

DRAFT

ENVIRONMENTAL ASSESSMENT

TO CONDUCT SCIENTIFIC RESEARCH EXPERIMENTS USING PELAGIC LONGLINE
GEAR IN PORTIONS OF THE EAST FLORIDA COAST (EFC) AND CHARLESTON BUMP
CLOSED AREAS OF THE ATLANTIC OCEAN

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United States Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Sustainable Fisheries
Highly Migratory Species (HMS) Management Division
1315 East-West Highway
Silver Spring, Maryland 20910

Exempted Fishing Permit to Conduct Scientific Research Experiments Using Pelagic Longline Gear in the East Florida Coast (EFC) and Charleston Bump Closed Areas of the Atlantic Ocean

Final Actions: Consistent with the Magnuson-Stevens Fishery Conservation and Management Act, Atlantic Tunas Convention Act (ATCA), and all other applicable law, authorize a scientific pilot research project to evaluate pelagic longline catches and catch rates of target and non-target species within sections of the Charleston Bump and East Florida Coast (EFC) pelagic longline fishery time-area closures using commercial pelagic longline vessels and specific fishing gear and techniques.

Type of Statement: Environmental Assessment

Lead Agency: National Marine Fisheries Service, Office of Sustainable Fisheries

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Abstract: Under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the National Marine Fisheries Service (NMFS) may authorize activities otherwise prohibited by the regulations contained in Title 50, Part 635 of the Code of Federal Regulations for the conduct of scientific research and the investigation of bycatch. This Environmental Assessment (EA) analyzes the impacts associated with exempting a limited number of pelagic longline vessels from portions of existing area closure requirements to evaluate catches and catch rates of target and non-target species using commercial pelagic longline vessels and specific fishing gear and techniques.

FINDING OF NO SIGNIFICANT ENVIRONMENTAL IMPACT

The Highly Migratory Species (HMS) Management Division of the Office of Sustainable Fisheries submits the attached Environmental Assessment (EA) for the approval of exempted fishing permits (EFPs) to conduct scientific research experiments using pelagic longline (PLL) gear in the East Florida Coast (EFC) and Charleston Bump closed areas of the Atlantic Ocean for Secretarial review under the procedures of the Magnuson-Stevens Fishery Conservation and Management Act. Copies of the EA are available from NMFS at the following address:

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The exempted fishing permits will:

- Allow for the use of pelagic longline fishing gear in portions of the EFC and Charleston Bump closed areas for research; and,
- Allow for the retention and sale of legal species and legal-sized HMS captured during the research project.

The EFPs are necessary to collect baseline PLL fishery data from within portions of the EFC and Charleston Bump closed areas under current fishery conditions to evaluate the effectiveness of existing bycatch reduction measures and collect data necessary to examine the appropriateness of modifying existing area closures to meet current conservation and harvesting goals.

The EA considers information contained in the Environmental Impact Statement (EIS) associated with the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan (Consolidated HMS FMP), the 2006 Stock Assessment and Fishery Evaluation (SAFE) report, and the EA prepared for the June 7, 2007 final rule (72 FR 31688) for the U.S. Atlantic swordfish fishery to enable a more thorough utilization of the U.S. North Atlantic swordfish quota. All information used is herein incorporated by reference.

National Oceanic and Atmospheric Administration Administrative Order 216-6 (NAO 216-6) (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 indicates that the significance of an action should be analyzed both in terms of “context” and “intensity.” Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The

significance of this action is analyzed based on the NAO 216-6 criteria and CEQs “context” and “intensity” criteria.

These include:

1. Can the action be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action?

No. Approval of these exempted fishing permits would not jeopardize the sustainability of any target species, because such catches are expected to be few in number given the limited number of participating vessels and limited levels of effort identified in the study methodology and will be counted against the appropriate species specific quotas. The exempted fishing permits would allow a limited number of domestic fishing vessels the opportunity to conduct catch and bycatch research consistent with conservation and management objectives of the MSA, ATCA, and other applicable law and will not jeopardize the sustainability of target species. Investigation of catch and bycatch rates of specific gears in particular areas may allow for more efficient and targeted bycatch reduction activities, which may enhance efforts to create healthy and sustainable fisheries.

2. Can the action be reasonably expected to jeopardize the sustainability of any non-target species?

The action is not expected to jeopardize the sustainability of any non-target species, because such catches are expected to be few in number given the limited number of participating vessels and limited levels of effort identified in the study methodology and will be counted against the appropriate quotas or take levels. Investigation of catch and bycatch rates of specific gears in particular areas may allow for more efficient and targeted bycatch reduction activities, which may enhance efforts to create healthy and sustainable fisheries.

3. Can the action be reasonably expected to allow substantial damage to the ocean and coastal habitats and/or essential fish habitat (EFH) as defined under the Magnuson-Stevens Act and identified in FMPs?

No. Pelagic longline gear is suspended in the water column and does not contact bottom substrate. The impact of pelagic longline fishing gear on EFH was most recently analyzed in the Consolidated HMS FMP (NMFS 2006), and the impacts on EFH were generally considered negligible, minimal, or low. Because this action is not expected to significantly change fishing practices or effort, this rule is not expected to change the impact of swordfish fishing gear on EFH. Because of the nature of this gear, it is also very unlikely that the habitat for any other target, or prey species, would be altered. Thus, there is no increased danger of damaging U.S. ocean and coastal habitats or EFH.

4. Can the action be reasonably expected to have a substantial adverse impact on public health and safety?

No. The action would impact domestic fishing vessels, which would otherwise be fishing in open areas of the Atlantic Ocean. This action is not expected to have substantial adverse impacts on U.S. public health and safety.

5. Can the action be reasonably expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat of these species?

No. This action will not significantly harm or increase fishery interactions with endangered species or their habitat. There is no increase in fishing effort associated with this activity and participating vessels would be fishing regardless of their participation in this planned research activity. Incidental takes of, or interactions with, protected species that are listed as threatened or endangered under the Endangered Species Act (ESA) taking place under the auspices of an exempted fishing permit would be included against the authorized incidental take levels specified in relevant BiOps. As discussed in the response to question three, because the fishing gear planned for use in this study is suspended in the water column and does not contact bottom substrate, it is unlikely to adversely impact either EFH or critical habitats of threatened or endangered species or marine mammals. In June 2004, NMFS issued a Biological Opinion for the pelagic longline fishery. NMFS reinitiated an ESA Section 7 consultation on the PLL fishery in 2006 based on the number of leatherback sea turtle interactions that had occurred during the period 2004–2006, inclusive. On August 9, 2007, NMFS determined that the basis and assumptions of the 2004 BiOp remain valid, and that the expected effects on the species, the Terms and Conditions, and the Incidental Take Statement (ITS), are still appropriate and do not need to be revised at this time. The predicted interactions would not cause the ITS in the 2004 Biological Opinion for the PLL fishery to be exceeded, and would not be expected to jeopardize the continued existence of sea turtles.

6. Can the action be expected to have a substantial impact on biodiversity and ecosystem function within the affected area (*e.g.*, benthic productivity, predator-prey relationships, etc.)?

No. The action is not expected to result in cumulative adverse effects that could have a substantial effect on target or non-target species. As discussed in questions one and two, the catch level of target and non-target species would not be significantly impacted by this action because of the limited number of participating vessels, the limited number of sets required for this research, and the fact that these vessels would be fishing elsewhere were they not participating in this study. Additionally, participating vessels would still be required to abide by other existing regulations including, but not limited to: circle hook requirements, bait restrictions, careful release protocols, VMS requirements, quotas, retention limits, incidental catch limits, minimum size limits, landing restrictions, a commercial billfish possession prohibition, authorized gears, and observer requirements, among others.

7. Are significant social or economic impacts interrelated with significant natural or physical environmental effects?

No. NMFS has conducted an economic analysis of the proposed scientific research. Given the limited number of vessels participating in this pilot study, the results of these analyses indicate that the economic impacts of these actions would be minimal. Therefore, no interrelated significant natural or physical environmental effects are expected. The exempted fishing permits would allow a limited number of domestic fishing vessels to conduct bycatch research in areas that would otherwise be closed to pelagic longline vessels for the purposes of fishing. The fishermen participating in this research would not be provided monetary compensation, however,

in order to offset economic impacts, participating vessels would be allowed to retain and sell legal species and legal-sized HMS caught under the auspices of an exempted fishing permit.

8. To what degree are the effects on the quality of the human environment expected to be highly controversial?

The effects on the quality of the human environment associated with this action are not expected to be highly controversial, because a significant change in fishing effort or fishing practices is not anticipated. Further, all research would be conducted under strict scientific guidelines. The Consolidated HMS FMP and its associated Environmental Impact Statement fully described the impacts associated with the pelagic longline fishery. There may be some opposition or concern from environmentalists, recreational fishermen, and potentially other interested parties that are opposed to any increase in fishing effort in the EFC and Charleston Bump closed areas. However, the North Atlantic swordfish stock is almost fully rebuilt, and the level of effort proposed in this research study represents approximately 15.5 percent of the effort deployed in the EFC and South Atlantic Bight (SAB) statistical areas in the previous year, and approximately two percent of fleet wide effort in 2006. To reiterate, this action would not increase effort as these vessels would otherwise be actively fishing if this study is not undertaken. This action is not expected to result in landings that would exceed the U.S. swordfish quota, or jeopardize stock rebuilding.

9. Can the action be reasonably expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

No. This action is not expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas. Pelagic longline fishing occurs primarily in offshore areas, and within the upper oceanic water column. Therefore, none of the unique areas listed occur within the action area.

10. To what degree are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Effects on the human environment are not likely to be highly uncertain and do not involve unique risks. The effects of pelagic longline fishing are well known and documented. Approval of exempted fishing permits aimed at reducing bycatch and avoiding regulatory discards would result in predictable, beneficial impacts to the human environment by promoting sustainable HMS fisheries.

11. Is the action related to other actions with individually insignificant, but cumulatively significant impacts?

No. This pilot study is of limited size and duration with a small number of participating boats and a low level of total effort that is not expected to result in cumulative adverse effects that could have a substantial effect on target or non-target species.

12. Is the action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

No. This action is not expected to adversely affect, or cause loss or destruction of, any of the locations listed. Pelagic longline fishing occurs mostly in offshore waters, within the oceanic water column. There are no sites listed, or eligible for listing, in the National Register of Historic Places within the action area.

13. Can the action be reasonably expected to result in the introduction or spread of a non-indigenous species?

No. This action is not expected to result in the introduction or spread of any non-indigenous species as no non-indigenous species will be involved in this study.

14. Is the action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

No, this action is not likely to establish a precedent for future actions as any similar scientific research programs would be evaluated on their individual merits.

15. Can the action be reasonably expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

No. This action is consistent with all other relevant laws.

16. Can the action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

No. This pilot study is of limited size and duration with a small number of participating boats and a low level of total effort. The action affects domestic fishing vessels, which would otherwise be fishing in open areas within U.S. waters. All exempted fishing effort would be conducted under strict scientific guidelines. Increases in fishing effort are not anticipated. Overall, a domestic quota controls catches in the swordfish fishery and many other species with which pelagic longline vessels interact. For the PLL fishery, other current restrictions include limited access permits, time/area closures, circle hook requirements, bait restrictions, careful release protocols, VMS requirements, quotas, retention limits, minimum size limits, landing restrictions, commercial billfish possession prohibition, authorized gears, and dealer and vessel logbook reporting.

DETERMINATION

In view of the information presented in this document and the analyses contained in the attached Environmental Assessment prepared regarding the approval of exempted fishing permits to conduct scientific research experiments using pelagic longline gear in the East Florida Coast (EFC) and South Atlantic Bight (SAB) statistical areas of the Atlantic Ocean, it is hereby determined that this action will not significantly impact the quality of the human environment as described above and in the Environmental Assessment. In addition, all impacts to potentially affected areas, including national, regional and local, have been addressed to reach the

conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

Approved:

Alan D. Risenhoover, Director
Office of Sustainable Fisheries

Date

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1.0 PURPOSE AND NEED FOR ACTION

1.1. Management History

The National Marine Fisheries Service (NMFS) under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Atlantic Tunas Convention Act (ATCA) manages the U.S. fishery for North and South Atlantic swordfish, tunas, and billfish. Under ATCA, the United States is obligated to implement recommendations of the International Commission for the Conservation of Atlantic Tunas (ICCAT), including Atlantic swordfish quotas. ICCAT is an inter-governmental fishery organization, currently consisting of 45 contracting parties, which is responsible for the conservation of tunas and tuna-like species (including swordfish) in the Atlantic Ocean and its adjacent seas. ICCAT meetings are held annually. In addition to being consistent with ICCAT recommendations, swordfish management measures must also comply with the Magnuson-Stevens Act, the Endangered Species Act (ESA), and other domestic laws. For additional information about the management history of the North and South Atlantic swordfish stocks and other highly migratory species, please refer to Section 1.2 below (Need for Action and Objectives) and the Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan (Consolidated HMS FMP) (NMFS, 2006).

1.2. Need for Action and Objectives

The objectives of the original closures that were implemented in Regulatory Amendment 1 to the 1999 FMP (NMFS, 2000) were to 1) maximize the reduction in finfish bycatch; 2) minimize the reduction in the target catch of swordfish and other species; 3) consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and, 4) optimize survival of bycatch and incidental catch species. NMFS still considers these to be valid objectives, and continues to seek ways to implement these management objectives. In the Consolidated Atlantic HMS FMP, NMFS analyzed the anticipated versus actual effects of time/area closures on fishing effort, catch rates, and bycatch rates of both target and non-target species (See Section 4.1.2 of the Consolidated HMS FMP). The analysis indicated that for many species, including sea turtles, the actual reduction in bycatch greatly exceeded the anticipated reduction.

The purpose of this action is to conduct scientific research experiments using pelagic longline gear on a limited number of vessels in the East Florida Coast (EFC) and Charleston Bump closed areas of the Atlantic Ocean, consistent with the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and other domestic regulations. The vessels need exempted fishing permits (EFPs) to authorize activities otherwise prohibited by the regulations contained in Title 50, Part 635 of the Code of Federal Regulations (CFR).

No PLL fishery data has been collected in the EFC and Charleston Bump closed areas since their implementation in 2001. All currently available data regarding catch rates and bycatch interactions from within the closed areas are pre-closure J-hook data. The result is a lack of baseline PLL fishery data from within the closed areas under current fishery conditions, which limits NMFS' ability to evaluate the effectiveness and impacts of existing bycatch reduction measures. Regulations implemented in July 2004 (69 FR 40734) require the Atlantic pelagic longline fleet to use specific size circle hooks, bait types, safe release tools and protocols

in place of traditional J-hooks as management measures to reduce bycatch and bycatch mortality. The impact of circle hooks on the catch of juvenile swordfish catch is not known, and needs to be evaluated within the closure areas.

This pilot study is necessary to collect baseline PLL fishery data from within portions of the EFC and Charleston Bump closed areas under current fishery conditions to evaluate the effectiveness and impacts of existing bycatch reduction measures and collect data necessary to examine the appropriateness of modifying existing area closures to meet current conservation and harvesting goals.

In this EA, NMFS considers the ecological, social, and economic impacts of approving this research study.

2.0 SUMMARY OF THE ALTERNATIVES

This section provides a summary and basis for the alternatives considered in this action. The ecological, economic, and social impacts of these alternatives are discussed in later chapters. Alternatives are not necessarily mutually exclusive and may be combined with one another to authorize scientific research in multiple closed areas.

Alternative 1 Do not conduct research with pelagic longline (PLL) vessels in the Charleston Bump or East Florida Coast closed areas (No Action)

This alternative would maintain existing regulations, which prohibit PLL vessels from fishing in the Charleston Bump closed area from February through April and in the East Florida Coast (EFC) closed area year-round.

Alternative 2 Conduct year-round research with PLL vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the EFC closed area seaward of the axis of the Gulf Stream and north of 30 degrees N. Latitude

This alternative would allow a limited number of PLL vessels (approximately two) to conduct approximately 128 sets (500 hooks per set) within the Charleston Bump and EFC closed areas year-round (Figure 2.1 and Table 2.1a). A total of 256 sets would be conducted inside and outside the closed areas. Vessels would be subject to 100 percent observer coverage with NMFS trained observers or scientific research staff aboard and would be required to adhere to current PLL regulations including dehooking and safe handling protocols for sea turtles and other protected species (July 6, 2004; 69 FR 40734). The scientific research would occur both inside and outside of the Charleston Bump and East Florida Coast closed area. Vessels conducting research in the Charleston Bump and East Florida Coast closed areas would be allowed to retain swordfish and tunas (and sharks subject to applicable quotas, seasons, and retention limits at the time of the research fishery) to offset the operating costs of conducting research fishery operations under NMFS protocols.

Alternative 3 *Conduct year-round research with pelagic longline vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the East Florida Coast closed area seaward of the axis of the Gulf Stream and north of 28 degrees N. Latitude - Preferred Alternative*

This alternative would allow a limited number of PLL vessels (approximately two) to conduct approximately 128 sets (500 hooks per set) within the Charleston Bump and EFC closed areas year-round (Figure 2.1 and Table 2.1a). A total of 256 sets would be conducted inside and outside the closed areas. Vessels would be subject to 100 percent observer coverage with NMFS trained observers or scientific research staff aboard and would be required to adhere to current PLL regulations including dehooking and safe handling protocols for sea turtles and other protected species (July 6, 2004; 69 FR 40734). The scientific research would occur both inside and outside of the Charleston Bump and East Florida Coast closed area. Vessels conducting research in the Charleston Bump and East Florida Coast closed areas would be allowed to retain swordfish and tunas (and sharks subject to applicable quotas, seasons, and retention limits at the time of the research fishery) to offset the operating costs of conducting research fishery operations under NMFS protocols.

Alternative 4: Conduct year-round research with pelagic longline vessels throughout the entire Charleston Bump and East Florida Coast closed areas.

This alternative would allow pelagic longline vessels to conduct research throughout the entire Charleston Bump and East Florida Coast closed areas year-round. Vessels would be subject to 100 percent observer coverage with NMFS trained observers or scientific research staff aboard and would be required to adhere to current PLL regulations including dehooking and safe handling protocols for sea turtles and other protected species (July 6, 2004; 69 FR 40734). The scientific research would occur both inside and outside of the Charleston Bump and East Florida Coast closed area. Vessels conducting research in the Charleston Bump and East Florida Coast closed areas would be allowed to retain swordfish and tunas to offset the operating costs of conducting research fishery operations under NMFS protocols. Based on an examination of historical catch and effort data, this alternative would be expected to result in high levels of bycatch of target species and significant gear conflicts between pelagic longline fishermen and recreational fishermen pursuing Atlantic HMS. Based on the rigorous study design, NMFS anticipates that the data necessary to achieve the objectives of this action can be collected while fishing in subsections of the aforementioned closed areas and simultaneously limiting the bycatch and bycatch mortality of target and non-target species as well as minimizing gear conflicts between user groups. As such, this alternative is not further analyzed in this environmental assessment but may be considered, if necessary and appropriate, in the future.

Alternative 4 was considered but not further analyzed. NMFS has received comments in the past regarding other proposals to conduct research in closed areas that expressed concern about the impact of conducting a research fishery in areas that are heavily utilized by recreational fishermen. As a result, NMFS selected a preferred alternative that limits the research to portions of the EFC and Charleston Bump that are less likely to result in conflicts among user groups. Specifically, NMFS selected areas north of 28 degrees N latitude and seaward of the axis of the

Gulf Stream in the EFC, and seaward of the 200 m isobath in the Charleston Bump, in order to minimize interactions between the research fishery and recreational fishermen. Although there may still be recreational fishing that occurs in these areas, NMFS believes that being further offshore with a limited number of vessels conducting research will reduce any potential impacts. Thus, at this time, NMFS has chosen not to conduct research in areas south of 28 degrees N latitude and in areas landward of the Gulf Stream and the 200 m isobath in the Charleston Bump. As a result, NMFS has not analyzed the potential impacts of conducting research throughout the entire range of the EFC and Charleston Bump. Depending on the outcome of the current research, NMFS may consider conducting additional research in other areas the EFC, Charleston Bump, and other closed areas in the future. NMFS would consider all potential ecological, social and economic impacts at that time.

