PATTON	26	86	PORTLAND	PA
585863	MISS LAUREN	25	83	NORFOLK	VA
624326	MISTER BIG	50	165	WANCHESE	NC
948164	LAUREN & MATTHEW	27	87	CARROLLTON	VA
933346	PERCEPTION	26	86	NEW YORK	NY
680986	ROSE MARIE	27	87	BOSTON	MA
522950	OSPREY	24	80	BOSTON	MA
597172	EDWARD L MOORE	24	80	WILMINGTON	DE
944788	YANKEE PRIDE	24	79	NEW YORK	NY
594346	LADY ALICE	26	84	BARNEGAT LIGHT	NJ

947723	PATRIOT	27	87	SHINNECOCK NY
608577	DONA MARIA	25	82	POINT JUDITH RI
607993	CAPT MALC	25	81	NORFOLK VA
1026595	WHITE WATER	26	85	MONTAUK NY
934885	CRYSTAL & REBECCA	27	90	CAPE MAY NJ
683328	OSPREY	30	97	NEW BEDFORD MA
971153	MARY K	26	84	WOODS HOLE MA
664769	JEAN MCCAUSLAND	40	130	NEWINGTON NH
587137	FRANK & MARIA	25	82	NORFOLK VA
691158	CAROL ANN	24	79	BOSTON HARBOR MA
559595	TINA LYNN	27	88	PHILADELPHIA PA
536245	DARANA R	24	80	WANCHESE NC
611248	ORION	28	92	NEW BEDFORD MA
609865	LUTADOR	25	82	BOSTON MA
607685	YVONNE MICHELLE	27	88	CAPE MAY NJ
602713	VIRGINIA SANDS	25	82	NEW BEDFORD MA
596232	PONTOS	25	81	MONTAUK NY
582912	CAPT MANO	25	82	FALLING WATERS WV
603986	SAO MARCOS II	25	82	BOSTON MA
577836	ELISE G	24	80	CAPE MAY NJ
917080	ATLANTIC	30	97	DAVISVILLE RI
933903	GATHERER	30	97	DAVISVILLE RI
692922	JASON & DANIELLE	25	83	NEW YORK CITY NY
600409	AMY MARIE	27	90	CAPE MAY NJ
917620	KATIE PAUL	26	86	STONINGTON MA
613745	SHEARWATER	26	86	PANAMA CITY FL
563802	WESTERN SEA	24	79	BOSTON MA
623188	FRIENDSHIP	30	99	NEW BEDFORD MA
658969	NAUTILUS	26	85	PT JUDITH RI
512153	RIANDA	27	87	NEW BEDFORD MA
680865	CAPT GRUMPY	27	87	PASCAGOULA MS
610983	SUSAN L	26	84	CAPE MAY NJ
623419	TWEEDLES & DONNA	26	84	ATLANTIC NC
1055818	CAP'N WADE	25	83	NEW ORLEANS LA
694706	PERSISTENCE	39	128	BOSTON MA
1059681	LAST DEAL	29	95	DESTIN FL
686108	O'NEAL'S PRIDE	27	90	NORFOLK VA
938786	ISABEL S	25	83	NEW BEDFORD MA
611987	PRISCILLA NOLIN	29	94	NEWINGTON NH
918031	RELENTLESS	42	138	BOSTON MA
936033	SHELAGH K	25	83	BOSTON MA
682332	NANCY ELIZABETH	27	90	PHILADELPHIA PA
617231	COURAGEOUS	25	83	PHILADELPHIA PA
620472	SETTLER	27	90	BOSTON MA
609372	VENTURA	24	79	HOUSTON TX
939087	GAIL ANN	28	93	PHILADELPHIA PA
597355	RUTH AND PAT	25	81	NORTH DARTMOUTH MA
689335	LADY LYNN	30	100	NEW YORK NY
916992	MR O'NEAL	27	90	NORFOLK VA
940494	MIKHAELA LOUISE	25	83	BOSTON MA