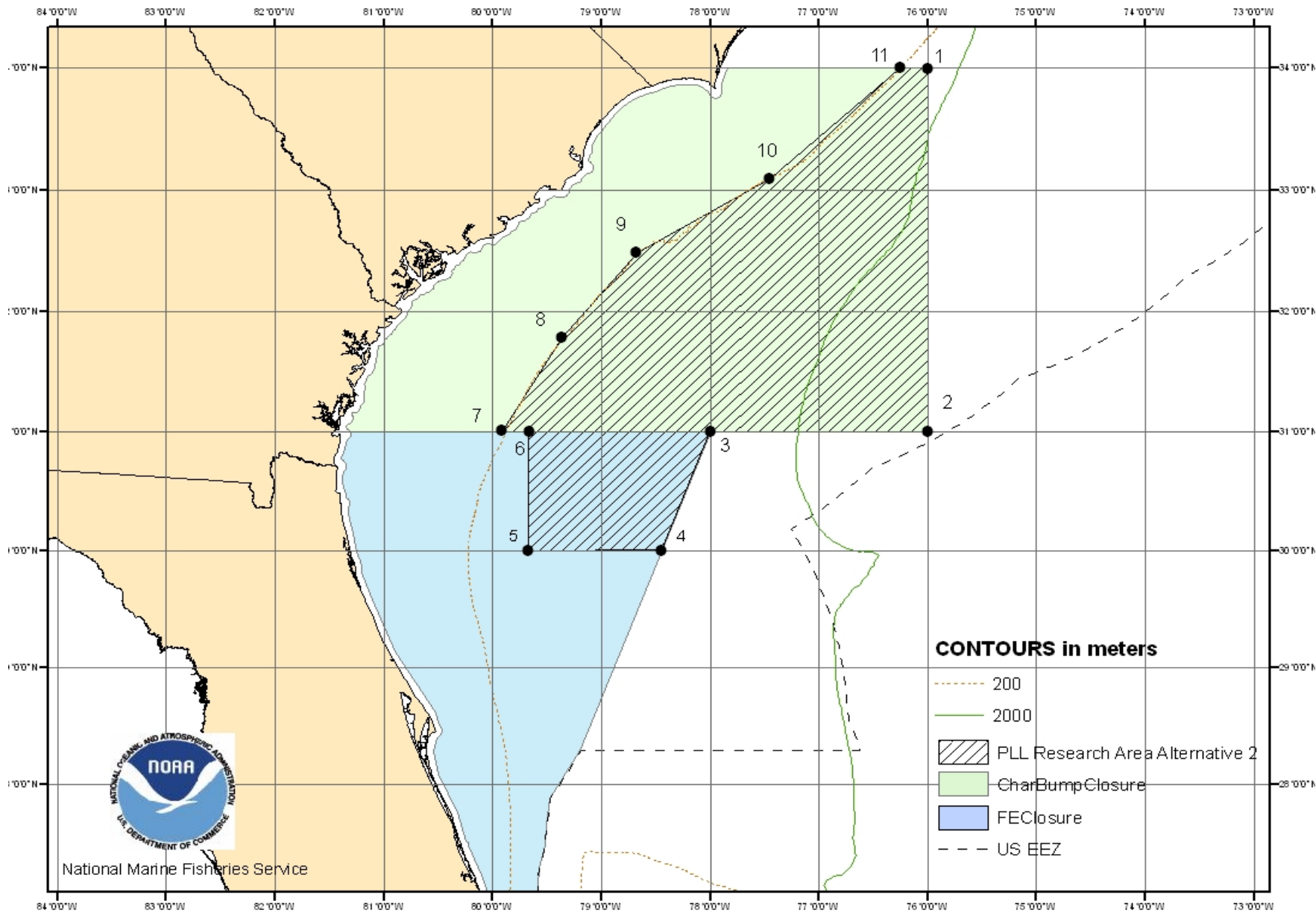


Figure 2.1 Alternative 2 proposed area (in hashed marks) to conduct research using pelagic longline vessels. Coordinates are provided in text beginning with point number 1 and proceeding clockwise to number 11.

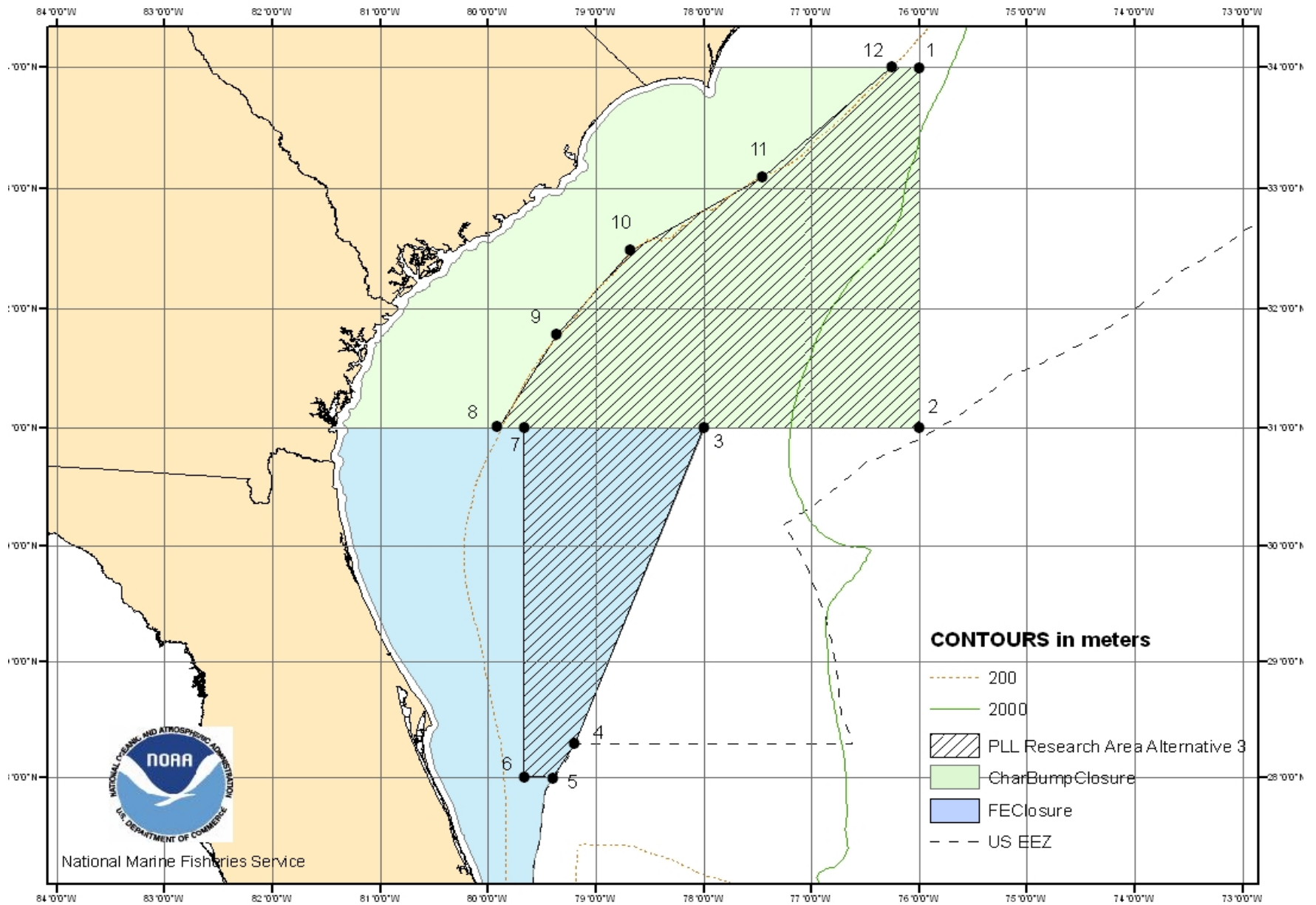


Figure 2.2 Alternative 3 proposed area (in hashed marks) to conduct research using pelagic longline vessels, (Preferred Alternative). Coordinates are provided in text beginning with point number 1 and proceeding clockwise to number 12.

Table 2.1 a and b. Coordinates of the proposed research areas shown in Figures 2.1 and 2.2 beginning with location number 1 and proceeding clockwise through location number 11 or 12 depending on the alternative.

a. Coordinates for Alternative 2 (Figure 2.1)

Point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
1	34°	0'	0"	-76°	0'	0"
2	31°	0'	0"	-76°	0'	0"
3	31°	0'	0"	-78°	0'	0"
4	30°	0'	0"	-78°	26'	35.52"
5	30°	0'	0"	-78°	40'	18.95"
6	31°	0'	0"	-79°	40'	0"
7	31°	0'	0"	-79°	54'	38.8974"
8	31°	47'	7.2018"	-79°	21'	50.475"
9	32°	29'	12.1014"	-78°	40'	21.0324"
10	33°	5'	35.7756"	-77°	27'	15.6954"
11	34°	0'	0"	-76°	15'	26.5098"

b. Coordinates for Alternative 3 (Figure 2.2)

Point	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
1	34°	0'	0"	-76°	0'	0"
2	31°	0'	0"	-76°	0'	0"
3	31°	0'	0"	-78°	0'	0"
4	28°	17'	6.846"	-79°	11'	54.492"
5	28°	0'	0"	-79°	23'	47.9142"
6	28°	0'	0"	-79°	40'	0"
7	31°	0'	0"	-79°	40'	0"
8	31°	0'	0"	-79°	54'	38.8974"
9	31°	47'	7.2018"	-79°	21'	50.475"
10	32°	29'	12.1014"	-78°	40'	21.0324"
11	33°	5'	35.7756"	-77°	27'	15.6954"
12	34°	0'	0"	-76°	15'	26.5098"

3.0 DESCRIPTION OF AFFECTED ENVIRONMENT

Detailed descriptions of the life histories and population status of the species managed by NMFS are presented in Section 3.2 of the 2006 SAFE Report, which is incorporated in the Final Consolidated HMS FMP (NMFS, 2006), and are not repeated here. Detailed information on historical catch and bycatch of HMS by fishery are also provided in Sections 3.4 and 3.8, respectively, of the 2006 SAFE Report in the Final Consolidated HMS FMP (NMFS, 2006), and are not repeated here. The “action area” consists of the pelagic environment in portions of the SAB and EFC statistical areas of the Atlantic Ocean. These areas are described in the Consolidated HMS FMP (NMFS, 2006) in Section 3.3.2.1 (Atlantic Ocean); Section 3.3.2.2 (Gulf of Mexico); and, Section 3.3.2.3 (U.S. Caribbean).

3.1 Status of the Stocks

North Atlantic Swordfish

North Atlantic swordfish are considered overfished, but overfishing is not occurring. A 2006 stock assessment by the Standing Committee on Research and Statistics (SCRS)(SCRS, 2006) indicated that North Atlantic swordfish biomass had improved, possibly due to strong recruitment in the late 1990’s combined with reductions in reported catch since then. The SCRS estimated the biomass of North Atlantic swordfish at the beginning of 2006 (B_{2006}) to be at 99 percent of the biomass necessary to produce maximum sustainable yield (B_{msy}). The 2005 fishing mortality rate (F_{2005}) was estimated to be 0.86 times the fishing mortality rate at maximum sustainable yield (F_{msy}). In other words, in 2006, the North Atlantic swordfish stock is almost fully rebuilt and fishing mortality is low. Although there is some uncertainty associated with this conclusion, almost half of the current biomass estimates were greater than or equal to B_{msy} . The SCRS indicated that if the current total allowable catch (TAC) management strategy is maintained, the stock is likely to remain near the level that would produce MSY.

South Atlantic Swordfish

The stock status of South Atlantic swordfish is considered to be good. The current estimated fishing mortality rate is likely below that which would produce MSY, and the current biomass is likely above that which would result from fishing at F_{msy} in the long term. The estimated MSY is 33 percent higher than current reported landings. While the SCRS believes the southern swordfish stock appears to be in a healthy condition at present, it is unclear if substantially higher catches than currently envisioned by ICCAT could be sustained in the long term, due to divergent views of stock status when using targeted and bycatch fisheries indicators in a simple production model.

Detailed information on additional HMS species can be found in Table 3.1 below and in the 2006 SAFE Report, which is incorporated in the Final Consolidated HMS FMP (NMFS, 2006) and is not repeated here.

Table 3.1 Stock Assessment Summary Table. Source: SCRS, 2004, 2005, 2006; Cortes, 2002, and Cortes et al. 2002.

Species	Current Relative Biomass Level	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Threshold	Outlook**
West Atlantic Bluefin Tuna	$SSB_{04}/SSB_{MSY} = 0.41$ $SSB_{04}/SSB_{75} = 0.18$	$0.86SSB_{MSY}$	$F_{01}/F_{MSY} = 1.7$ $F_{01}/F_{MSY} = 3.1$	$F_{year}/F_{MSY} = 1.00$	Overfished; overfishing is occurring.
East Atlantic Bluefin Tuna	$SSB_{00}/SSB_{70} = 0.48$	<i>Not estimated</i>	$F_{00}/F_{max} = 3.4$	<i>Not estimated</i>	Overfished; overfishing is occurring.*
Atlantic Bigeye Tuna	$B_{03}/B_{MSY} = 0.85-1.07$	$0.6B_{MSY}$ (age 2+)	$F_{02}/F_{MSY} = 0.73-1.01$	$F_{year}/F_{MSY} = 1.00$	Overfished; overfishing is occurring.
Atlantic Yellowfin Tuna	$B_{01}/B_{MSY} = 0.73 - 1.10$	$0.5B_{MSY}$ (age 2+)	$F_{01}/F_{MSY} = 0.87- 1.46$	$F_{year}/F_{MSY} = 1.00$	Approaching an overfished condition.
North Atlantic Albacore Tuna	$B_{00}/B_{MSY} = 0.68$ (0.52-0.86)	$0.7B_{MSY}$	$F_{00}/F_{MSY} = 1.10$ (0.99 - 1.30)	$F_{year}/F_{MSY} = 1.00$	Overfished; overfishing is occurring.
South Atlantic Albacore Tuna	$B_{02}/B_{MSY} = 1.66$ (0.74-1.81)	<i>Not estimated</i>	$F_{02}/F_{MSY} = 0.62$ (0.46-1.48)	<i>Not estimated</i>	Not overfished; overfishing not occurring.*
West Atlantic Skipjack Tuna	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>	$F_{year}/F_{MSY} = 1.00$	Unknown
North Atlantic Swordfish	$B_{06}/B_{MSY} = 0.99$ (0.87 -1.27)	<i>Unknown</i>	$F_{05}/F_{MSY} = 0.86$ (0.65 - 1.04)	$F_{year}/F_{MSY} = 1.00$	Overfished; Overfishing is not occurring
South Atlantic Swordfish	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>	$F_{year}/F_{MSY} = 1.00$	Unknown
Blue Marlin	$B_{04} < B_{MSY} = \text{Yes}$	$0.9B_{MSY}$	$F_{2004} > F_{MSY} = \text{Yes}$	$F_{year}/F_{MSY} = 1.00$	Overfished: overfishing is occurring
White Marlin	$B_{04} < B_{MSY} = \text{Yes}$	$0.85B_{MSY}$	$F_{2004} > F_{MSY} = \text{Possibly}$	$F_{year}/F_{MSY} = 1.00$	Overfished: overfishing is possibly occurring

3.2 Fishery Participants, Gear Types, and Affected Area

Additional information about the operation of U.S. HMS fisheries can be found in the 2006 SAFE Report, which is incorporated in the Final Consolidated HMS FMP (NMFS,

2006). The Final Consolidated HMS FMP provides detailed information about the operation and management of the commercial HMS pelagic longline fishery, including international and domestic management measures and permitting and reporting requirements.

3.3 Habitat

The 2006 SAFE Report included in the Final Consolidated HMS FMP addresses the habitat utilized by the various species targeted by the pelagic longline fishery. Typically, the fisheries targeting swordfish and tunas exist offshore in deeper waters within the water column, so there is no interaction with bottom substrate.

3.4 Catch and Bycatch

U.S. pelagic longline catch (including bycatch, incidental catch, and target catch) is largely related to vessel and gear characteristics, but is summarized for the whole fishery in Table 3.1. U.S. pelagic longline landings of Atlantic swordfish and tunas for 1999-2006 are summarized in Table 3.2.

Table 3.2 Reported Catch of Species Caught by U.S. Atlantic Pelagic Longlines, in Number of Fish, for 1999 - 2006. Source: Pelagic Longline Logbook Data based on calendar year.

Species	1999	2000	2001	2002	2003	2004	2005	2006
Swordfish Kept	67,120	62,978	47,560	49,320	51,835	46,440	41,139	38,241
Swordfish Discarded	20,558	17,074	13,993	13,035	11,829	10,675	11,134	8,900
Blue Marlin Discarded	1,253	1,443	635	1,175	595	712	567	439
White Marlin Discarded	1,969	1,261	848	1,438	809	1,053	989	557
Sailfish Discarded	1,407	1,091	356	379	277	424	367	277
Spearfish Discarded	151	78	137	148	108	172	150	142
Bluefin Tuna Kept	263	235	177	178	273	475	375	261
Bluefin Tuna Discarded	604	737	348	585	881	1,031	765	833
Bigeye, Albacore, Yellowfin, Skipjack Tunas Kept	114,438	94,136	80,466	79,917	63,321	76,962	57,132	73,058
Pelagic Sharks Kept	2,894	3,065	3,460	2,987	3,037	3,440	3,149	2,098
Pelagic Sharks Discarded	28,967	28,046	23,813	22,828	21,705	25,355	21,550	24,113
Large Coastal Sharks Kept	6,382	7,896	6,478	4,077	5,326	2,292	3,362	1,768
Large Coastal Sharks Discarded	5,442	6,973	4,836	3,815	4,813	5,230	5,877	5,326
Dolphin Kept	31,536	29,125	27,586	30,384	29,372	38,769	25,707	25,658
Wahoo Kept	5,136	4,193	3,068	4,188	3,919	4,633	3,348	3,608
Turtles Discarded	631	271	424	465	399	369	152	128
<i>Number of Hooks (X 1,000)</i>	<i>7,902</i>	<i>7,976</i>	<i>7,564</i>	<i>7,150</i>	<i>7,008</i>	<i>7,276</i>	<i>5,911</i>	<i>5,662</i>

Table 3.3 Reported Landings in the U.S. Atlantic Pelagic Longline Fishery (in mt ww) for 1999 – 2006, based on calendar year. Source: NMFS, 2004a; NMFS, 2005; NMFS 2007.

Species	1999	2000	2001	2002	2003	2004	2005	2006
Yellowfin Tuna	3,374	2,901	2,201	2,573	2,154	2,489	1,745	2004
Skipjack Tuna	2.0	1.8	4.3	2.5	4.2	0.7	0.6	0.2
Bigeye Tuna	929.1	531.9	682.4	535.8	284.9	308.7	312	517
Bluefin Tuna	73.5	66.1	37.5	49.9	81.4	96.1	81	57.6
N. Albacore Tuna	194.5	147.3	193.8	155	110.9	117.4	108.4	100.4
Swordfish N.*	3,362.4	3,315.8	2,483	2,598.8	2,772.1	2,551	2,273	1,947.2
Swordfish S.*	185.2	143.8	43.2	199.9	20.9	15.7	0	0

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

3.5 Protected Species

For detailed information on Biological Opinions (BiOps) for the HMS pelagic longline fishery, please refer to Section 3.9.9.2 of the Final Consolidated HMS FMP (NMFS, 2006). The Final Consolidated HMS FMP also describes the Reasonable and Prudent Measures and Terms and Conditions implemented pursuant to the BiOps for sea turtles. Additionally, the Final Consolidated HMS FMP discusses marine mammal interactions with HMS fisheries and the impact of the Marine Mammal Protection Act (MMPA) on HMS management.

In 2006, the primary species of marine mammal with which the Atlantic pelagic longline fishery interacted was pilot whales. The total estimated number of pilot whale interactions in this fishery during 2006 was 268 (range: 151 - 474), with a total of 184 estimated to have suffered serious injury or death. In contrast, there were no Risso's dolphin interactions observed in this fishery during 2006, which is consistent with a decreasing trend occurring since 2003. There were also an estimated 27 interactions with unidentified species of dolphins, and 13 estimated interactions with unidentified species marine mammals in 2006 (Fairfield-Walsh and Garrison, 2007).

Since implementation of circle hook requirements in the pelagic longline fishery, aggregate interactions with leatherback sea turtles have declined from 1362 in 2004 to 415 in 2006. Aggregate loggerhead sea turtle interactions declined from 734 in 2004 to 561 in 2006 (Fairfield-Walsh and Garrison, 2007). Sea turtle interactions increased for both species between 2005 and 2006, however, as noted above, 2006 levels remained well below 2004 levels. Additional detailed historical information on pelagic longline interactions with Atlantic sea turtles and marine mammals can be found in the 2006 Consolidated HMS FMP and the 2006 SAFE Report.

On December 22, 2006, NMFS Office of Sustainable Fisheries (SF) requested reinitiation of the Endangered Species Act (ESA) section 7 consultation process for the pelagic longline fishery. On August 9, 2007, NMFS Office of Protected Resources (PR)

determined that the basis and assumptions of the 2004 BiOp remain valid, and that the expected effects on the species, the Terms and Conditions, and the ITS, are still appropriate and do not need to be revised at this time.

Table 3.4 Estimated number of leatherback and loggerhead sea turtle interactions in the U.S. Atlantic pelagic longline fishery, 2002 - 2006 by statistical area. Sources: Garrison and Walsh, 2007; Garrison and Walsh, 2006; Garrison, 2005; Garrison and Richards, 2004; Garrison 2003.

Area	Leatherback					Loggerhead				
	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
CAR	0	0	17	2	4	43	36	61	40	17
GOM	695	838	780	179	28	170	135	45	19	40
EFC	100	27	64	62	110	99	137	99	0	17
SAB	93	75	164	7	39	22	52	194	34	18
MAB	70	94	184	11	30	94	18	92	54	70
NEC	5	76	33	6	73	147	241	150	67	135
NED	0	0	98	63	116	0	0	52	20	235
SAR	0	0	18	20	14	0	70	41	38	19
NCA	0	2	0	0	1	0	39	0	3	10
TUN	0	0	0	0	-	0	0	0	0	--
TUS	0	0	0	0	-	0	0	0	0	--
Total	962	1113	1359	351	415	575	728	734	275	561
NED exp'tal fishery (2001-03)	158	79	--	--	--	100	92	--	--	--
Exp'tal fishery (2004-05)	--	--	3	17	--	--	--	0	8	--
Total	1120	1192	1362	368	415	675	820	734	283	561

4.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

The environmental, social, and economic consequences of the alternatives considered are described below and in Chapters 6.0, 7.0, and 8.0. As described in Chapter 2, the alternatives considered for conducting scientific research in the closed areas are outlined below.

4.1 Specifically Authorized Activities Alternatives

- Alternative 1 Do not conduct research with PLL vessels in the Charleston Bump or East Florida Coast closed areas (No Action)
- Alternative 2 Conduct year-round research with PLL vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the East Florida Coast closed area seaward of the axis of the Gulf Stream and north of 30 degrees N. Latitude
- Alternative 3 *Conduct year-round research with PLL vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the East Florida Coast closed area seaward of the axis of the Gulf Stream and north of 28 degrees N. Latitude - Preferred Alternative*
- Alternative 4: Conduct year-round research with PLL vessels throughout the entire Charleston Bump and East Florida Coast closed areas.

Ecological Impacts

Under Alternative 1, the no action alternative, NMFS would not conduct scientific research with PLL vessels in the Charleston Bump or EFC closed areas. NMFS would continue to enforce the prohibition on pelagic longline vessels fishing in the closed areas. NMFS closed the Charleston Bump and EFC closed areas in March 2001 to reduce bycatch of juvenile swordfish and other species of concern and the areas have remained closed to PLL vessels since then. Maintaining the closed areas would continue to provide positive ecological benefits in terms of limiting bycatch and bycatch mortality, however, NMFS would not be able to determine the effectiveness of current bycatch reduction measures that were implemented in the fishery after the closed areas went into effect. In addition to the closures, NMFS has implemented a number of other management measures including, but not limited to, observer programs, logbook and dealer reporting requirements, limited access permits, gear requirements to reduce bycatch, seasons, quotas, trip limits, retention limits, and prohibited species lists. All of these requirements would remain in effect under all of the proposed alternatives.

In addition to the Charleston Bump and EFC closed areas, the DeSoto Canyon and Northeastern U.S. (NEC) closures were implemented in late 2000 and early 2001, respectively. NMFS also implemented the Northeast Distant (NED) closed area in 2001 due to exceeding the incidental take level for sea turtles, and conducted an experimental fishery

from 2001-2003 to test the effectiveness of circle hooks with specific bait combinations. Those experiments led, in part, to Agency rulemaking in 2004 to require the use circle hooks, bait requirements, sea turtle handling and release equipment, safe handling and release protocols, and protected species workshops throughout the PLL fishery.

The objectives of the original closures that were implemented in Regulatory Amendment 1 to the 1999 FMP (NMFS, 2000) were to 1) maximize the reduction in finfish bycatch; 2) minimize the reduction in the target catch of swordfish and other species; 3) consider impacts on the incidental catch of other species to minimize or reduce incidental catch levels; and, 4) optimize survival of bycatch and incidental catch species. NMFS still considers these to be valid objectives, and continues to seek ways to implement these management objectives.

In the Consolidated Atlantic HMS FMP, NMFS analyzed the anticipated versus actual effects of time/area closures on fishing effort, catch rates, and bycatch rates of both target and non-target species (See Section 4.1.2 of the Consolidated HMS FMP). The combined effects of the individual area closures were examined by comparing the 2001-2003 catch and discards to the averages for 1997-1999 throughout the entire U.S. Atlantic fishery. Changes in the numbers of fish caught and discarded were compared to the predicted values from Regulatory Amendment 1 to the 1999 FMP. Overall effort, expressed as the number of hooks set, declined by 15 percent between the two time periods. Declines were noted for both the numbers of kept and discards of all species examined including swordfish, tunas, sharks, billfish, and sea turtles. The number of reported discards of swordfish, bluefin and bigeye tuna, pelagic sharks, dolphin, wahoo, blue and white marlin, sailfish, and spearfish all declined by more than 30 percent. The reported discards of blue and white marlin declined by about 50 percent and sailfish discards declined by almost 75 percent. The reported number of sea turtles caught and released declined by almost 28 percent.

The reported declines in swordfish kept and discarded, large coastal sharks kept and discarded, and dolphin kept, were similar to the predicted values developed for Regulatory Amendment 1. Reported discards of bluefin tuna, pelagic sharks, all billfish (with the exception of spearfish for which no predicted change was developed in Regulatory Amendment 1), sea turtles, and total BAYS tunas kept all declined more than the predicted values. As a result, NMFS does not consider the minimal amount of additional catch or bycatch that may result from the research fishery to undermine the effectiveness, or the original intent of, the existing time/area closures. For many of the species of most concern (i.e., bluefin tuna, billfish, and sea turtles), the closures have exceeded predictions in terms of the percent reduction in bycatch. NMFS considers the proposed research fishery in the EFC and Charleston Bump an important aspect of further improving NMFS' ability to further refine its bycatch reduction strategy.

Under Alternatives 2 and 3, NMFS would conduct scientific research using a limited number of vessels (approximately two) in portions of the Charleston Bump and East Florida Coast closed areas (Figure 2.1 for Alternative 2, and Figure 2.2 for Alternative 3) referred to hereafter as the Charleston Bump and EFC proposed research areas. The proposed research

area in the Charleston Bump would be located seaward of the 200 m isobath (~100 fathoms) and the proposed research area in the EFC for Alternative 2 would be north of 30 degrees N latitude, and for Alternative 3 north of 28 degrees N. Latitude with bounding coordinates provided in Table 2.1. The Charleston Bump proposed research area is identical for Alternatives 2 and 3. As described in further detail below, based on both the PLL logbook and pelagic observer program (POP) data, the results of the analysis for Alternatives 2 and 3 indicate that the proposed research would not have a negative impact on target or non-target species, including protected species such as sea turtles.

For Alternatives 2 and 3, the PLL vessels would make approximately 11 sets per month in each of the proposed research areas with 500 hooks per set inside and outside the closed areas for a total fishing effort of 5500 hooks per month in each research area (Charleston Bump and EFC). The time and area closures have been in effect since 2001, and a number of new bycatch reduction and mitigation measures, including circle hook requirements, bait restrictions, and disentanglement and release training and gear requirements, have been implemented in the PLL fishery since that time. Swordfish stocks have also recovered to sustainable levels since that time, and NMFS is in need of new information on current catch and bycatch rates in the closed areas to effectively manage the fishery. All currently available data regarding catch and bycatch rates within the closed areas are pre-closure J-hook data. The result is a lack of baseline PLL fishery data from within the closed areas under current fishery conditions, which limits NMFS' ability to evaluate the effectiveness of existing bycatch reduction measures.

Two variables that cannot be accounted for, and that have the potential to influence the results of the research fishery, are the current status of the stocks versus the status of the stocks in 1995-2000, and the influence of circle hooks on catch rates. Data from the Northeast Distant (NED) Experimental Area indicate that circle hooks may have higher catch rates for some species and lower catch rates for other species relative to J-hooks, but bycatch mortality rates are also lower due to hooking locations (in the mouth as opposed to gut-hooked) and the effectiveness of hook removal on incidentally captured species. To the extent that neither of these variables can be accurately predicted, the actual results of the research fishery may be either higher or lower than the predicted values. In particular, NMFS anticipates that the number of dead discards will be greatly reduced using the 18/0 circle hooks with offsets not to exceed 10 degrees. One of the goals of the proposed research is to collect the data needed to address these and other questions, particularly in the closed areas.

NMFS analyzed the PLL logbook and POP data from 1995-2000 to determine historic catch and potential impacts of the research fishery on target and non-target species in the proposed research area. For both the PLL logbook and POP data, NMFS used a Geographic Information System (GIS) to select all sets that occurred in the proposed research area from 1995-2000 and summed the total number of each target and non-target species retained (kept) or discarded (alive or dead) during the 6-year period in the Charleston Bump and EFC proposed research areas. For the PLL logbook data, swordfish and tunas are shown for Alternative 2 in Table 4.5a and Table 4.6a, billfish and sea turtles in Table 4.10a and Table 4.11a, and sharks in Table 4.15a and Table 4.16a. Similar tables are provided for

Alternative 3. The spatial distribution of PLL logbook catches from 1995-2000 is shown for swordfish in Figure 4.1, yellowfin tuna in Figure 4.2, bluefin tuna in Figure 4.3, billfish in Figure 4.4, spearfish and sailfish in Figure 4.5, sea turtles in Figure 4.6, sandbar sharks in Figure 4.7, and dusky sharks in Figure 4.8.

For the POP data, swordfish and tunas are shown for Alternatives 2 and 3 in Table 4.20 through Table 4.24, billfish and sea turtles in Table 4.25 through Table 4.29, and sharks in Table 4.30 through Table 4.34.

Since the Charleston Bump is closed to vessels fishing with PLL gear during three months out of the year (February 1 through April 30), NMFS analyzed data from the Charleston Bump for those three months only. Although NMFS is proposing to fish in both areas year-round, NMFS only analyzed the data from the Charleston Bump during these 3 months because NMFS is trying to determine the ecological impacts of fishing in the areas that are closed. Since the Charleston Bump is open to vessels fishing commercially with pelagic longline gear throughout the remainder of the year (May through January), NMFS did not analyze the impacts of the research fishery during those months as this effort would be part of normal fishing operations.

The total proposed fishing effort of 256 sets would be distributed equally with 128 sets inside and 128 sets outside the closed areas over the course of a year. The research fishery would conduct an average of 11 sets per month with 500 hooks per set for a total of 5,500 hooks per month in each area. NMFS only analyzed the impacts of the proposed research inside the closed areas since, as noted above, fishing effort outside the closed area is considered part of normal fishing operations. During the months of February through April, NMFS would potentially make 11 sets in both the EFC and Charleston Bump areas for a total of 22 sets per month or 11,000 hooks per month for those three months. The analysis below thus includes the potential addition of 33 sets in the Charleston Bump (11 per month for 3 months) proposed research area from February through April for a total of 289 sets (256+33). NMFS used this approach to provide a maximum estimate of potential fishing effort and associated bycatch that could occur in the closed areas as a result of the research.

For comparative purposes, fishing effort in the research fishery would average 27 percent of historic fishing effort in the closed areas under Alternative 2 (Table 4.1), and 24 percent of historic fishing effort in the closed areas under Alternative 3 (Table 4.2).

To analyze the impacts on target catch, for both PLL logbook and POP data, NMFS summed the total catch over six years (1995-2000) in the Charleston Bump (Table 4.5a) and EFC proposed research areas (Table 4.6a). NMFS then calculated the average monthly catch for each species kept, discarded alive, or discarded dead from the Charleston Bump (Table 4.5b) and for the EFC proposed research areas (Table 4.6b) as well as the catch per unit effort (CPUE) for the Charleston Bump (Table 4.5c) and the EFC (Table 4.6c). The monthly CPUE for each species was then used to calculate the predicted number of each species that would potentially be kept or discarded in the research fishery in the Charleston Bump (Table 4.5d) and EFC (Table 4.6d). The data from the Charleston Bump were then combined with

the EFC data to provide a comprehensive estimate of species kept, discarded alive, or discarded dead in the two proposed research areas combined (Table 4.7).

NMFS used the same approach described above to estimate bycatch of billfish, sea turtles, and sharks in the Charleston Bump (Table 4.10 and Table 4.15) and EFC (Table 4.11 and Table 4.16), using both PLL logbook and POP data. Sequentially, the PLL logbook data are shown first for each alternative and all species in Table 4.5 through Table 4.19, followed by the POP data in Table 4.20 through Table 4.34. A summary table (Table 4.3) shows the number of all species that could potentially be kept, discarded alive, or discarded dead for Alternatives 2 and 3 based on the PLL logbook data Table 4.3, and a. A similar summary table (Table 4.4) based on POP data for all species kept and discarded is also provided in Table 4.4. In the caption for each table, NMFS has highlighted whether it is based on PLL logbook or POP data.

Under Alternative 2, based on pre-closure J-hook data from the 1995-2000 PLL logbooks, the proposed research fishery would potentially result in a total of 1,232 swordfish kept, 201 swordfish discarded alive, and 325 swordfish discarded dead. Since only two bluefin tuna were reported caught over six years in the Charleston Bump and none in the EFC, <1 bluefin tuna (mathematically calculated at 0.03) are predicted to be kept, with none discarded alive or dead during the research fishery. The only other target species that is predicted to be retained in any significant number would be yellowfin tuna, for which 312 would be kept, 16 discarded alive, and 7 discarded dead (Table 4.3 and Table 4.7). Table 4.3 provides a summary of all targeted catch, whereas Table 4.7 shows the monthly breakdown of catch.

Results based on the POP data for targeted species were similar to those for PLL. For example, for Alternative 2, 1,109 swordfish would potentially be kept, 1,049 swordfish discarded alive, and 408 swordfish discarded dead (Table 4.4). No bluefin tuna are expected to be encountered, and yellowfin numbers are similar to those based on the PLL data (Table 4.4).

For non-target species, based on PLL logbook data, Alternative 2 would potentially result in total of 9 white marlin live discards and 1 dead discard, and 28 blue marlin live discards and 5 dead discards (Table 4.12). For sea turtles, less than one interaction is expected to occur across all species combined (Table 4.12). For sharks, a total of 170 LCS are predicted to be kept¹, 125 discarded alive, and 69 discarded dead; 19 pelagic sharks are predicted to be kept, 82 discarded alive, and 17 discarded dead; 37 sandbar sharks are predicted to be kept, 6 discarded alive, and 3 discarded dead; and for dusky sharks, 41 are predicted to be kept², 25 discarded dead, and 6 discarded alive (Table 4.17). Any retention of sharks would be subject to applicable quotas, seasons, and retention limits at the time of the research fishery.

¹ Any retention of sharks would be subject to regulations in place at that time, including applicable quotas, seasons, and retention limits.

² Dusky sharks were prohibited in 2000, thus landings were reported prior to that in years 1995-1999. No dusky sharks would be retained in the research fishery.

For non-target species, based on POP data, Alternative 2 would potentially result in total of 17 white marlin discarded alive and 9 discarded dead, and 2 blue marlin discarded alive and 2 discarded dead (Table 4.4 and Table 4.29). For sea turtles, two interactions with leatherbacks and 4 interactions with loggerheads are expected to occur (Table 4.4 and Table 4.29). For sharks, a total of 128 LCS are predicted to be kept, 230 discarded alive, and 265 discarded dead; 14 pelagic sharks are predicted to be kept, 73 discarded alive, and 145 discarded dead; and 1 sandbar discard and 17 dusky discards are anticipated (Table 4.4).

Under Alternative 3, the proposed research fishery would potentially result in a total of 1,047 swordfish kept, 182 swordfish discarded alive, and 266 swordfish discarded dead. Similar to Alternative 2, since only two bluefin tuna were reported caught in the Charleston Bump and three in the EFC over six years, <1 bluefin tuna is predicted to be kept, with <1 discarded alive or dead during the research fishery. The only other target species that are predicted to be retained in any significant number would be yellowfin tuna, for which 348 would be kept, 15 discarded alive, and 5 discarded dead, and bigeye tuna for which 73 are predicted to be kept and 6 discarded alive (Table 4.9).

For non-target species, Alternative 3 would potentially result in total of 12 white marlin live discards and 2 dead discards, and 22 blue marlin live discards and 5 dead discards (Table 4.14). For sea turtles, less than one interaction is expected to occur across all species combined (Table 4.14). For sharks, a total of 113 LCS are predicted to be kept, 124 discarded alive, and 50 discarded dead; 21 pelagic sharks are predicted to be kept, 81 discarded alive, and 11 discarded dead; 58 sandbar sharks are predicted to be kept, 8 discarded alive, and 3 discarded dead; and for dusky sharks, 47 are predicted to be kept, 20 discarded dead, and 6 discarded alive (Table 4.19).

Alternative 3 is the preferred alternative because it would allow the Agency to conduct research in the EFC and Charleston Bump closed areas to best determine the effectiveness of bycatch reduction measures that were recently implemented in the fishery. Specifically, the closures went into effect in 2001 when the fishery was operating under J-hooks and the swordfish stock was overfished. Currently, the swordfish stock is nearly rebuilt, $B = 0.99B_{MSY}$, and several measures have been taken to further minimize bycatch and post-release mortality of bycatch in the fishery. NMFS requires additional information to determine the effectiveness of new circle hooks and bycatch mitigation gear such as the sea turtle handling and release equipment that is now required aboard all PLL vessels.

Alternative 3 would allow a limited research fishery (approximately two vessels) designed to collect the necessary information on catch rates, bycatch rates, discard rates, interaction rates with protected species, size of target species, hooking location, mortality at haul back, and evaluation of the condition of fish at haul back to allow post-release mortality estimates, while minimizing any adverse effects of the research fishery itself on managed stocks or protected species. Alternative 3 is the preferred alternative because it would allow NMFS to conduct research in a slightly larger area than Alternative 2 and thus provides greater flexibility in determining set locations and implementing an appropriate research design. The overall ecological impacts of Alternative 3 are anticipated to be minor, particularly on species that are of greatest concern such as sea turtles, bluefin tuna, and blue

and white marlin. Even though the area encompassed by Alternative 3 is slightly larger than area in Alternative 2, fewer numbers of many of the species are predicted to be caught due to lower catch rates in Alternative 3.

Social and Economic Impacts

Under Alternative 1, there would continue to be existing adverse social or economic impacts of the current time and area closures for pelagic longline fishermen. These adverse economic impacts include lost revenues from decreased landings and additional expenditures for fuel by forcing some fishermen to increase steaming time to the fishing grounds. Increased steaming time has a negative social impact by forcing fishermen to be away from port for longer periods of time. Alternative 1 would maintain the existing socio-economic benefits that accrue to the recreational fishing sector, including the charter/headboat fleet, as result of the current time-area closures, by avoiding commercial/recreational gear conflicts and competition for fish between sectors. Not conducting research represents the no action alternative and would not change fishing practices or revenues from the fishery in any way.

Alternatives 2 and 3 would also not result in any significant social or economic impacts. The proposed research areas are located within existing time/area closures that have been closed to PLL fishing since early 2001. Alternatives 2 and 3 may have minimal positive socio-economic impacts for the commercial pelagic longline sector by potentially allowing two vessels minor increases in landings and potentially decreasing fuel and other expenditures and reducing time away from port as a result of decreased steaming time. Additional minimal positive socio-economic benefits may be realized by processors, wholesalers, and dealers in Florida or South Carolina, depending upon where the catch is offloaded. A limited number of vessels are proposed to participate in the research, and although they would be allowed to retain any legal species and legal-sized tunas and swordfish, the goal of the research is not to increase harvests but rather to collect scientifically valid information on catch and bycatch rates within the closed areas. The projected number of swordfish and tunas to be caught for research purposes is not likely to have a substantial economic or social impact. NMFS would allow the sale of targeted species in order to facilitate participation and to provide a financial incentive for vessels to conduct the research. Without an incentive, and without any other form of compensation to cover the cost of fuel, gear, bait, ice, and crew, it is unlikely that vessels would be willing to participate in the research. Thus, although a limited number of swordfish and tunas may be sold as a result of the research, it is unlikely to have notable a social or economic impact on small businesses or communities.

There are likely to be perceived adverse socio-ecological impacts to recreational fishing community. Negative social impacts associated with conducting this research may occur in communities with high numbers of recreational anglers who target swordfish and tunas. Many anglers believe, correctly or not, that even a limited return of PLL fishing in a strictly controlled setting will harm recreational catches. Regardless of actual impacts, which are anticipated to be minimal, this action will likely be perceived to negatively impact recreational fishing. The East Coast of Florida is the primary area that would be sensitive to any potential impacts on the recreational fishing sector given the large recreational fishing

presence in that location. In previous requests for EFPs in this region, NMFS has received substantial opposition from the recreational sector. NMFS anticipates that concerns may be partially mitigated due to the strictly controlled experimentation and NMFS oversight.

There is a potential to create incentives for future cooperative research ventures between regulatory agencies and industry representatives if such research is perceived as useful for reducing bycatch in areas where regulatory discards are high and if the information gained is transferred to other countries with similar concerns regarding transboundary species. While administrative costs to the agency are higher, in terms of monitoring (i.e., 100% observer coverage as a term and condition of permit) and enforcing exempted fishing activities under Alternatives 2 and 3, the benefits gained from technological advances in bycatch and bycatch mortality reduction, both to the fishery and to the regulatory agency, far outweigh the administrative costs incurred.

Additional information pertaining to the economic impacts associated with Alternatives 1, 2, 3 are provided in Chapter 6 of this document.

Conclusion

Given the limited size, scope, and duration of the proposed research project, NMFS does not anticipate the preferred alternative to result in any significant ecological, social, or economic impacts. Given recent management measures that have been implemented throughout the PLL fishery, NMFS proposes to collect information that would improve the Agency's ability to measure the effectiveness of bycatch reduction measures, particularly in closed areas where data has not been collected in several years. The information and data collected as part of the research would also help the Agency to consider potential modifications to existing time/area closures in the future.

4.2 Impacts on Essential Fish Habitat

This action is not anticipated to have an impact on essential fish habitat (EFH). The only gear that is proposed to be used is pelagic longline gear which has minimal or no impact on EFH for HMS or other species. Pelagic longline gear is typically fished in the water column where it does not come into contact with the benthic substrate. Thus, no impacts to benthic habitat or other EFH are anticipated.