661284	HANNAH BODEN	27	87	GLOUCESTER MA
921057	TRADITION	28	92	NEW BEDFORD MA
911804	NORDIC PRIDE	28	93	NEW BEDFORD MA
941588	CAROLINA GIRL II	26	84	NORFOLK VA
944088	GUIDANCE	25	83	NEW BEDFORD MA
618711	FRONTIER	26	85	NEW BEDFORD MA
608248	HUNTRESS I	27	90	POINT JUDITH RI
669492	FLICKA	38	126	CAPE MAY NJ
678575	LESLIE & CHARLES	24	79	ATLANTIC NC
615476	MISS MAUDE	28	91	NORFOLK VA
606937	JANICE LYNELL	27	90	CARROLLTON VA
606623	FOREMOST	25	82	NEW BEDFORD MA
619338	WESTPORT	27	88	NEW BEDFORD MA
941590	KATHY MARIE	27	87	NEW BEDFORD MA
626591	HERITAGE	27	88	BOSTON MA
942213	POLLY ANNA	26	86	PORT ARANSAS TX
657549	ENDURANCE	33	107	NEW BEDFORD MA
932915	PROSPECTOR	26	85	NEW BEDFORD MA
624947	BUZZARDS BAY	26	86	BOSTON MA
638032	KATRINA LEE	25	81	POINT JUDITH RI
646676	RANGER	32	106	NEW YORK NY
590065	KATHY ANN	30	99	NEW BEDFORD MA
606424	ARAHO	32	106	ROCKLAND ME
269525	PARRAMORE BANK	41	136	BON SECOUR AL
610562	ING TOFFER II	28	93	NEWPORT RI
623488	CANTON	27	88	NEW BEDFORD MA
623578	MEGAN MARIE	29	95	MONTAUK NY
621756	GENERATION	27	88	BOSTON MA
690723	WESTERN VENTURE	37	123	NEW BEDFORD MA
672981	WHITE DOVE TOO	37	122	CAPE MAY NJ
596283	SANTA BARBARA	24	80	NEW BEDFORD MA
1020369	SEA ROVER	33	108	WILMINGTON DE
906149	LUKE AND SARAH	34	111	BOSTON MA
1074457	MARLENA	38	126	MONTAUK NY
989516	MOHAWK	30	98	DAVISVILLE RI
601595	VENTURER	27	88	CAPE MAY NJ
1062183	PROVIDIAN	34	113	BATH ME

Appendix V. NOAA ENFORCEMENT ACTIONS TAKEN ON ICCAT SPECIES (September 1, 1999 - August 31, 2000)

During the reporting period, enforcement efforts consisted of dockside monitoring of offloads at major landing facilities in conjunction with dealer record checks, as well as at-sea boardings by the Coast Guard. Enforcement officials detected the following violations within the U.S. Fleet:

Prohibition	Number of Cases	Disposition/Status
Possession of HMS w/o vessel permit	6	Open investigation
	4	Written warnings
	1	Closed - lack of OLE resources
Sale or Purchase w/o permit(s)	1	Open investigation
	1	Written warning
Sale to dealer w/o permit	2	Open investigation
Fail to have permit on board	1	Sent to General Counsel
Fail to record required information	1	Open investigation
Fail to allow an Agent to inspect records	4	Open investigation
	21	Closed - lack of OLE resources
Fail to maintain HMS specified records	1	Open investigation
Possess undersized HMS	1	Summary Settlement
	1	Settlement paid
Violate any provision of M-S Act or ATCA	1	Written warning
Possession of BFT w/o vessel permit	1	Open investigation
	1	Written warning
	3	Sent to General Counsel
Undersized BFT	2	Sent to General Counsel
Exceed catch limit of BFT	2	Open investigation
Import or export BFT w/o permit	1	Open investigation
Fail to cease fishing after catching large/giant BFT	1	Open investigation
Fail to comply w/ restrictions on sale of tuna	4	Open investigation
Fail to comply w/ swordfish restrictions	1	Open investigation
Fail to comply w/ swordfish import COE	1	Open investigation

Provide catch statistics submitted to the SCRS for the current reporting year and any revisions for previous years data.