4.3 Impacts on Other Finfish Species

The research being proposed under this Environmental Assessment is not expected to significantly alter U.S. fishing practices or effort and therefore should not have any noticeable impact on other finfish species that have not already been considered in the Consolidated HMS FMP.

4.4 Impacts on Protected Species Listed under the Endangered Species Act or Marine Mammal Protection Act

On September 7, 2000, NMFS reinitiated formal consultation for all HMS commercial fisheries under Section 7 of the ESA. A Biological Opinion (BiOp) issued June 14, 2001, concluded that continued operation of the Atlantic pelagic longline fishery is likely to jeopardize the continued existence of endangered and threatened sea turtle species under NMFS jurisdiction. This BiOp also concluded that the continued operation of the purse seine and handgear fisheries may adversely affect, but are not likely to jeopardize, the continued existence of any endangered or threatened species under NMFS jurisdiction. NMFS has implemented the reasonable and prudent alternatives (RPAs) required by this BiOp.

In January 2004, NMFS reinitiated consultation after receiving data that indicated the Atlantic pelagic longline fishery exceeded the incidental take statement for leatherback sea turtles in 2001–2002 and for loggerhead sea turtles in 2002. In the spring of 2004, NMFS released a proposed rule that would require fishermen to use certain hook and bait types and take other measures to reduce sea turtle takes and mortality. On June 1, 2004, the NMFS Office of Protected Resources issued a BiOp on the pelagic longline fishery. The 2004 BiOp found that the continued operation of the fishery was not likely to jeopardize the continued existence of loggerhead, green, hawksbill, Kemp’s ridley, or olive ridley sea turtles, but was likely to jeopardize the continued existence of leatherback sea turtles. The 2004 BiOp identified RPAs necessary to avoid jeopardizing leatherbacks, and listed the reasonable and prudent measures (RPMs) and terms and conditions necessary to authorize continued take as part of the revised incidental take statement. On July 6, 2004, NMFS published a final rule (69 FR 40734) implementing additional sea turtle bycatch and bycatch mortality mitigation measures for all Atlantic vessels with pelagic longline gear onboard, including many gear and bait restrictions and requiring certain handling and release tools and methods.

NMFS also published an Advance Notice of Proposed Rulemaking to receive comments on how to further reduce sea turtle mortality (69 FR 49858, August 12, 2004), held several workshops to demonstrate sea turtle release equipment and techniques (69 FR 44513), and released revised sea turtle handling and release placards, protocols, and a video. The placards, protocols, and video are available in English, Spanish, and Vietnamese. In the 2006 Consolidated HMS FMP, NMFS also implemented a requirement for all vessel owners and operators to attend protected species handling and release workshops.

NMFS continues to monitor the sea turtle takes in the pelagic longline fishery and may need to take further action if sea turtle takes do not remain below the levels specified in the June 2004 BiOp. NMFS is implementing the other RPMs in compliance with the 2004 BiOp.

In December 2006, NMFS Highly Migratory Species Management Division preliminarily estimated that the PLL fishery had exceeded the allowable take for leatherback sea turtles under the incidental take statement (ITS) for the PLL fishery and reinitiated Section 7 consultation with NMFS Office of Protected Resources. On August 9, 2007, the NMFS Office of Protected Resources determined that the basis and assumptions of the 2004

BiOp remain valid and concluded that the continued operation of the PLL fishery would not jeopardize the continued existence of leatherback sea turtles.

4.5 Environmental Justice Concerns

Executive Order 12898 requires that federal actions address environmental justice in the decision-making process. In particular, the environmental effects of the actions should not have a disproportionate effect on minority and low-income communities. The approval of the exempted fishing permits in this document would not have any effects on human health. Additionally, the exempted fishing permits are not expected to have any social or economic effects and should not have a disproportionate effect on minority and low-income communities.

4.6 Comparison of Alternatives

NMFS does not anticipate that the preferred alternative will either individually or cumulatively with other actions result in significant ecological, social, or economic impacts.

4.7 Cumulative Impacts of the Alternatives

On May 28, 1999, NMFS published a final rule (64 FR 29090) that implemented the HMS FMP and Amendment One to the Atlantic Billfish FMP, and that consolidated regulations for Atlantic HMS into one C.F.R. part. The Final Environmental Impact Statements (FEIS) associated with these FMPs addressed the rebuilding and ongoing management of Atlantic tunas, swordfish, sharks, and billfish. Alternatives to rebuild and manage the Atlantic swordfish and tuna fisheries included, among other things, quotas levels, retention and size limits, upgrading restrictions, overharvest and underharvest adjustment authority, time/area closures, and permitting and reporting requirements, including a limited access system. The HMS FMP concluded that the cumulative long-term impacts of these and other management measures would be to rebuild overfished fisheries, minimize bycatch and bycatch mortality, to the extent practicable; identify and protect essential fish habitat; and minimize adverse impacts of fisheries regulations on fishing communities, to the extent practicable.

Since the HMS FMP, NMFS has finalized three supplemental environmental impact statements that affect pelagic longline fishing. The first one, published in June 2000, analyzed management measures, particularly time area closures, to reduce bycatch, bycatch mortality, and incidental catch in the pelagic longline fishery. The final actions were expected to have negative direct, indirect, and cumulative economic and social impacts for pelagic longline fishermen and were expected to have positive benefits regarding reduction in bycatch and bycatch mortality.

The second supplemental environmental impact statement, published in July 2002, implemented the measures in a June 14, 2001, BiOp addressing sea turtle bycatch and bycatch mortality in HMS fisheries. Certain measures in this rulemaking, such as the closure of the Northeast Distant Area (NED) to pelagic longline vessels, were expected to have

negative direct, indirect, and cumulative economic and social impacts on pelagic longline fishermen, that were mitigated in the short-term for vessels that participated in an experimental fishery in the NED. Other measures, such as requiring gangions to be 10 percent longer than floatlines, requiring the use of corrodible, non-stainless steel hooks, reporting lethal sea turtle takes within 48 hours, and posting sea turtle handling and release guidelines in the wheelhouse were not expected to have serious impacts.

The third supplemental environmental impact statement, published on July 6, 2004 (69 FR 40734), to implement measures intended to reduce sea turtle interactions in the pelagic longline fishery. The June 2004 BiOp associated with this action found that the continued operation of the fishery was not likely to jeopardize the continued existence of loggerhead, green, hawksbill, Kemp's ridley, or olive ridley sea turtles, but was likely to jeopardize the continued existence of leatherback sea turtles. The BiOp established incidental take statements for leatherback and loggerhead sea turtles and implemented measures designed to reduce sea turtle interactions and mortalities in compliance with the ESA and other applicable law.

NMFS published the Final Consolidated Atlantic HMS FMP in July 2006 (July 14, 2006, 71 FR 40096), that included, among other things, mandatory workshops for the safe handling and release of protected species, shark identification workshops, rebuilding and preventing overfishing of several HMS, changes to the bluefin tuna quota management structure, authorization of additional gears, and a comprehensive review of all new HMS EFH information.

Since the publication of the Consolidated HMS FMP, the Atlantic swordfish fishery was also modified by rulemaking in 2007 that changed several upgrading restrictions for vessels, increased the swordfish retention limits of limited access incidental permit holders, and increased retention limits of charter/ headboat and Angling category permits (June 7, 2007, 72 FR 31688), and swordfish quota specifications were finalized in 2007 (Oct 5, 2007, 72 FR 59629). A billfish tournament requirement to use circle hooks with natural bait and natural bait/artificial combinations was suspended in early 2007 (May 11, 2007, 72 FR 26735), but the requirement will be reinstated effective January 1, 2008.

Taking into consideration the Consolidated Atlantic HMS FMP, previous and subsequent rulemaking for various bycatch reduction and additional safe handling equipment requirements, and the July 2004 rule implementing additional sea turtle bycatch reduction measures in the PLL fishery, NMFS does not expect any adverse significant cumulative impacts from the preferred alternative outlined above. The authorization of this scientific research is not expected to change interactions with protected species or result in significant cumulative impacts in addition to those previously analyzed.

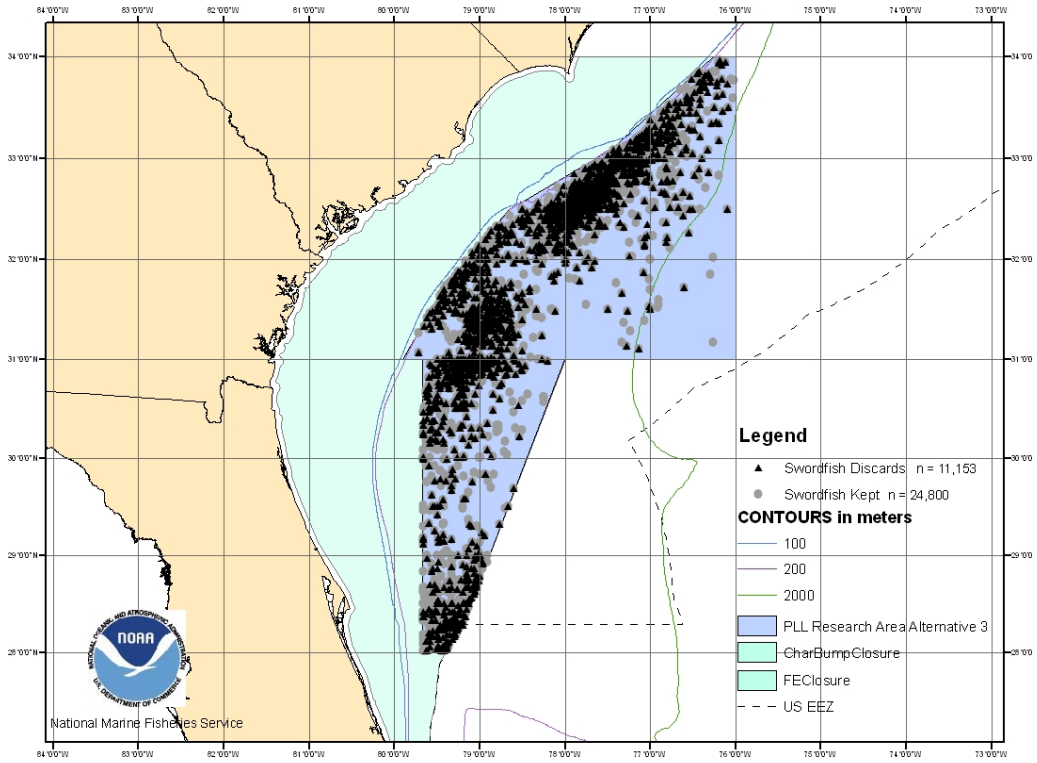


Figure 4.1 Swordfish kept and discarded in the Charleston Bump and EFC proposed research areas.
Source: PLL logbook data 1995-2000.

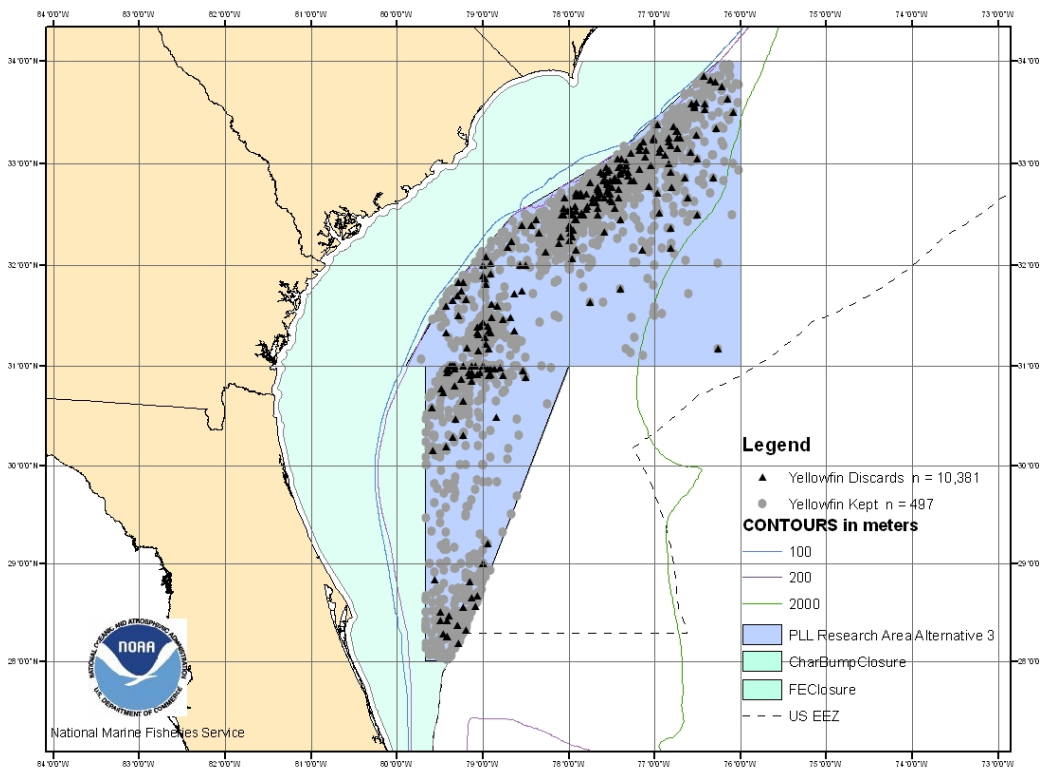


Figure 4.2 Yellowfin tuna kept and discarded in the Charleston Bump and EFC proposed research areas.
Source: PLL logbook data 1995-2000.

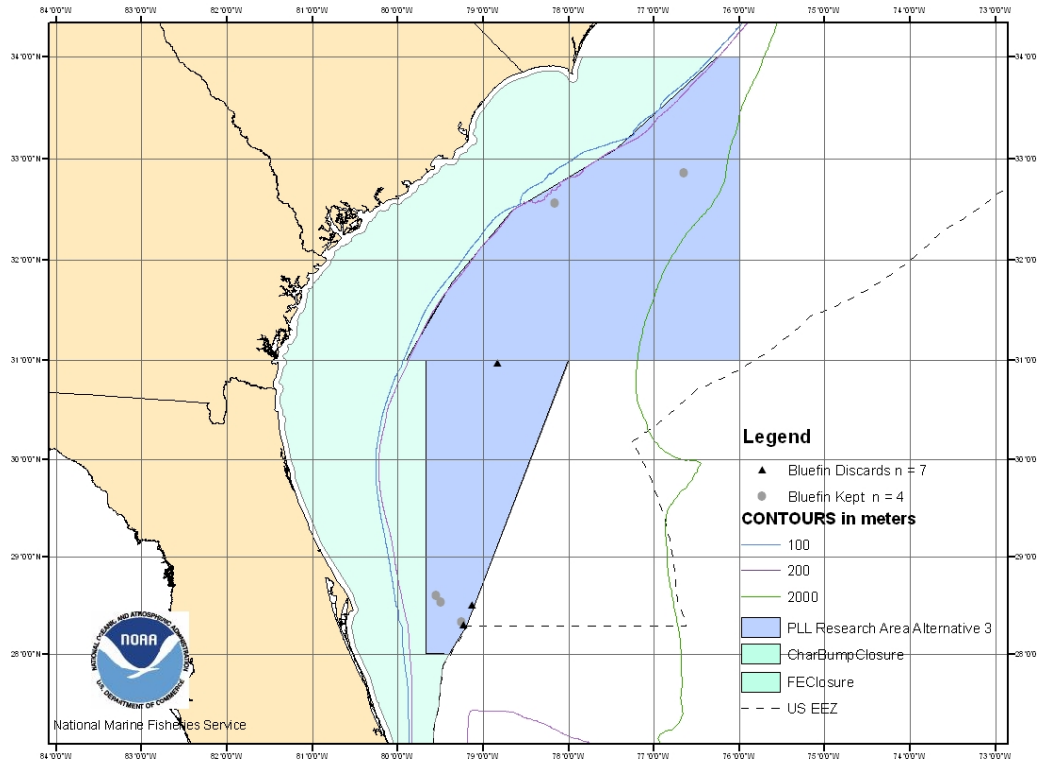


Figure 4.3 Bluefin tuna kept and discarded in the Charleston Bump and EFC proposed research areas.
 Source: PLL logbook data 1995-2000.

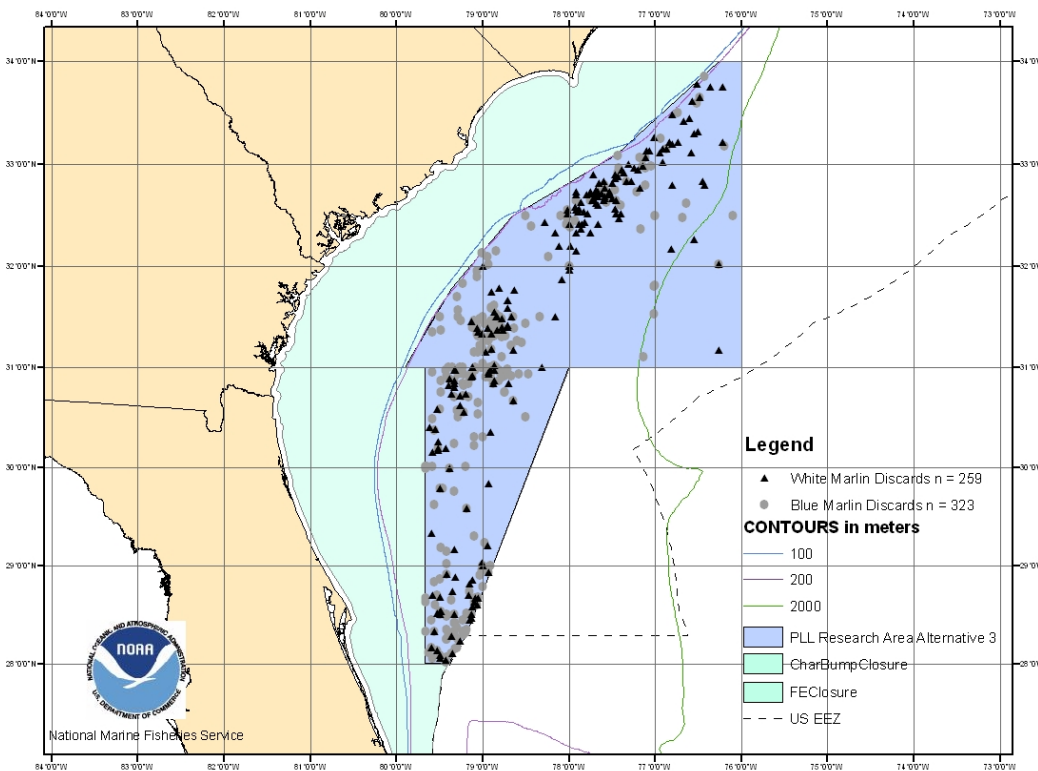


Figure 4.4 Blue and white marlin live and dead discards combined in the Charleston Bump and EFC proposed research areas.
 Source: PLL logbook data 1995-2000.

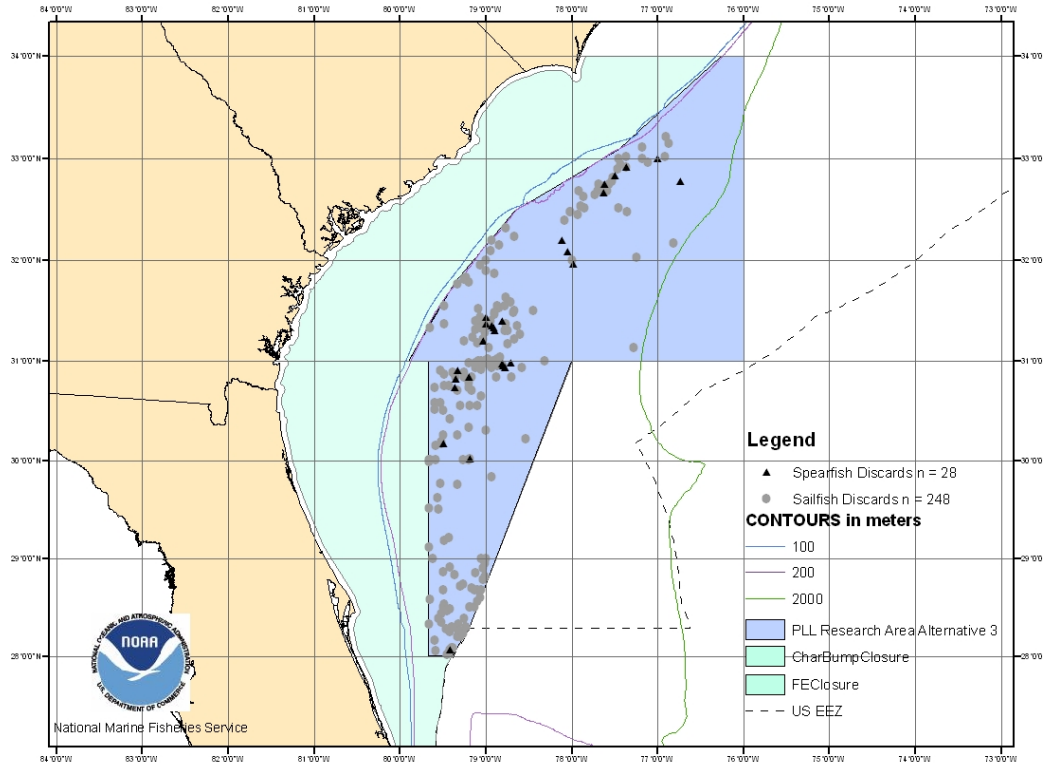


Figure 4.5 Spearfish and sailfish live and dead discards combined in the Charleston Bump and EFC proposed research areas. Source: PLL logbook data 1995-2000.

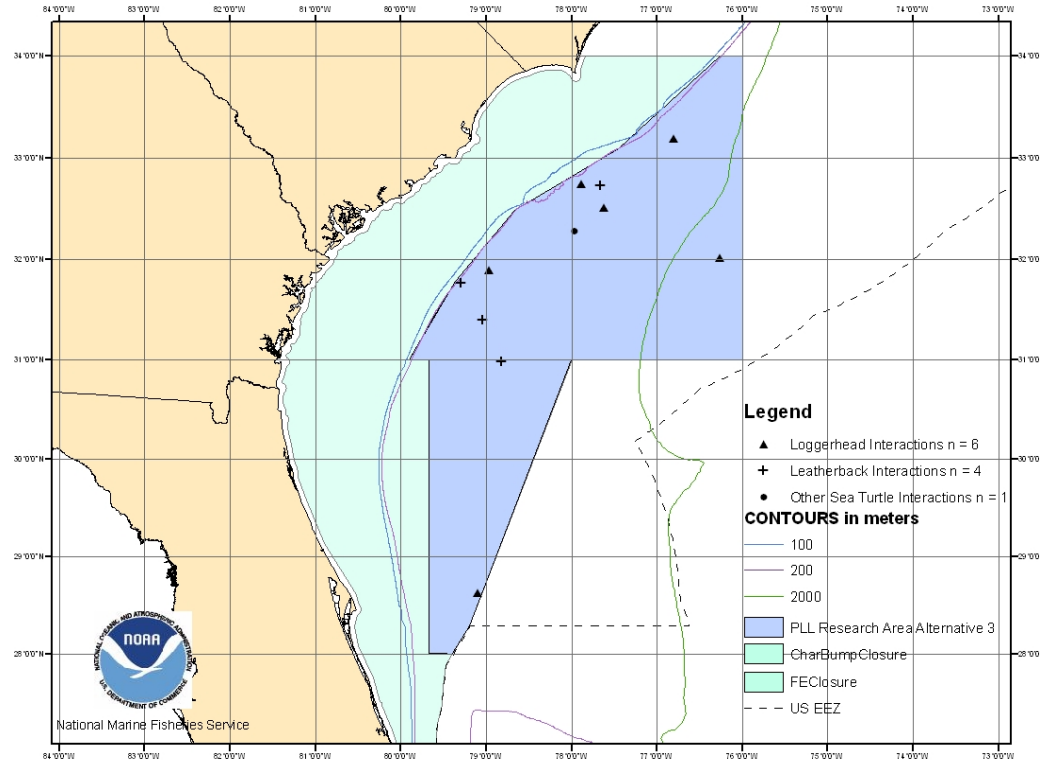


Figure 4.6 Sea turtle interactions in the Charleston Bump and EFC proposed research areas. Source: PLL logbook data 1995-2000.

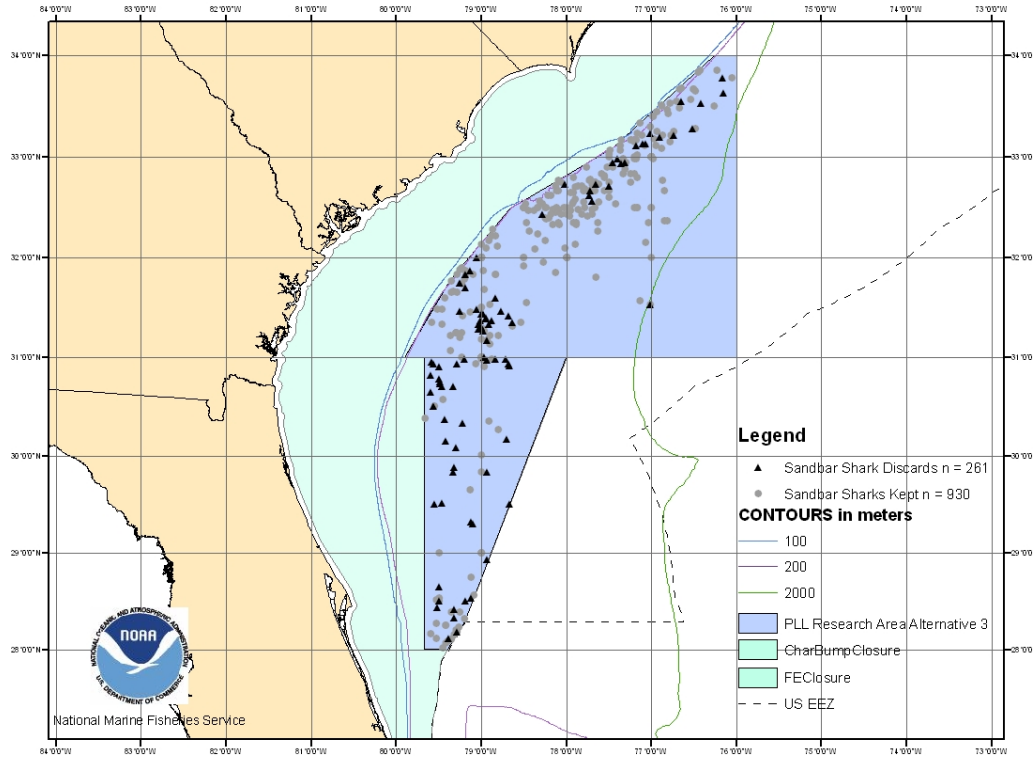


Figure 4.7 Sandbar sharks kept and discarded in the Charleston Bump and EFC proposed research areas. Source: PLL logbook data 1995-2000.

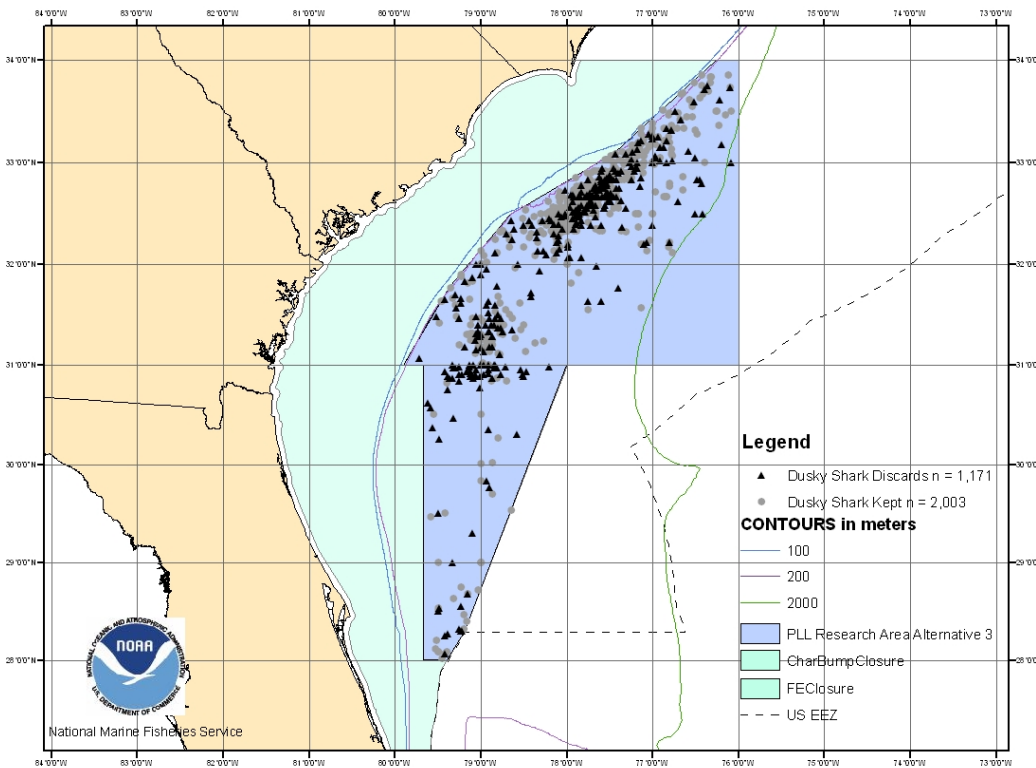


Figure 4.8 Dusky sharks kept and discarded in the Charleston Bump and EFC proposed research areas. Source: PLL logbook data 1995-2000.

Table 4.1 Table showing historic fishing effort (number of hooks/month) in the Charleston Bump and EFC research areas from 1995-2000 versus proposed fishing effort under Alternative 2.
Source: PLL logbook data 1995-2000.

Month	Average Hooks/Month 1995-2000	Hooks/Month in Research Fishery	Percent of Historic Effort
1	1047	5500	5.25
2	61055	11000	0.18
3	105060	11000	0.10
4	92326	11000	0.12
5	6204	5500	0.89
6	6460	5500	0.85
7	6297	5500	0.87
8	2471	5500	2.23
9	7433	5500	0.74
10	8215	5500	0.67
11	3830	5500	1.44
12	4034	5500	1.36
Total	304431	82500	0.27

Table 4.2 Table showing historic fishing effort in the Charleston Bump and EFC research areas from 1995-2000 versus proposed fishing effort under Alternative 3. Source: PLL logbook data 1995-2000.

Month	Average Hooks/Month 1995-2000	Hooks/Month in Proposed Research Fishery	Percent of Historic Effort
1	2133	5500	2.58
2	63101	11000	0.17
3	108195	11000	0.10
4	97533	11000	0.11
5	12660	5500	0.43
6	10194	5500	0.54
7	9628	5500	0.57
8	6506	5500	0.85
9	12913	5500	0.43
10	9486	5500	0.58
11	5836	5500	0.94
12	6456	5500	0.85
Total	344640	82500	0.24

Table 4.3 Summary table of potential annual catch of target and non-target species in the proposed research fishery resulting from Alternatives 2 and 3 based on PLL logbook data. The monthly breakdown of data and individual calculations for each alternative are provided in subsequent Tables 4.4 through 4.19. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: PLL logbook data 1995-2000.

Alternative	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
Alternative 2	1232	201	325	0.03	0.00	0.15	312	16	7	9	0.28	0.25
Alternative 3	1047	182	266	0.25	0.41	0.14	348	15	5	73	6	0.51
	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles	
Alternative 2	9	1	28	5	14	5	3	0.30	0.17	0.05	0.02	
Alternative 3	12	2	22	5	14	5	2	0.17	0.12	0.16	0.02	
	LCS Kept	LCS Discards Alive	LCS Discards Dead	Pelagics Kept	Pelagics Discards Alive	Pelagics Discards Dead	Sandbar Kept	Sandbar Discards Alive	Sandbar Discards Dead	Dusky Kept	Dusky Discards Alive	Dusky Discards Dead
Alternative 2	170	126	69	19	82	17	37	6	3	41	25	6
Alternative 3	113	124	50	21	81	11	58	8	3	47	20	6

Table 4.4 Summary table of potential annual catch of target and non-target species in the proposed research fishery resulting from Alternatives 2 and 3 based on POP data. The monthly breakdown of data and individual calculations for each alternative are provided in subsequent Tables 4.20 through 4. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: POP data 1995-2000.

Alternative	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
Alternative 2	1109	1049	408	0	0	0	487	43	13	5	4	0
Alternative 3	1083	973	360	0	0	0	359	45	18	44	4	6
	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles	
Alternative 2	17	9	2	2	25	14	0	0	2	4	1	
Alternative 3	9	13	10	14	20	11	0	0	2	6	1	
	LCS Kept	LCS Discards Alive	LCS Discards Dead	Pelagics Kept	Pelagics Discards Alive	Pelagics Discards Dead	Sandbar Kept	Sandbar Discards Alive	Sandbar Discards Dead	Dusky Kept	Dusky Discards Alive	Dusky Discards Dead
Alternative 2	128	230	265	14	73	145	0	0	1	19	12	5
Alternative 3	82	225	207	26	56	188	0	0	1	25	39	32

Table 4.5a-d Alternatives 2 and 3, Charleston Bump research area only, showing a) total number of swordfish and tunas kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted catch/discards in the research fishery. Source: PLL logbook data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
2	364016	4021	916	857	2	0	0	2297	89	34	6	0	0
3	623743	7771	1992	2178	0	0	0	3643	109	46	8	3	0
4	532441	5341	1078	1303	0	0	0	3263	100	26	10	3	0

b. Average monthly catch

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
2	60669.3	670.2	152.7	142.8	0.3	0	0	382.8	14.8	5.7	1.0	0	0
3	103957.2	1295.2	332.0	363.0	0	0	0	607.2	18.2	7.7	1.3	0.5	0
4	88740.2	890.2	179.7	217.2	0	0	0	543.8	16.7	4.3	1.7	0.5	0

c. Average monthly CPUE

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
2	60669.3	0.0110	0.0025	0.0024	0	0	0	0.0063	0.0002	0.0001	0	0	0
3	103957.2	0.0125	0.0032	0.0035	0	0	0	0.0058	0.0002	0.0001	0	0	0
4	88740.2	0.0100	0.0020	0.0024	0	0	0	0.0061	0.0002	0	0	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
2	5500	60.8	13.8	12.9	0	0	0	34.7	1.3	0.5	0.1	0	0
3	5500	68.5	17.6	19.2	0	0	0	32.1	1.0	0.4	0.1	0	0
4	5500	55.2	11.1	13.5	0	0	0	33.7	1.0	0.3	0.1	0	0
Total	16500	184.4	42.5	45.6	0	0	0	100.5	3.3	1.2	0.3	0.1	0

Table 4.6a-d Alternative 2 EFC proposed research area only showing a) total number of swordfish and tunas kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted catch/discards in the research fishery. Source: PLL logbook data 1995-2000.

a. Total number caught over six years (1995-2000)

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	6280	59	10	6	0	0	0	16	0	1	0	0	0
2	2315	10	0	2	0	0	0	1	0	0	1	0	0
3	6617	89	16	8	0	0	0	10	2	0	0	0	0
4	21515	195	41	66	0	0	0	72	2	0	2	0	0
5	37226	387	46	81	0	0	1	80	0	0	0	0	0
6	38763	524	43	84	0	0	0	166	1	0	1	0	0
7	37781	516	36	94	0	0	0	158	6	3	1	0	0
8	14824	350	42	130	0	0	0	46	3	2	3	0	0
9	44597	1136	137	400	0	0	0	130	7	3	3	0	2
10	49287	1259	200	342	0	0	0	192	10	0	21	2	0
11	22978	614	132	131	0	0	0	145	22	11	3	0	0
12	24201	371	95	182	0	0	0	93	4	1	5	0	0
Total	306384	5510	798	1526	0	0	1	1109	57	21	40	2	2

b. Average monthly catch

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	1047	9.83	1.67	1.00	0	0	0	2.67	0	0.17	0	0	0
2	386	1.67	0	0.33	0	0	0	0.17	0	0	0.17	0	0
3	1103	14.83	2.67	1.33	0	0	0	1.67	0.33	0	0	0	0
4	3586	32.50	6.83	11.00	0	0	0	12.00	0.33	0	0.33	0	0
5	6204	64.50	7.67	13.50	0	0	0.17	13.33	0	0	0	0	0
6	6461	87.33	7.17	14.00	0	0	0	27.67	0.17	0	0.17	0	0
7	6297	86.00	6.00	15.67	0	0	0	26.33	1.00	0.50	0.17	0	0
8	2471	58.33	7.00	21.67	0	0	0	7.67	0.50	0.33	0.50	0	0
9	7433	189.33	22.83	66.67	0	0	0	21.67	1.17	0.50	0.50	0	0.33
10	8215	209.83	33.33	57.00	0	0	0	32.00	1.67	0	3.50	0.33	0
11	3830	102.33	22.00	21.83	0	0	0	24.17	3.67	1.83	0.50	0	0
12	4034	61.83	15.83	30.33	0	0	0	15.50	0.67	0.17	0.83	0	0

c. Average monthly CPUE

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	1047	0.0094	0.0016	0.0010	0	0	0	0.0025	0	0.0002	0	0	0
2	386	0.0043	0.0000	0.0009	0	0	0	0.0004	0	0	0.0004	0	0
3	1103	0.0135	0.0024	0.0012	0	0	0	0.0015	0.0003	0	0.0000	0	0
4	3586	0.0091	0.0019	0.0031	0	0	0	0.0033	0.0001	0	0.0001	0	0
5	6204	0.0104	0.0012	0.0022	0	0	0	0.0021	0	0	0	0	0
6	6461	0.0135	0.0011	0.0022	0	0	0	0.0043	0	0	0	0	0
7	6297	0.0137	0.0010	0.0025	0	0	0	0.0042	0.0002	0.0001	0	0	0
8	2471	0.0236	0.0028	0.0088	0	0	0	0.0031	0.0002	0.0001	0.0002	0	0
9	7433	0.0255	0.0031	0.0090	0	0	0	0.0029	0.0002	0.0001	0.0001	0	0
10	8215	0.0255	0.0041	0.0069	0	0	0	0.0039	0.0002	0	0.0004	0	0
11	3830	0.0267	0.0057	0.0057	0	0	0	0.0063	0.0010	0.0005	0.0001	0	0
12	4034	0.0153	0.0039	0.0075	0	0	0	0.0038	0.0002	0	0.0002	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	5500	51.7	8.8	5.3	0	0	0	14.0	0	0.9	0	0	0
2	5500	23.8	0	4.8	0	0	0	2.4	0	0	2.4	0	0
3	5500	74.0	13.3	6.6	0	0	0	8.3	1.7	0	0	0	0
4	5500	49.8	10.5	16.9	0	0	0	18.4	0.5	0	0.5	0	0
5	5500	57.2	6.8	12.0	0	0	0.1	11.8	0	0	0	0	0
6	5500	74.3	6.1	11.9	0	0	0	23.6	0.1	0	0.1	0	0
7	5500	75.1	5.2	13.7	0	0	0	23.0	0.9	0.4	0.1	0	0
8	5500	129.9	15.6	48.2	0	0	0	17.1	1.1	0.7	1.1	0	0
9	5500	140.1	16.9	49.3	0	0	0	16.0	0.9	0.4	0.4	0	0.2
10	5500	140.5	22.3	38.2	0	0	0	21.4	1.1	0	2.3	0.2	0
11	5500	147.0	31.6	31.4	0	0	0	34.7	5.3	2.6	0.7	0	0
12	5500	84.3	21.6	41.4	0	0	0	21.1	0.9	0.2	1.1	0	0
Total	66000	1047.6	158.7	279.5	0	0	0.1	211.8	12.5	5.3	8.9	0.2	0.2

Table 4.7 Alternative 2 Charleston Bump and EFC proposed research areas combined showing the total number of swordfish and tunas predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.1d (Charleston Bump research area) and Table 4.2d (EFC research area under Alternative 2). Source: PLL logbook data 1995-2000.