Panel 1 - bigeye, yellowfin and skipjack tunas

Species/Region	Catch Limit	Catches	Estimated catch over/ under catch limit	Estimated Catch over 15% tolerance of fish below 3.2kg
Bigeye	N/A	1262 mt	N/A	0 mt
Yellowfin	N/A	7569 mt	N/A	0 mt
Skipjack	N/A	152 mt	N/A	N/A

In case of over-harvest, explain how the over-harvest occurred and the actions taken, or to be taken, to prevent further over-harvest:
No overharvests occurred in 1999.

In case of harvest in excess of specified minimum size, explain domestic measures implemented to avoid further overharvest, the monitoring of compliance with domestic measures, and any other actions to be taken to prevent over-harvest:
No overharvests occurred in 1999.

Other comments:

There are no catch limits in place for bigeye, yellowfin or skipjack. The United States has implemented a minimum size for bigeye and yellowfin that corresponds to 6.4 kg (a higher minimum size than the 3.2 kg adopted by ICCAT). There is zero tolerance for fish less than 6.4 kg in both the commercial and recreational U.S. fisheries.

Panel 2 - North Atlantic bluefin tuna and albacore

Species/Region	Catch limit	Catch	Estimated Catch over/under catch limit	Catch of Age 0	Estimated catch over 15% tolerance of fish below 6.4kg	Estimated catch over 8% tolerance of fish below 30kg or 115cm
Western BFT	1387 mt (adjusted to 1435 mt due to 1998 underharvest of 48 mt), including 111 mt of BFT <115 cm	1226 mt landed during the fishing year, including 53 mt of BFT <115 cm	209 mt under the catch limit for the 1999 fishing year	0 mt	0 mt	0
Eastern BFT	N/A	0 mt	N/A	0 mt	0 mt	N/A
N. Albacore	N/A		N/A	0 mt	0 mt	N/A

In case of over-harvest, explain how the over-harvest occurred and the actions taken, or to be taken, to prevent further over-harvest:

No overharvests occurred in 1999.

In case of harvest in excess of specified minimum size, explain domestic measures implemented to avoid further over-harvest, the monitoring of compliance with domestic measures, and any other actions to be taken to prevent over-harvest:
No overharvests occurred in 1999.

Other comments:

The United States has zero tolerance for landings of bluefin less than 6.4 kg. An estimated 30 mt of bluefin were discarded dead during the 1999 calendar year. There were 53 mt of bluefin tuna less than 115 cm landed during 1999, accounting for 4% of the landings quota of 1387 mt. Beginning in 1999, the United States switched from managing bluefin tuna quota on a calendar year basis to a fishing year basis (June 1 through May 31), as was done for swordfish in 1996. The United States used 71 mt of the underharvest from the 1998 calendar year to cover the interim period of January 1, 1999 through May 31, 1999. The remaining 48 mt of underharvest is added to the 1999 fishing year quota. The adjusted 2000 quota will apply for the 12 month period of June 1, 2000 through May 31, 2001.

Panel 3 - South Atlantic albacore

Species/Region	Catch limit	Catches	Estimated catch over/ under catch limit
S. Albacore	15 mt	1.4 mt	0 mt

In case of over-harvest, explain how the over-harvest occurred and the actions taken, or to be taken, to prevent further over-harvest:
No overharvest occurred in 1999.

In case of harvest in excess of specified minimum size, explain domestic measures implemented to avoid further over-harvest, the monitoring of compliance with domestic measures, and any other actions to be taken to prevent over-harvest:
N/A

Other comments: U.S. landings of south Atlantic albacore are limited to 4% of the target catch. Since the U.S. quota for south Atlantic swordfish is 384 mt, the quota for south Atlantic albacore is 15 mt.