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc
1	5500	51.7	8.8	5.3	0	0	0	14.0	0	0.9	0	0	0
2	11000	84.5	13.8	17.7	0	0	0	37.1	1.3	0.5	2.5	0	0
3	11000	142.5	30.9	25.9	0	0	0	40.4	2.6	0.4	0.1	0	0
4	11000	105.0	21.6	30.3	0	0	0	52.1	1.5	0.3	0.6	0	0
5	5500	57.2	6.8	12.0	0	0	0	11.8	0.0	0	0	0	0
6	5500	74.3	6.1	11.9	0	0	0	23.6	0.1	0	0.1	0	0
7	5500	75.1	5.2	13.7	0	0	0	23.0	0.9	0.4	0.1	0	0
8	5500	129.9	15.6	48.2	0	0	0	17.1	1.1	0.7	1.1	0	0
9	5500	140.1	16.9	49.3	0	0	0	16.0	0.9	0.4	0.4	0	0.2
10	5500	140.5	22.3	38.2	0	0	0	21.4	1.1	0	2.3	0.2	0
11	5500	147.0	31.6	31.4	0	0	0	34.7	5.3	2.6	0.7	0	0
12	5500	84.3	21.6	41.4	0	0	0	21.1	0.9	0.2	1.1	0	0
Total	82500	1232	201	325	0	0	0.1	312	16	7	9	0.3	0.2

Table 4.8a-d Alternative 3 EFC proposed research area only showing a) total number of swordfish and tunas kept and discarded from 1995-2000 in the East Florida Coast proposed research area; b) average monthly catch; c) average monthly CPUEs; and, d) predicted catch/discards in the research fishery. Source: PLL logbook data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	12795	101	26	29	0	0	0	49	4	1	9	2	0
2	14588	71	11	8	0	0	0	40	2	1	10	3	0
3	25427	266	35	42	0	0	0	43	2	0	31	3	0
4	52754	470	77	97	0	0	0	129	4	1	22	3	0
5	75960	599	75	112	3	2	2	133	2	0	10	0	0
6	61163	761	75	126	0	3	0	211	1	0	43	0	1
7	57766	730	71	168	0	0	0	216	6	4	89	1	0
8	39034	664	87	179	0	0	0	194	3	3	126	3	2
9	77477	1480	170	439	0	0	0	553	19	5	100	4	2
10	56917	1378	218	373	0	0	0	220	10	0	33	2	0
11	35018	680	163	163	0	0	0	196	23	11	75	9	0
12	38738	467	130	228	0	0	0	144	8	1	25	5	0
Total	547637	7667	1138	1964	3	5	2	2128	84	27	573	35	5

b. Average monthly catch

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	2133	16.83	4.33	4.83	0	0	0	8.17	0.67	0.17	1.50	0.33	0
2	2431	11.83	1.83	1.33	0	0	0	6.67	0.33	0.17	1.67	0.50	0
3	4238	44.33	5.83	7.00	0	0	0	7.17	0.33	0	5.17	0.50	0
4	8792	78.33	12.83	16.17	0	0	0	21.50	0.67	0.17	3.67	0.50	0
5	12660	99.83	12.50	18.67	0.50	0.33	0.33	22.17	0.33	0	1.67	0	0
6	10194	126.83	12.50	21.00	0.00	0.50	0.00	35.17	0.17	0.00	7.17	0	0.17
7	9628	121.67	11.83	28.00	0	0	0	36.00	1.00	0.67	14.83	0.17	0.00
8	6506	110.67	14.50	29.83	0	0	0	32.33	0.50	0.50	21.00	0.50	0.33
9	12913	246.67	28.33	73.17	0	0	0	92.17	3.17	0.83	16.67	0.67	0.33
10	9486	229.67	36.33	62.17	0	0	0	36.67	1.67	0	5.50	0.33	0
11	5836	113.33	27.17	27.17	0	0	0	32.67	3.83	1.83	12.50	1.50	0
12	6456	77.83	21.67	38.00	0	0	0	24.00	1.33	0.17	4.17	0.83	0

c. Average monthly CPUE

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	2133	0.0079	0.0020	0.0023	0	0	0	0.0038	0.0003	0.0001	0.0007	0.0002	0
2	2431	0.0049	0.0008	0.0005	0	0	0	0.0027	0.0001	0.0001	0.0007	0.0002	0
3	4238	0.0105	0.0014	0.0017	0	0	0	0.0017	0.0001	0	0.0012	0.0001	0
4	8792	0.0089	0.0015	0.0018	0	0	0	0.0024	0.0001	0	0.0004	0.0001	0
5	12660	0.0079	0.0010	0.0015	0	0	0	0.0018	0	0	0.0001	0	0
6	10194	0.0124	0.0012	0.0021	0	0	0	0.0034	0	0	0.0007	0	0
7	9628	0.0126	0.0012	0.0029	0	0	0	0.0037	0.0001	0.0001	0.0015	0	0
8	6506	0.0170	0.0022	0.0046	0	0	0	0.0050	0.0001	0.0001	0.0032	0.0001	0.0001
9	12913	0.0191	0.0022	0.0057	0	0	0	0.0071	0.0002	0.0001	0.0013	0.0001	0
10	9486	0.0242	0.0038	0.0066	0	0	0	0.0039	0.0002	0	0.0006	0	0
11	5836	0.0194	0.0047	0.0047	0	0	0	0.0056	0.0007	0.0003	0.0021	0.0003	0
12	6456	0.0121	0.0034	0.0059	0	0	0	0.0037	0.0002	0	0.0006	0.0001	0

d. Predicted monthly catch/discards with 11 sets @ 500 hooks/set

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	5500	43.4	11.2	12.5	0	0	0	21.1	1.7	0.4	3.9	0.9	0
2	5500	26.8	4.1	3.0	0	0	0	15.1	0.8	0.4	3.8	1.1	0
3	5500	57.5	7.6	9.1	0	0	0	9.3	0.4	0	6.7	0.6	0
4	5500	49.0	8.0	10.1	0	0	0	13.4	0.4	0.1	2.3	0.3	0
5	5500	43.4	5.4	8.1	0.2	0.1	0.1	9.6	0.1	0	0.7	0	0
6	5500	68.4	6.7	11.3	0	0.3	0	19.0	0.1	0	3.9	0	0.1
7	5500	69.5	6.8	16.0	0	0	0	20.6	0.6	0.4	8.5	0.1	0
8	5500	93.6	12.3	25.2	0	0	0	27.3	0.4	0.4	17.8	0.4	0.3
9	5500	105.1	12.1	31.2	0	0	0	39.3	1.3	0.4	7.1	0.3	0.1
10	5500	133.2	21.1	36.0	0	0	0	21.3	1.0	0	3.2	0.2	0
11	5500	106.8	25.6	25.6	0	0	0	30.8	3.6	1.7	11.8	1.4	0
12	5500	66.3	18.5	32.4	0	0	0	20.4	1.1	0.1	3.5	0.7	0
Total	66000	862.9	139.3	220.5	0.2	0.4	0.1	247.1	11.6	3.9	73.1	6.1	0.5

Table 4.9 Alternative 3 Charleston Bump and EFC proposed research areas combined showing the total number of swordfish and tunas predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.1d (Charleston Bump research area) and Table 4.4d (EFC research area under Alternative 3). Source: PLL logbook data 1995-2000.

Month	Hooks	Swordfish Kept	Swordfish Discards Alive	Swordfish Discards Dead	Bluefin Kept	Bluefin Discards Alive	Bluefin Discards Dead	Yellowfin Kept	Yellowfin Discards Alive	Yellowfin Discards Dead	Bigeye Kept	Bigeye Discards Alive	Bigeye Discards Dead
1	5500	43.4	11.2	12.5	0	0	0	21.1	1.7	0.4	3.9	0.9	0
2	11000	87.5	18.0	16.0	0	0	0	49.8	2.1	0.9	3.9	1.1	0
3	11000	126.1	25.1	28.3	0	0	0	41.4	1.4	0.4	6.8	0.7	0
4	11000	104.2	19.2	23.6	0	0	0	47.2	1.5	0.4	2.4	0.3	0
5	5500	43.4	5.4	8.1	0.2	0.1	0.1	9.6	0.1	0	0.7	0.0	0
6	5500	68.4	6.7	11.3	0	0.3	0	19.0	0.1	0	3.9	0.0	0.1
7	5500	69.5	6.8	16.0	0	0	0	20.6	0.6	0.4	8.5	0.1	0
8	5500	93.6	12.3	25.2	0	0	0	27.3	0.4	0.4	17.8	0.4	0.3
9	5500	105.1	12.1	31.2	0	0	0	39.3	1.3	0.4	7.1	0.3	0.1
10	5500	133.2	21.1	36.0	0	0	0	21.3	1.0	0	3.2	0.2	0
11	5500	106.8	25.6	25.6	0	0	0	30.8	3.6	1.7	11.8	1.4	0
12	5500	66.3	18.5	32.4	0	0	0	20.4	1.1	0.1	3.5	0.7	0
Total	82500	1047	182	266	0.2	0.4	0.1	348	15	5	73	6	0.5

Table 4.10a-d Alternatives 2 and 3 for Charleston Bump proposed research area showing a) total number of billfish and sea turtles discarded from 1995-2000 in the Charleston Bump proposed research area; b) average monthly catch; c) average monthly CPUEs; and, d) predicted discards in the research fishery. Source: PLL logbook data 1995-2000.

a. Total number discarded over six years (1995-2000)

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
2	364016	22	2	22	4	9	0	2	0	0	1	1
3	623743	46	12	25	2	27	2	2	1	2	2	0
4	532441	71	23	73	13	44	12	9	2	1	2	0
Total	1520200	139	37	120	19	80	14	13	3	3	5	1

b. Average monthly discards

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
2	60669.3	3.7	0.3	3.7	0.7	1.5	0.0	0.3	0.0	0.0	0.2	0.2
3	103957.2	7.7	2.0	4.2	0.3	4.5	0.3	0.3	0.2	0.3	0.3	0.0
4	88740.2	11.8	3.8	12.2	2.2	7.3	2.0	1.5	0.3	0.2	0.3	0.0

c. Average monthly CPUE

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
2	60669.3	0.0001	0	0.0001	0	0	0	0	0	0	0	0
3	103957.2	0.0001	0	0	0	0	0	0	0	0	0	0
4	88740.2	0.0001	0	0.0001	0	0.0001	0	0	0	0	0	0

d. Predicted monthly discards with 11 sets @ 500 hooks/set

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
2	5500	0.3	0.0	0.3	0.1	0.1	0	0	0	0	0	0
3	5500	0.4	0.1	0.2	0	0.2	0	0	0	0	0	0
4	5500	0.7	0.2	0.8	0.1	0.5	0.1	0.1	0	0	0	0
Total	16500	1.5	0.4	1.3	0.2	0.8	0.1	0.1	0	0	0.1	0

Table 4.11a-d Alternative 2 EFC proposed research area only showing a) total number of billfish and sea turtles discarded from 1995-2000 in the EFC proposed research area; b) average monthly catch; c) average monthly CPUEs; and, d) predicted discards in the research fishery. Source: PLL logbook data 1995-2000.

a. Total number discarded over six years (1995-2000)

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
1	6280	0	0	1	1	1	0	1	0	0	0	0
2	2315	0	0	3	1	0	0	0	0	0	0	0
3	6617	0	0	4	0	0	0	0	0	0	0	0
4	21515	5	4	5	0	3	4	0	0	0	0	0
5	37226	5	0	7	3	11	4	1	1	0	0	0
6	38763	6	0	11	1	8	2	1	0	0	0	0
7	37781	4	0	12	1	14	4	1	0	1	0	0
8	14824	0	0	7	1	12	4	3	0	0	0	0
9	44597	2	0	21	3	14	4	3	1	0	0	0
10	49287	1	0	17	1	3	1	1	0	0	0	0
11	22978	11	0	7	1	1	0	0	0	0	0	0
12	24201	4	0	3	0	0	2	0	0	0	0	0
Total	306384	38	4	98	13	67	25	11	2	1	0	0

b. Average monthly catch

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
1	1046.7	0	0	0.2	0.2	0.2	0	0.2	0	0	0	0
2	385.8	0	0	0.5	0.2	0	0	0	0	0	0	0
3	1102.8	0	0	0.7	0	0	0	0	0	0	0	0
4	3585.8	0.8	0.7	0.8	0	0.5	0.7	0	0	0	0	0
5	6204.3	0.8	0	1.2	0.5	1.8	0.7	0.2	0.2	0	0	0
6	6460.5	1.0	0	1.8	0.2	1.3	0.3	0.2	0	0	0	0
7	6296.8	0.7	0	2.0	0.2	2.3	0.7	0.2	0	0.2	0	0
8	2470.7	0	0	1.2	0.2	2.0	0.7	0.5	0	0	0	0
9	7432.8	0.3	0	3.5	0.5	2.3	0.7	0.5	0.2	0	0	0
10	8214.5	0.2	0	2.8	0.2	0.5	0.2	0.2	0	0	0	0
11	3829.7	1.8	0	1.2	0.2	0.2	0	0	0	0	0	0
12	4033.5	0.7	0	0.5	0	0	0.3	0	0	0	0	0

c. Average monthly CPUE

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
1	1046.7	0	0	0.0002	0.0002	0.0002	0.0000	0.0002	0	0	0	0
2	385.8	0	0	0.0013	0.0004	0	0	0	0	0	0	0
3	1102.8	0	0	0.0006	0	0	0	0	0	0	0	0
4	3585.8	0.0002	0.0002	0.0002	0	0.0001	0.0002	0	0	0	0	0
5	6204.3	0.0001	0	0.0002	0.0001	0.0003	0.0001	0	0	0	0	0
6	6460.5	0.0002	0	0.0003	0	0.0002	0.0001	0	0	0	0	0
7	6296.8	0.0001	0	0.0003	0	0.0004	0.0001	0	0	0	0	0
8	2470.7	0	0	0.0005	0.0001	0.0008	0.0003	0.0002	0	0	0	0
9	7432.8	0	0	0.0005	0.0001	0.0003	0.0001	0.0001	0	0	0	0
10	8214.5	0	0	0.0003	0	0.0001	0	0	0	0	0	0
11	3829.7	0.0005	0	0.0003	0	0	0	0	0	0	0	0
12	4033.5	0.0002	0	0.0001	0	0	0.0001	0	0	0	0	0

d. Predicted monthly discards with 11 sets @ 500 hooks/set

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea Turtles
1	5500	0	0	0.9	0.9	0.9	0	0.9	0	0	0	0
2	5500	0	0	7.1	2.4	0	0	0	0	0	0	0
3	5500	0	0	3.3	0	0	0	0	0	0	0	0
4	5500	1.3	1.0	1.3	0	0.8	1.0	0	0	0	0	0
5	5500	0.7	0	1.0	0.4	1.6	0.6	0.1	0.1	0	0	0
6	5500	0.9	0	1.6	0.1	1.1	0.3	0.1	0	0	0	0
7	5500	0.6	0	1.7	0.1	2.0	0.6	0.1	0	0.1	0	0
8	5500	0.0	0	2.6	0.4	4.5	1.5	1.1	0	0	0	0
9	5500	0.2	0	2.6	0.4	1.7	0.5	0.4	0.1	0	0	0
10	5500	0.1	0	1.9	0.1	0.3	0.1	0.1	0	0	0	0
11	5500	2.6	0	1.7	0.2	0.2	0	0	0	0	0	0
12	5500	0.9	0	0.7	0	0	0.5	0	0	0	0	0
Total	66000	7.4	1.0	26.4	5.1	13.2	5.0	2.9	0.3	0.1	0	0

Table 4.12 Alternative 2 Charleston Bump and EFC proposed research areas combined showing the total number of billfish and sea turtles predicted to be discarded in the research fishery. Numbers derived by summing Tables 4.6d (Charleston Bump research area) and Table 4.7d (EFC research area under Alternative 2). Source: PLL logbook data 1995-2000.

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	5500	0	0	0.9	0.9	0.9	0	0.9	0	0	0	0
2	11000	0.3	0	7.5	2.4	0.1	0	0	0	0	0	0
3	11000	0.4	0.1	3.5	0	0.2	0	0	0	0	0	0
4	11000	2.0	1.3	2.0	0.1	1.2	1.1	0.1	0	0	0	0
5	5500	0.7	0	1.0	0.4	1.6	0.6	0.1	0.1	0	0	0
6	5500	0.9	0	1.6	0.1	1.1	0.3	0.1	0	0	0	0
7	5500	0.6	0	1.7	0.1	2.0	0.6	0.1	0	0.1	0	0
8	5500	0.0	0	2.6	0.4	4.5	1.5	1.1	0	0	0	0
9	5500	0.2	0	2.6	0.4	1.7	0.5	0.4	0.1	0	0	0
10	5500	0.1	0	1.9	0.1	0.3	0.1	0.1	0	0	0	0
11	5500	2.6	0	1.7	0.2	0.2	0	0	0	0	0	0
12	5500	0.9	0	0.7	0	0	0.5	0	0	0	0	0
Total	82500	9	1	28	5	14	5	3	0.3	0.2	0.1	0.0

Table 4.13a-d Alternative 3 EFC proposed research area only showing a) total number of billfish and sea turtles discarded from 1995-2000 in the East Florida Coast proposed research area; b) average monthly catch; c) average monthly CPUEs; and, d) predicted discards in the research fishery. Source: PLL logbook data 1995-2000.

a. Total number discarded over six years (1995-2000)

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	12795	0	0	2	2	1	0	1	0	0	0	0
2	14588	4	0	5	1	1	0	0	0	0	0	0
3	25427	3	1	12	1	0	1	0	0	0	0	0
4	52754	20	10	13	1	10	9	1	1	0	1	0
5	75960	15	7	20	22	24	9	1	1	0	0	0
6	61163	8	1	13	2	16	3	1	0	0	0	0
7	57766	6	0	19	1	20	5	1	0	1	0	0
8	39034	2	0	16	2	26	8	3	0	0	0	0
9	77477	3	0	34	3	24	6	3	1	0	0	0
10	56917	1	0	17	1	3	1	1	0	0	0	0
11	35018	11	0	11	2	2	1	0	0	0	0	0
12	38738	9	0	12	1	3	2	0	0	0	0	0
Total	547637	82	19	174	39	130	45	12	2	1	1	0

b. Average monthly catch

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	2132.5	0.0	0	0.3	0.3	0.2	0	0.2	0	0	0	0
2	2431.3	0.7	0	0.8	0.2	0.2	0	0	0	0	0	0
3	4237.8	0.5	0.2	2.0	0.2	0	0.2	0	0	0	0	0
4	8792.3	3.3	1.7	2.2	0.2	1.7	1.5	0.2	0	0	0.2	0
5	12660.0	2.5	1.2	3.3	3.7	4.0	1.5	0.2	0.2	0	0	0
6	10193.8	1.3	0.2	2.2	0.3	2.7	0.5	0.2	0	0	0	0
7	9627.7	1.0	0	3.2	0.2	3.3	0.8	0.2	0	0.2	0	0
8	6505.7	0.3	0	2.7	0.3	4.3	1.3	0.5	0	0	0	0
9	12912.8	0.5	0	5.7	0.5	4.0	1.0	0.5	0.2	0	0	0
10	9486.2	0.2	0	2.8	0.2	0.5	0.2	0.2	0	0	0	0
11	5836.3	1.8	0	1.8	0.3	0.3	0.2	0	0	0	0	0
12	6456.3	1.5	0	2.0	0.2	0.5	0.3	0	0	0	0	0

c. Average monthly CPUE

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	2132.5	0	0	0.0002	0.0002	0.0001	0	0.0001	0	0	0	0
2	2431.3	0.0003	0	0.0003	0.0001	0.0001	0	0	0	0	0	0
3	4237.8	0.0001	0	0.0005	0	0	0	0	0	0	0	0
4	8792.3	0.0004	0.0002	0.0002	0	0.0002	0.0002	0	0	0	0	0
5	12660.0	0.0002	0.0001	0.0003	0.0003	0.0003	0.0001	0	0	0	0	0
6	10193.8	0.0001	0	0.0002	0	0.0003	0	0	0	0	0	0
7	9627.7	0.0001	0	0.0003	0	0.0003	0.0001	0	0	0	0	0
8	6505.7	0.0001	0	0.0004	0.0001	0.0007	0.0002	0.0001	0	0	0	0
9	12912.8	0	0	0.0004	0	0.0003	0.0001	0	0	0	0	0
10	9486.2	0	0	0.0003	0	0.0001	0	0	0	0	0	0
11	5836.3	0.0003	0	0.0003	0.0001	0.0001	0	0	0	0	0	0
12	6456.3	0.0002	0	0.0003	0	0.0001	0.0001	0	0	0	0	0

d. Predicted monthly discards with 11 sets @ 500 hooks/set

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	5500	0	0	0.9	0.9	0.4	0	0.4	0	0	0	0
2	5500	1.5	0	1.9	0.4	0.4	0	0	0	0	0	0
3	5500	0.6	0.2	2.6	0.2	0	0.2	0	0	0	0	0
4	5500	2.1	1.0	1.4	0.1	1.0	0.9	0.1	0	0	0.1	0
5	5500	1.1	0.5	1.4	1.6	1.7	0.7	0.1	0.1	0	0	0
6	5500	0.7	0.1	1.2	0.2	1.4	0.3	0.1	0	0	0	0
7	5500	0.6	0	1.8	0.1	1.9	0.5	0.1	0	0.1	0	0
8	5500	0.3	0	2.3	0.3	3.7	1.1	0.4	0	0	0	0
9	5500	0.2	0	2.4	0.2	1.7	0.4	0.2	0.1	0	0	0
10	5500	0.1	0	1.6	0.1	0.3	0.1	0.1	0	0	0	0
11	5500	1.7	0	1.7	0.3	0.3	0.2	0	0	0	0	0
12	5500	1.3	0	1.7	0.1	0.4	0.3	0	0	0	0	0
Total	66000	10.2	1.9	20.9	4.5	13.3	4.6	1.5	0.1	0.1	0.1	0

Table 4.14 Alternative 3 Charleston Bump and EFC proposed research areas combined showing the total number of billfish and sea turtles predicted to be discarded in the research fishery. Numbers derived by summing Tables 4.6d (Charleston Bump research area) and Table 4.9d (EFC research area under Alternative 3). Source: PLL logbook data 1995-2000.

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	5500	0	0	0.9	0.9	0.4	0	0.4	0	0	0	0
2	11000	1.8	0	2.2	0.4	0.5	0	0	0	0	0	0
3	11000	1.1	0.3	2.8	0.2	0.2	0.2	0	0	0	0	0
4	11000	2.8	1.3	2.1	0.2	1.5	1.1	0.2	0	0	0.1	0
5	5500	1.1	0.5	1.4	1.6	1.7	0.7	0.1	0.1	0	0	0
6	5500	0.7	0.1	1.2	0.2	1.4	0.3	0.1	0	0	0	0
7	5500	0.6	0	1.8	0.1	1.9	0.5	0.1	0	0.1	0	0
8	5500	0.3	0	2.3	0.3	3.7	1.1	0.4	0	0	0	0
9	5500	0.2	0	2.4	0.2	1.7	0.4	0.2	0.1	0	0	0
10	5500	0.1	0	1.6	0.1	0.3	0.1	0.1	0	0	0	0
11	5500	1.7	0	1.7	0.3	0.3	0.2	0	0	0	0	0
12	5500	1.3	0	1.7	0.1	0.4	0.3	0	0	0	0	0
Total	82500	12	2	22	5	14	5	2	0.2	0.1	0.2	0.0

Table 4.15a-d Alternatives 2 and 3 for the Charleston Bump proposed research area showing a) total number of sharks kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted kept/discarded sharks in the research fishery. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: PLL logbook data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	364016	352	130	42	147	911	50	759	22	28	834	203	73
3	623743	936	298	137	226	971	153	825	14	7	1280	232	242
4	532441	433	713	331	109	674	98	378	83	23	322	311	65
Total	1520200	1721	1141	510	482	2556	301	1962	119	58	2436	746	380

b. Average monthly catch

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	60669.3	58.7	21.7	7.0	24.5	151.8	8.3	126.5	3.7	4.7	139.0	33.8	12.2
3	103957.2	156.0	49.7	22.8	37.7	161.8	25.5	137.5	2.3	1.2	213.3	38.7	40.3
4	88740.2	72.2	118.8	55.2	18.2	112.3	16.3	63.0	13.8	3.8	53.7	51.8	10.8

c. Average monthly CPUE

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	60669.3	0.0010	0.0004	0.0001	0.0004	0.0025	0.0001	0.0021	0.0001	0.0001	0.0023	0.0006	0.0002
3	103957.2	0.0015	0.0005	0.0002	0.0004	0.0016	0.0002	0.0013	0.0000	0.0000	0.0021	0.0004	0.0004
4	88740.2	0.0008	0.0013	0.0006	0.0002	0.0013	0.0002	0.0007	0.0002	0.0000	0.0006	0.0006	0.0001

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	5500	5.3	2.0	0.6	2.2	13.8	0.8	11.5	0.3	0.4	12.6	3.1	1.1
3	5500	8.3	2.6	1.2	2.0	8.6	1.3	7.3	0.1	0.1	11.3	2.0	2.1
4	5500	4.5	7.4	3.4	1.1	7.0	1.0	3.9	0.9	0.2	3.3	3.2	0.7
Total	16500	18.0	12.0	5.3	5.3	29.3	3.1	22.6	1.3	0.7	27.2	8.3	3.9

Table 4.16a-d Alternative 2 EFC research area showing a) total number of sharks kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted kept/discards in the research fishery. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: PLL logbook data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	6280	0	4	0	2	10	0	0	0	0	10	2	0
2	2315	20	1	0	0	0	0	0	0	0	0	1	0
3	6617	39	7	1	0	7	10	2	0	0	2	0	0
4	21515	128	49	17	3	16	0	6	3	0	8	2	0
5	37226	21	55	36	9	41	7	0	2	8	2	5	1
6	38763	20	73	54	4	26	6	5	15	1	0	21	1
7	37781	184	24	10	6	10	4	66	3	0	5	1	2
8	14824	7	41	46	4	3	1	1	0	0	1	0	0
9	44597	29	121	115	12	16	4	2	1	1	2	13	7
10	49287	4	99	45	9	39	2	0	10	5	0	25	2
11	22978	0	85	30	3	32	6	0	1	0	0	12	0
12	24201	0	26	2	17	34	2	0	0	0	0	2	0
Total	306384	452	585	356	69	234	42	82	35	15	30	84	13

b. Average monthly catch

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	1046.7	0	0.7	0	0.3	1.7	0	0	0	0	1.7	0.3	0
2	385.8	3.3	0.2	0	0	0	0	0	0	0	0	0.2	0
3	1102.8	6.5	1.2	0.2	0	1.2	1.7	0.3	0	0	0.3	0	0
4	3585.8	21.3	8.2	2.8	0.5	2.7	0.0	1.0	0.5	0	1.3	0.3	0
5	6204.3	3.5	9.2	6.0	1.5	6.8	1.2	0	0.3	1.3	0.3	0.8	0.2
6	6460.5	3.3	12.2	9.0	0.7	4.3	1.0	0.8	2.5	0.2	0.0	3.5	0.2
7	6296.8	30.7	4.0	1.7	1.0	1.7	0.7	11.0	0.5	0	0.8	0.2	0.3
8	2470.7	1.2	6.8	7.7	0.7	0.5	0.2	0.2	0.0	0	0.2	0	0
9	7432.8	4.8	20.2	19.2	2.0	2.7	0.7	0.3	0.2	0.2	0.3	2.2	1.2
10	8214.5	0.7	16.5	7.5	1.5	6.5	0.3	0	1.7	0.8	0	4.2	0.3
11	3829.7	0	14.2	5.0	0.5	5.3	1.0	0	0.2	0	0	2.0	0
12	4033.5	0	4.3	0.3	2.8	5.7	0.3	0	0	0	0	0.3	0

c. Average monthly CPUE

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	1046.7	0	0.0006	0	0.0003	0.0016	0	0	0	0	0.0016	0.0003	0
2	385.8	0.0086	0.0004	0	0	0	0	0	0	0	0	0.0004	0
3	1102.8	0.0059	0.0011	0.0002	0	0.0011	0.0015	0.0003	0	0	0.0003	0	0
4	3585.8	0.0059	0.0023	0.0008	0.0001	0.0007	0	0.0003	0.0001	0	0.0004	0.0001	0
5	6204.3	0.0006	0.0015	0.0010	0.0002	0.0011	0.0002	0	0.0001	0.0002	0.0001	0.0001	0
6	6460.5	0.0005	0.0019	0.0014	0.0001	0.0007	0.0002	0.0001	0.0004	0	0	0.0005	0
7	6296.8	0.0049	0.0006	0.0003	0.0002	0.0003	0.0001	0.0017	0.0001	0	0.0001	0	0.0001
8	2470.7	0.0005	0.0028	0.0031	0.0003	0.0002	0.0001	0.0001	0	0	0.0001	0	0
9	7432.8	0.0007	0.0027	0.0026	0.0003	0.0004	0.0001	0	0	0	0	0.0003	0.0002
10	8214.5	0.0001	0.0020	0.0009	0.0002	0.0008	0	0	0.0002	0.0001	0	0.0005	0
11	3829.7	0	0.0037	0.0013	0.0001	0.0014	0.0003	0	0	0	0	0.0005	0
12	4033.5	0	0.0011	0.0001	0.0007	0.0014	0.0001	0	0	0	0	0.0001	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	0	3.5	0	1.8	8.8	0	0	0	0	8.8	1.8	0
2	5500	47.5	2.4	0	0	0	0	0	0	0	0	2.4	0
3	5500	32.4	5.8	0.8	0	5.8	8.3	1.7	0	0	1.7	0	0
4	5500	32.7	12.5	4.3	0.8	4.1	0.0	1.5	0.8	0	2.0	0.5	0
5	5500	3.1	8.1	5.3	1.3	6.1	1.0	0	0.3	1.2	0.3	0.7	0.1
6	5500	2.8	10.4	7.7	0.6	3.7	0.9	0.7	2.1	0.1	0.0	3.0	0.1
7	5500	26.8	3.5	1.5	0.9	1.5	0.6	9.6	0.4	0	0.7	0.1	0.3
8	5500	2.6	15.2	17.1	1.5	1.1	0.4	0.4	0.0	0	0.4	0	0
9	5500	3.6	14.9	14.2	1.5	2.0	0.5	0.2	0.1	0.1	0.2	1.6	0.9
10	5500	0.4	11.0	5.0	1.0	4.4	0.2	0	1.1	0.6	0.0	2.8	0.2
11	5500	0	20.3	7.2	0.7	7.7	1.4	0	0.2	0	0	2.9	0
12	5500	0	5.9	0.5	3.9	7.7	0.5	0	0.0	0	0	0.5	0
Total	66000	152.0	113.6	63.5	13.8	52.7	13.8	14.1	5.1	2.0	14.1	16.2	1.7

Table 4.17 Alternative 2 Charleston Bump and EFC proposed research areas combined showing the total number of sharks predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.11d (Charleston Bump research area) and Table 4.12d (EFC research area under Alternative 2). LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: PLL logbook data 1995-2000.

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	0	3.5	0	1.8	8.8	0	0	0	0	8.8	1.8	0
2	11000	52.8	4.3	0.6	2.2	13.8	0.8	11.5	0.3	0.4	12.6	5.4	1.1
3	11000	40.7	8.4	2.0	2.0	14.4	9.7	8.9	0.1	0.1	12.9	2.0	2.1
4	11000	37.2	19.9	7.8	1.9	11.1	1.0	5.4	1.6	0.2	5.4	3.7	0.7
5	5500	3.1	8.1	5.3	1.3	6.1	1.0	0.0	0.3	1.2	0.3	0.7	0.1
6	5500	2.8	10.4	7.7	0.6	3.7	0.9	0.7	2.1	0.1	0	3.0	0.1
7	5500	26.8	3.5	1.5	0.9	1.5	0.6	9.6	0.4	0	0.7	0.1	0.3
8	5500	2.6	15.2	17.1	1.5	1.1	0.4	0.4	0	0	0.4	0.0	0
9	5500	3.6	14.9	14.2	1.5	2.0	0.5	0.2	0.1	0.1	0.2	1.6	0.9
10	5500	0.4	11.0	5.0	1.0	4.4	0.2	0	1.1	0.6	0	2.8	0.2
11	5500	0	20.3	7.2	0.7	7.7	1.4	0	0.2	0	0	2.9	0
12	5500	0	5.9	0.5	3.9	7.7	0.5	0	0	0	0	0.5	0
Total	82500	170.0	126	69	19	82	17	37	6	3	41	25	6

Table 4.18a-d Alternative 3 EFC proposed research area showing a) total number of sharks kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted kept/discards in the research fishery. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: PLL logbook data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	12795	21	15	5	2	12	0	0	0	0	10	2	0
2	14588	26	9	0	2	3	0	57	0	0	28	2	0
3	25427	90	42	8	3	23	11	8	4	4	3	3	0
4	52754	185	108	24	9	53	1	19	4	0	27	3	0
5	75960	53	131	46	47	72	9	20	7	8	9	11	2
6	61163	28	138	84	10	58	16	5	34	6	0	24	4
7	57766	265	53	10	16	18	5	68	5	0	5	1	2
8	39034	18	85	48	6	18	5	7	0	0	2	0	0
9	77477	33	160	122	21	38	6	8	1	1	3	17	7
10	56917	4	101	45	9	40	2	0	10	5	0	25	2
11	35018	0	101	34	5	39	6	0	1	0	0	12	0
12	38738	1	44	9	21	54	3	0	2	0	0	2	3
Total	547637	724	987	435	151	428	64	192	68	24	87	102	20

b. Average monthly catch

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	2132.5	3.5	2.5	0.8	0.3	2.0	0	0	0	0	1.7	0.3	0
2	2431.3	4.3	1.5	0	0.3	0.5	0	9.5	0	0	4.7	0.3	0
3	4237.8	15.0	7.0	1.3	0.5	3.8	1.8	1.3	0.7	0.7	0.5	0.5	0
4	8792.3	30.8	18.0	4.0	1.5	8.8	0.2	3.2	0.7	0.0	4.5	0.5	0
5	12660.0	8.8	21.8	7.7	7.8	12.0	1.5	3.3	1.2	1.3	1.5	1.8	0.3
6	10193.8	4.7	23.0	14.0	1.7	9.7	2.7	0.8	5.7	1.0	0	4.0	0.7
7	9627.7	44.2	8.8	1.7	2.7	3.0	0.8	11.3	0.8	0	0.8	0.2	0.3
8	6505.7	3.0	14.2	8.0	1.0	3.0	0.8	1.2	0.0	0	0.3	0.0	0
9	12912.8	5.5	26.7	20.3	3.5	6.3	1.0	1.3	0.2	0.2	0.5	2.8	1.2
10	9486.2	0.7	16.8	7.5	1.5	6.7	0.3	0	1.7	0.8	0	4.2	0.3
11	5836.3	0	16.8	5.7	0.8	6.5	1.0	0	0.2	0	0	2.0	0
12	6456.3	0.2	7.3	1.5	3.5	9.0	0.5	0	0.3	0	0	0.3	0.5

c. Average monthly CPUE

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	2132.5	0.0016	0.0012	0.0004	0.0002	0.0009	0	0	0	0	0.0008	0.0002	0
2	2431.3	0.0018	0.0006	0	0.0001	0.0002	0	0.0039	0	0	0.0019	0.0001	0
3	4237.8	0.0035	0.0017	0.0003	0.0001	0.0009	0.0004	0.0003	0.0002	0.0002	0.0001	0.0001	0
4	8792.3	0.0035	0.0020	0.0005	0.0002	0.0010	0	0.0004	0.0001	0	0.0005	0.0001	0
5	12660.0	0.0007	0.0017	0.0006	0.0006	0.0009	0.0001	0.0003	0.0001	0.0001	0.0001	0.0001	0
6	10193.8	0.0005	0.0023	0.0014	0.0002	0.0009	0.0003	0.0001	0.0006	0.0001	0	0.0004	0.0001
7	9627.7	0.0046	0.0009	0.0002	0.0003	0.0003	0.0001	0.0012	0.0001	0	0.0001	0	0
8	6505.7	0.0005	0.0022	0.0012	0.0002	0.0005	0.0001	0.0002	0	0	0.0001	0	0
9	12912.8	0.0004	0.0021	0.0016	0.0003	0.0005	0.0001	0.0001	0	0	0	0.0002	0.0001
10	9486.2	0.0001	0.0018	0.0008	0.0002	0.0007	0	0	0.0002	0.0001	0	0.0004	0
11	5836.3	0	0.0029	0.0010	0.0001	0.0011	0.0002	0	0	0	0	0.0003	0
12	6456.3	0	0.0011	0.0002	0.0005	0.0014	0.0001	0	0.0001	0	0	0.0001	0.0001

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	9.0	6.4	2.1	0.9	5.2	0	0	0	0	4.3	0.9	0
2	5500	9.8	3.4	0	0.8	1.1	0	21.5	0	0	10.6	0.8	0
3	5500	19.5	9.1	1.7	0.6	5.0	2.4	1.7	0.9	0.9	0.6	0.6	0
4	5500	19.3	11.3	2.5	0.9	5.5	0.1	2.0	0.4	0.0	2.8	0.3	0
5	5500	3.8	9.5	3.3	3.4	5.2	0.7	1.4	0.5	0.6	0.7	0.8	0.1
6	5500	2.5	12.4	7.6	0.9	5.2	1.4	0.4	3.1	0.5	0.0	2.2	0.4
7	5500	25.2	5.0	1.0	1.5	1.7	0.5	6.5	0.5	0	0.5	0.1	0.2
8	5500	2.5	12.0	6.8	0.8	2.5	0.7	1.0	0	0	0.3	0.0	0
9	5500	2.3	11.4	8.7	1.5	2.7	0.4	0.6	0.1	0.1	0.2	1.2	0.5
10	5500	0.4	9.8	4.3	0.9	3.9	0.2	0	1.0	0.5	0	2.4	0.2
11	5500	0	15.9	5.3	0.8	6.1	0.9	0	0.2	0.0	0	1.9	0
12	5500	0.1	6.2	1.3	3.0	7.7	0.4	0	0.3	0.0	0	0.3	0.4
Total	66000	94.6	112.3	44.6	16.0	51.8	7.7	35.1	6.8	2.5	19.9	11.4	1.8

Table 4.19 Alternative 3 Charleston Bump and EFC proposed research areas combined showing the total number of sharks predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.11d (Charleston Bump research area) and Table 4.14d (EFC research area under Alternative 2). LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: PLL logbook data 1995-2000.

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	9.0	6.4	2.1	0.9	5.2	0	0	0	0	4.3	0.9	0
2	11000	15.1	5.4	0.6	3.0	14.9	0.8	33.0	0.3	0.4	23.2	3.8	1.1
3	11000	27.7	11.7	2.9	2.6	13.5	3.7	9.0	1.0	0.9	11.9	2.7	2.1
4	11000	23.8	18.6	5.9	2.1	12.5	1.1	5.9	1.3	0.2	6.1	3.5	0.7
5	5500	3.8	9.5	3.3	3.4	5.2	0.7	1.4	0.5	0.6	0.7	0.8	0.1
6	5500	2.5	12.4	7.6	0.9	5.2	1.4	0.4	3.1	0.5	0.0	2.2	0.4
7	5500	25.2	5.0	1.0	1.5	1.7	0.5	6.5	0.5	0	0.5	0.1	0.2
8	5500	2.5	12.0	6.8	0.8	2.5	0.7	1.0	0.0	0	0.3	0.0	0.0
9	5500	2.3	11.4	8.7	1.5	2.7	0.4	0.6	0.1	0.1	0.2	1.2	0.5
10	5500	0.4	9.8	4.3	0.9	3.9	0.2	0	1.0	0.5	0.0	2.4	0.2
11	5500	0	15.9	5.3	0.8	6.1	0.9	0	0.2	0.0	0.0	1.9	0
12	5500	0.1	6.2	1.3	3.0	7.7	0.4	0	0.3	0.0	0.0	0.3	0.4
Total	82500	113	124	50	21	81	11	58	8	3	47	20	6

Table 4.20a-d Alternatives 2 and 3, Charleston Bump research area only, showing a) total number of swordfish and tunas observed kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted catch/discards in the research fishery.
 Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
2	13446	126	234	75	0	0	0	67	12	15	0	0	3
3	20260	348	696	579	0	0	0	36	6	0	2	0	3
4	22395	314	642	249	0	0	0	51	10	0	6	0	0
Total	56101	788	1572	903	0	0	0	154	28	15	8	0	6

b. Average monthly catch

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
2	2241.0	21.0	39.0	12.5	0	0	0	11.2	2.0	2.5	0	0	0.5
3	3376.7	58.0	116.0	96.5	0	0	0	6.0	1.0	0	0.3	0	0.5
4	3732.5	52.3	107.0	41.5	0	0	0	8.5	1.7	0	1.0	0	0

c. Average monthly CPUE

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
2	2241.0	0.0094	0.0174	0.0056	0	0	0	0.0050	0.0009	0.0011	0	0	0.0002
3	3376.7	0.0172	0.0344	0.0286	0	0	0	0.0018	0.0003	0	0.0001	0	0.0001
4	3732.5	0.0140	0.0287	0.0111	0	0	0	0.0023	0.0004	0	0.0003	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
2	5500	51.5	95.7	30.7	0	0	0	27.4	4.9	6.1	0	0	1.2
3	5500	94.5	188.9	157.2	0	0	0	9.8	1.6	0	0.5	0	0.8
4	5500	77.1	157.7	61.2	0	0	0	12.5	2.5	0	1.5	0	0
Total	16500	223.1	442.3	249.0	0	0	0	49.7	9.0	6.1	2.0	0	2.0

Table 4.21a-d Alternative 2 EFC proposed research area only showing a) total number of swordfish and tunas observed kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted catch/discards in the research fishery. Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	765	6	3	4	0	0	0	1	0	0	0	0	0
5	310	2	3	3	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	606	12	3	0	0	0	0	6	0	0	0	0	0
8	465	1	3	0	0	0	0	0	0	0	0	0	0
9	2700	65	45	2	0	0	0	2	1	1	0	2	0
10	1330	59	51	10	0	0	0	64	3	0	0	0	0
11	2228	99	50	3	0	0	0	14	5	4	2	0	0
12	2525	30	20	11	0	0	0	10	6	0	0	0	0
Total	10929	274	178	33	0	0	0	97	15	5	2	2	0

b. Average monthly catch

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	128	1.0	0.5	0.7	0	0	0	0.2	0	0	0	0	0
5	52	0.3	0.5	0.5	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	101	2.0	0.5	0	0	0	0	1.0	0	0	0	0	0
8	78	0.2	0.5	0	0	0	0	0	0	0	0	0	0
9	450	10.8	7.5	0.3	0	0	0	0.3	0.2	0.2	0	0.3	0
10	222	9.8	8.5	1.7	0	0	0	10.7	0.5	0	0	0	0
11	371	16.5	8.3	0.5	0	0	0	2.3	0.8	0.7	0.3	0	0
12	421	5.0	3.3	1.8	0	0	0	1.7	1.0	0	0	0	0

c. Average monthly CPUE

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	128	0.0078	0.0039	0.0052	0	0	0	0.0013	0	0	0	0	0
5	52	0.0065	0.0097	0.0097	0	0	0	0.0000	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	101	0.0198	0.0050	0	0	0	0	0.0099	0	0	0	0	0
8	78	0.0022	0.0065	0	0	0	0	0.0000	0	0	0	0	0
9	450	0.0241	0.0167	0.0007	0	0	0	0.0007	0.0004	0.0004	0	0.0007	0
10	222	0.0444	0.0383	0.0075	0	0	0	0.0481	0.0023	0	0	0	0
11	371	0.0444	0.0224	0.0013	0	0	0	0.0063	0.0022	0.0018	0.0009	0	0
12	421	0.0119	0.0079	0.0044	0	0	0	0.0040	0.0024	0	0	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	5500	0	0	0	0	0	0	0	0	0	0	0	0
3	5500	0	0	0	0	0	0	0	0	0	0	0	0
4	5500	43.1	21.6	28.8	0	0	0	7.2	0	0	0	0	0
5	5500	35.5	53.2	53.2	0	0	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0	0
7	5500	108.9	27.2	0	0	0	0	54.5	0	0	0	0	0
8	5500	11.8	35.5	0	0	0	0	0	0	0	0	0	0
9	5500	132.4	91.7	4.1	0	0	0	4.1	2.0	2.0	0	4.1	0
10	5500	244.0	210.9	41.4	0	0	0	264.7	12.4	0	0	0	0
11	5500	244.4	123.4	7.4	0	0	0	34.6	12.3	9.9	4.9	0	0
12	5500	65.3	43.6	24.0	0	0	0	21.8	13.1	0	0	0	0
Total	66000	885.5	607.1	158.8	0	0	0	386.7	39.9	11.9	4.9	4.1	0

Table 4.22 Alternative 2 Charleston Bump and EFC proposed research areas combined showing the total number of swordfish and tunas predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.20d (Charleston Bump research area) and Table 4.21d (EFC research area under Alternative 2). Source: POP data 1995-2000.