Panel 4 - Swordfish

Species/Region	Catch limit (SWO);	Catches (SWO);	Estimated SWO catch over / under catch limit	Estimated SWO catch less than 119 cm
N. Atlantic swordfish	3103 mt ww, (adjusted to 3627 mt ww due to a 1998 underharvest of 524 mt ww)	2896 mt ww landed	731 mt ww underharvest	10.5 mt ww
S. Atlantic swordfish	384 mt ww	51 mt ww landed	333 mt ww underharvest	0 mt

In case of over-harvest, explain how the over-harvest occurred and the actions taken, or to be taken, to prevent further over-harvest:

In case of harvest in excess of specified minimum size, explain domestic measures implemented to avoid further over-harvest, the monitoring of compliance with domestic measures, and any other actions to be taken to prevent over-harvest:

Other comments:
Note that the 1999 fishing year for swordfish in the United States began on June 1, 1999 and ended on May 31, 2000. There was an underharvest of 524 mt ww from the 1998 fishing year quota for the North Atlantic. This excess quota was carried over and added to the 1999 U.S. quota of 3103 mt ww, resulting in an adjusted 1999 U.S. fishing year quota for the North Atlantic of 3627 mt ww. During the 1999 fishing year, U.S. landings totaled 2896 mt ww; thus, the 1999 underharvest of 731 mt ww will be added to the 2000 U.S. quota for North Atlantic swordfish. In the South Atlantic, U.S. landings of swordfish totaled only 51 mt ww, although the available quota was 384 mt ww, resulting in an underharvest of 333 mt ww for the 1999 fishing year.

During the 1999 calendar year, weighout slips showed 10.5 mt dw of swordfish < 33 lb dw. This corresponds to approximately 0.3 % of the U.S. quota for the North Atlantic. There is zero tolerance for Atlantic swordfish that do not meet either the minimum length or the corresponding minimum weight.

Panel 4 (cont.) - Atlantic Billfish

Species/Region	Landings Target (25% reduction from 1996 landings)	Landings (BIL)	Estimated landings in excess of target
Atlantic white marlin	2.5 mt	1.6 mt ww landed	---
Atlantic blue marlin	26 mt	37 mt ww landed	11 mt

In case of over-harvest, explain how the over-harvest occurred and the actions taken, or to be taken, to prevent further over-harvest:

36.9 mt of blue marlin landings were reported for the 1999 calendar year, as compared to reported landings of 35 mt in 1996. However, it should be noted that other methods of comparison indicate that landings of blue marlin have been reduced. *Numbers* of BUM landed during the 1999 calendar year (N=177), as recorded by the Recreational Billfish Survey, were reduced 15 percent from 1996 levels (N=208). Despite the increase in minimum size from 86 inches lower jaw-fork length (LJFL) to 99 inches LJFL and the reduced *number* of BUM landed, harvest during 1999 increased by *weight* due to the increase in the average weight of landed fish.

The United States has taken a series of steps designed to reduce landings of blue marlin, demonstrating a good-faith effort to achieve compliance. Increased size limits have been the primary mechanism utilized to reduce recreational billfish landings by at least 25 percent. The United States established increases in minimum size in March 1998 to 96 inches for BUM (from 86 inches), and 66 inches for WHM (from 63 inches). These size limits were based on the best scientific information available at the time; however, subsequent data indicated that the minimum size of 96 inches was likely not sufficient to achieve the required 25 percent reduction for BUM. Therefore, the size limit for BUM was increased further to 99 inches in September 1998. The most current data indicate that the minimum size limit for BUM would need to be increased to at least 102 inches LJFL in order to meet the 25 percent reduction. In August 2000, the United States published an advance notice of proposed rulemaking that outlines options for improving monitoring and management in the recreational fishery. These options included a further increase in the minimum size for blue marlin, a mandatory tagging program, mandatory catch and release format for tournaments, and the use of circle hooks to minimize post-release mortality. A total prohibition on commercial retention of Atlantic billfish has been in effect in the United States since 1988.