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	11000	51.5	95.7	30.7	0	0	0	34.7	1.3	0.5	0.1	0	0
3	11000	94.5	188.9	157.2	0	0	0	32.1	1.0	0.4	0.1	0	0
4	11000	120.3	179.2	89.9	0	0	0	40.9	1.0	0.3	0.1	0	0
5	5500	35.5	53.2	53.2	0	0	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0	0
7	5500	108.9	27.2	0	0	0	0	54.5	0	0	0	0	0
8	5500	11.8	35.5	0	0	0	0	0	0	0	0	0	0
9	5500	132.4	91.7	4.1	0	0	0	4.1	2.0	2.0	0	4.1	0
10	5500	244.0	210.9	41.4	0	0	0	264.7	12.4	0	0	0	0
11	5500	244.4	123.4	7.4	0	0	0	34.6	12.3	9.9	4.9	0	0
12	5500	65.3	43.6	24.0	0	0	0	21.8	13.1	0	0	0	0
Total	82500	1108.6	1049.4	407.8	0	0	0	487.3	43.2	13.1	5.2	4.1	0

Table 4.23a-d Alternative 3 EFC proposed research area only showing a) total number of swordfish and tunas observed kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted catch/discards in the research fishery. Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2593	35	6	4	0	0	0	0	0	0	1	0	0
5	670	4	4	4	0	0	0	0	0	0		0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1384	22	6	1	0	0	0	9	1	0	7		1
8	850	5	4	0	0	0	0	3	0	0	0	0	0
9	2700	65	45	2	0	0	0	2	1	1	0	2	0
10	1970	67	61	10	0	0	0	65	3		2	0	0
11	2228	99	50	3	0	0	0	14	5	4	2	0	0
12	3524	44	32	17	0	0	0	22	6	0	1	0	0
Total	15919	341	208	41	0	0	0	115	16	5	13	2	1

b. Average monthly catch

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	432	5.83	1.00	0.67	0	0	0	0	0	0	0.17	0	0
5	112	0.67	0.67	0.67	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	231	3.67	1.00	0.17	0	0	0	1.50	0.17	0	1.17	0	0.17
8	142	0.83	0.67	0	0	0	0	0.50	0	0	0	0	0
9	450	10.83	7.50	0.33	0	0	0	0.33	0.17	0.17	0	0.33	0
10	328	11.17	10.17	1.67	0	0	0	10.83	0.50	0.00	0.33	0	0
11	371	16.50	8.33	0.50	0	0	0	2.33	0.83	0.67	0.33	0	0
12	587	7.33	5.33	2.83	0	0	0	3.67	1.00	0	0.17	0	0

c. Average monthly CPUE

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	432	0.0135	0.0023	0.0015	0	0	0	0	0	0	0.0004	0	0
5	112	0.0060	0.0060	0.0060	0	0	0	0	0	0	0.0000	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	231	0.0159	0.0043	0.0007	0	0	0	0.0065	0.0007	0	0.0051	0	0.0007
8	142	0.0059	0.0047	0	0	0	0	0.0035	0	0	0	0	0
9	450	0.0241	0.0167	0.0007	0	0	0	0.0007	0.0004	0.0004	0	0.0007	0
10	328	0.0340	0.0310	0.0051	0	0	0	0.0330	0.0015	0	0.0010	0	0
11	371	0.0444	0.0224	0.0013	0	0	0	0.0063	0.0022	0.0018	0.0009	0	0
12	587	0.0125	0.0091	0.0048	0	0	0	0.0062	0.0017	0	0.0003	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	5500	0	0	0	0	0	0	0	0	0	0	0	0
3	5500	0	0	0	0	0	0	0	0	0	0	0	0
4	5500	74.2	12.7	8.5	0	0	0	0	0	0	2.1	0	0
5	5500	32.8	32.8	32.8	0	0	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0	0
7	5500	87.4	23.8	4.0	0	0	0	35.8	4.0	0	27.8	0	4.0
8	5500	32.4	25.9	0	0	0	0	19.4	0	0	0	0	0
9	5500	132.4	91.7	4.1	0	0	0	4.1	2.0	2.0	0	4.1	0
10	5500	187.1	170.3	27.9	0	0	0	181.5	8.4	0	5.6	0	0
11	5500	244.4	123.4	7.4	0	0	0	34.6	12.3	9.9	4.9	0	0
12	5500	68.7	49.9	26.5	0	0	0	34.3	9.4	0	1.6	0	0
Total	66000	859.4	530.6	111.2	0	0	0	309.6	36.1	11.9	42.0	4.1	4.0

Table 4.24 Alternative 3 Charleston Bump and EFC proposed research areas combined showing the total number of swordfish and tunas predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.20d (Charleston Bump research area) and Table 4.23d (EFC research area under Alternative 2). Source: POP data 1995-2000.

Month	Hooks	Swordfish Kept	Swordfish Disc Alive	Swordfish Disc Dead	Bluefin Kept	Bluefin Disc Alive	Bluefin Disc Dead	Yellowfin Kept	Yellowfin Disc Alive	Yellowfin Disc Dead	Bigeye Kept	Bigeye Disc Alive	Bigeye Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	11000	51.5	95.7	30.7	0	0	0	27.4	4.9	6.1	0	0	1.2
3	11000	94.5	188.9	157.2	0	0	0	9.8	1.6	0.0	0.5	0	0.8
4	11000	151.4	170.4	69.6	0	0	0	12.5	2.5	0	3.6	0	0
5	5500	32.8	32.8	32.8	0	0	0	0	0	0	0	0	0
6	5500	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0
7	5500	87.4	23.8	4.0	0	0	0	35.8	4.0	0	27.8	0	4.0
8	5500	32.4	25.9	0.0	0	0	0	19.4	0	0	0	0	0
9	5500	132.4	91.7	4.1	0	0	0	4.1	2.0	2.0	0	4.1	0
10	5500	187.1	170.3	27.9	0	0	0	181.5	8.4	0	5.6	0	0
11	5500	244.4	123.4	7.4	0	0	0	34.6	12.3	9.9	4.9	0	0
12	5500	68.7	49.9	26.5	0	0	0	34.3	9.4	0	1.6	0	0
Total	82500	1082.5	973.0	360.2	0	0	0	359.3	45.1	18.0	44.0	4.1	6.0

Table 4.25a-d Alternatives 2 and 3, Charleston Bump research area only, showing a) total number of billfish and sea turtles observed discarded from 1995-2000 in the East Florida Coast proposed research area; b) average monthly catch; c) average monthly CPUEs; and, d) predicted discards in the research fishery. Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leatherback	Loggerhead	Other Sea turtles
2	13446	2	3	2	0	0	3	0	0	0	3	3
3	20260	4	0	2	3	0	0	0	0	6	3	0
4	22395	12	24	2	6	4	0	0	0	0	6	0
Total	56101	18	27	6	9	4	3	0	0	6	12	3

b. Average monthly catch

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leatherback	Loggerhead	Other Sea turtles
2	2241	0.3	0.5	0.3	0	0	0.5	0	0	0	0.5	0.5
3	3377	0.7	0	0.3	0.5	0	0	0	0	1.0	0.5	0
4	3733	2.0	4.0	0.3	1.0	0.7	0	0	0	0	1.0	0

c. Average monthly CPUE

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leatherback	Loggerhead	Other Sea turtles
2	2241	0.0001	0.0002	0.0001	0	0	0.0002	0	0	0	0.0002	0.0002
3	3377	0.0002	0	0.0001	0.0001	0	0	0	0	0.0003	0.0001	0
4	3733	0.0005	0.0011	0.0001	0.0003	0.0002	0	0	0	0	0.0003	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leatherback	Loggerhead	Other Sea turtles
2	5500	0.8	1.2	0.8	0	0	1.2	0	0	0	1.2	1.2
3	5500	1.1	0	0.5	0.8	0	0	0	0	1.6	0.8	0
4	5500	2.9	5.9	0.5	1.5	1.0	0	0	0	0	1.5	0
Total	16500	4.9	7.1	1.9	2.3	1.0	1.2	0	0	1.6	3.5	1.2

Table 4.26 Alternative 2 EFC research area only, showing a) total number of billfish and sea turtles observed discarded from 1995-2000 in the East Florida Coast proposed research area; b) average monthly catch; c) average monthly CPUEs; and, d) predicted discards in the research fishery. Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	765	0	0	0	0	0	0	0	0	0	0	0
5	310	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	606	0	0	0	0	2	1	0	0	0	0	0
8	465	1	0	0	0	0	0	0	0	0	0	0
9	2700	0	1	0	0	1	2	0	0	0	0	0
10	1330	0	0	0	0	1	0	0	0	0	0	0
11	2228	0	0	0	0	0	0	0	0	0	0	0
12	2525	0	0	0	0	0	0	0	0	0	0	0
Total	10929	1	1	0	0	4	3	0	0	0	0	0

b. Average monthly catch

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	127.5	0	0	0	0	0	0	0	0	0	0	0
5	51.7	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	101.0	0	0	0	0	0.3	0.2	0	0	0	0	0
8	77.5	0.2	0	0	0	0	0	0	0	0	0	0
9	450.0	0	0.2	0	0	0.2	0.3	0	0	0	0	0
10	221.7	0	0	0	0	0.2	0	0	0	0	0	0
11	371.3	0	0	0	0	0	0	0	0	0	0	0
12	420.8	0	0	0	0	0	0	0	0	0	0	0

c. Average monthly CPUE

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	127.5	0	0	0	0	0	0	0	0	0	0	0
5	51.7	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	101.0	0	0	0	0	0.0033	0.0017	0	0	0	0	0
8	77.5	0.0022	0	0	0	0	0	0	0	0	0	0
9	450.0	0	0.0004	0	0	0.0004	0.0007	0	0	0	0	0
10	221.7	0	0	0	0	0.0008	0	0	0	0	0	0
11	371.3	0	0	0	0	0	0	0	0	0	0	0
12	420.8	0	0	0	0	0	0	0	0	0	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	5500	0	0	0	0	0	0	0	0	0	0	0
2	5500	0	0	0	0	0	0	0	0	0	0	0
3	5500	0	0	0	0	0	0	0	0	0	0	0
4	5500	0	0	0	0	0	0	0	0	0	0	0
5	5500	0	0	0	0	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0
7	5500	0	0	0	0	18.2	9.1	0	0	0	0	0
8	5500	11.8	0	0	0	0	0	0	0	0	0	0
9	5500	0	2.0	0	0	2.0	4.1	0	0	0	0	0
10	5500	0	0	0	0	4.1	0.0	0	0	0	0	0
11	5500	0	0	0	0	0	0	0	0	0	0	0
12	5500	0	0	0	0	0	0	0	0	0	0	0
Total	66000	11.8	2.0	0	0	24.3	13.1	0	0	0	0	0

Table 4.27 Alternative 2 Charleston Bump and EFC proposed research areas combined showing the total number of billfish and sea turtles predicted to be discarded in the research fishery. Numbers derived by summing Tables 4.25d (Charleston Bump research area) and Table 4.26d (EFC research area under Alternative 2). Source POP data 1995-2000.

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	5500	0	0	0	0	0	0	0	0	0	0	0
2	11000	0.8	1.2	0.8	0	0	1.2	0	0	0	1.2	1.2
3	11000	1.1	0	0.5	0.8	0	0	0	0	1.6	0.8	0
4	11000	2.9	5.9	0.5	1.5	1.0	0	0	0	0	1.5	0
5	5500	0	0	0	0	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0
7	5500	0	0	0	0	18.2	9.1	0	0	0	0	0
8	5500	11.8	0	0	0	0	0	0	0	0	0	0
9	5500	0	2.0	0	0	2.0	4.1	0	0	0	0	0
10	5500	0	0	0	0	4.1	0	0	0	0	0	0
11	5500	0	0	0	0	0	0	0	0	0	0	0
12	5500	0	0	0	0	0	0	0	0	0	0	0
Total	82500	16.7	9.2	1.9	2.3	25.3	14.4	0	0	1.6	3.5	1.2

Table 4.28 Alternative 3 EFC research area only, showing a) total number of billfish and sea turtles observed discarded from 1995-2000 in the East Florida Coast proposed research area; b) average monthly catch; c) average monthly CPUEs; and, d) predicted discards in the research fishery. Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	2593	2	1	1	2	1	1	0	0	0	1	0
5	670	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	1384	0	0	1	0	3	1	0	0	0	0	0
8	850	0	0	0	0	0	0	0	0	0	0	0
9	2700	0	1	0	2	1	2	0	0	0	0	0
10	1970	0	0	0	0	1	0	0	0	0	0	0
11	2228	0	0	0	0	0	0	0	0	0	0	0
12	3524	0	1	1	2	0	0	0	0	0	0	0
Total	15919	2	3	3	6	6	4	0	0	0	1	0

b. Average monthly catch

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	432.2	0.3	0.2	0.2	0.3	0.2	0.2	0	0	0	0.2	0
5	111.7	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	230.7	0	0	0.2	0	0.5	0.2	0	0	0	0	0
8	141.7	0	0	0	0	0	0	0	0	0	0	0
9	450.0	0	0.2	0	0.3	0.2	0.3	0	0	0	0	0
10	328.3	0	0	0	0	0.2	0	0	0	0	0	0
11	371.3	0	0	0	0	0	0	0	0	0	0	0
12	587.3	0	0.2	0.2	0.3	0	0	0	0	0	0	0

c. Average monthly CPUE

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	432.2	0.0008	0.0004	0.0004	0.0008	0.0004	0.0004	0	0	0	0.0004	0
5	111.7	0	0	0	0	0	0	0	0	0	0	0
6	0.0	0	0	0	0	0	0	0	0	0	0	0
7	230.7	0	0	0.0007	0	0.0022	0.0007	0	0	0	0	0
8	141.7	0	0	0	0	0	0	0	0	0	0	0
9	450.0	0	0.0004	0	0.0007	0.0004	0.0007	0	0	0	0	0
10	328.3	0	0	0	0	0.0005	0	0	0	0	0	0
11	371.3	0	0	0	0	0	0	0	0	0	0	0
12	587.3	0	0.0003	0.0003	0.0006	0	0	0	0	0	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	5500	0	0	0	0	0	0	0	0	0	0	0
2	5500	0	0	0	0	0	0	0	0	0	0	0
3	5500	0	0	0	0	0	0	0	0	0	0	0
4	5500	4.2	2.1	2.1	4.2	2.1	2.1	0	0	0	2.1	0
5	5500	0	0	0	0	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0
7	5500	0	0	4.0	0	11.9	4.0	0	0	0	0	0
8	5500	0	0	0	0	0	0	0	0	0	0	0
9	5500	0	2.0	0	4.1	2.0	4.1	0	0	0	0	0
10	5500	0	0	0	0	2.8	0	0	0	0	0	0
11	5500	0	0	0.0	0	0	0	0	0	0	0	0
12	5500	0	1.6	1.6	3.1	0.0	0	0	0	0	0	0
Total	66000	4.2	5.7	7.7	11.4	18.9	10.2	0	0	0	2.1	0

Table 4.29 Alternative 3 Charleston Bump and EFC proposed research areas combined showing the total number of billfish and sea turtles predicted to be discarded in the research fishery. Numbers derived by summing Tables 4.25d (Charleston Bump research area) and Table 4.28d (EFC research area under Alternative 2). Source POP data 1995-2000.

Month	Hooks	White Marlin Discards Alive	White Marlin Discards Dead	Blue Marlin Discards Alive	Blue Marlin Discards Dead	Sailfish Discards Alive	Sailfish Discards Dead	Spearfish Discards Alive	Spearfish Discards Dead	Leather-back Sea Turtles	Logger-head Sea Turtles	Other Sea turtles
1	5500	0	0	0	0	0	0	0	0	0	0	0
2	11000	0.8	1.2	0.8	0	0	1.2	0	0	0	1.2	1.2
3	11000	1.1	0	0.5	0.8	0	0	0	0	1.6	0.8	0
4	11000	7.2	8.0	2.6	5.7	3.1	2.1	0	0	0	3.6	0
5	5500	0	0	0	0	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0
7	5500	0	0	4.0	0	11.9	4.0	0	0	0	0	0
8	5500	0	0	0	0	0	0	0	0	0	0	0
9	5500	0	2.0	0	4.1	2.0	4.1	0	0	0	0	0
10	5500	0	0	0	0	2.8	0	0	0	0	0	0
11	5500	0	0	0	0	0	0	0	0	0	0	0
12	5500	0	1.6	1.6	3.1	0.0	0	0	0	0	0	0
Total	82500	9.1	12.8	9.5	13.7	19.9	11.4	0	0	1.6	5.6	1.2

Table 4.30 Alternatives 2 and 3 for the Charleston Bump proposed research area showing a) total number of sharks observed kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted kept/discarded sharks in the research fishery. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	13446	9	26	21	3	10	111	0	0	0	1	6	0
3	20260	109	58	57	6	6	171	0	0	3	58	34	18
4	22395	18	232	123	2	14	87	1	0	0	12	2	0
Total	56101	136	316	201	11	30	369	1	0	3	71	42	18

b. Average monthly catch

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	2241.0	1.5	4.3	3.5	0.5	1.7	18.5	0	0	0	0.2	1.0	0
3	3376.7	18.2	9.7	9.5	1.0	1.0	28.5	0	0	0.5	9.7	5.7	3.0
4	3732.5	3.0	38.7	20.5	0.3	2.3	14.5	0.2	0	0	2.0	0.3	0

c. Average monthly CPUE

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	2241.0	0.0007	0.0019	0.0016	0.0002	0.0007	0.0083	0	0	0	0.0001	0.0004	0
3	3376.7	0.0054	0.0029	0.0028	0.0003	0.0003	0.0084	0	0	0.0001	0.0029	0.0017	0.0009
4	3732.5	0.0008	0.0104	0.0055	0.0001	0.0006	0.0039	0	0	0	0.0005	0.0001	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
2	5500	3.7	10.6	8.6	1.2	4.1	45.4	0	0	0	0.4	2.5	0
3	5500	29.6	15.7	15.5	1.6	1.6	46.4	0	0	0.8	15.7	9.2	4.9
4	5500	4.4	57.0	30.2	0.5	3.4	21.4	0.2	0	0	2.9	0.5	0.0
Total	16500	37.7	83.4	54.3	3.3	9.2	113.2	0.2	0	0.8	19.1	12.2	4.9

Table 4.31a-d Alternative 2 EFC research area showing a) total number of sharks observed kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted kept/discards in the research fishery. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: POP data 1995-2000.

Total number kept/discarded over six years (1995-2000)

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	765	4	0	7	0	0	1	0	0	0	0	0	0
5	310	0	1	1	0	1	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	606	5	2	2	1	2	1	0	0	0	0	0	0
8	465	0	3	4	0	0	0	0	0	0	0	0	0
9	2700	8	16	6	1	2	2	0	0	0	0	0	0
10	1330	0	1	9	0	2	0	0	0	0	0	0	0
11	2228	0	12	6	0	1	1	0	0	0	0	0	0
12	2525	0	4	6	0	6	4	0	0	0	0	0	0
Total	306384	17	39	41	2	14	9	0	0	0	0	0	0

b. Average monthly catch

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	127.5	0.7	0	1.2	0	0	0.2	0	0	0	0	0	0
5	51.7	0	0.2	0.2	0	0.2	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	101.0	0.8	0.3	0.3	0.2	0.3	0.2	0	0	0	0	0	0
8	77.5	0	0.5	0.7	0	0	0	0	0	0	0	0	0
9	450.0	1.3	2.7	1.0	0.2	0.3	0.3	0	0	0	0	0	0
10	221.7	0	0.2	1.5	0	0.3	0	0	0	0	0	0	0
11	371.3	0	2.0	1.0	0	0.2	0.2	0	0	0	0	0	0
12	420.8	0	0.7	1.0	0	1.0	0.7	0	0	0	0	0	0

c. Average monthly CPUE

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	127.5	0.0052	0	0.0092	0	0	0.0013	0	0	0	0	0	0
5	51.7	0	0.0032	0.0032	0	0.0032	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	101.0	0.0083	0.0033	0.0033	0.0017	0.0033	0.0017	0	0	0	0	0	0
8	77.5	0	0.0065	0.0086	0	0	0	0	0	0	0	0	0
9	450.0	0.0030	0.0059	0.0022	0.0004	0.0007	0.0007	0	0	0	0	0	0
10	221.7	0	0.0008	0.0068	0	0.0015	0	0	0	0	0	0	0
11	371.3	0	0.0054	0.0027	0	0.0004	0.0004	0	0	0	0	0	0
12	420.8	0	0.0016	0.0024	0	0.0024	0.0016	0	0	0	0	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	5500	0	0	0	0	0	0	0	0	0	0	0	0
3	5500	0	0	0	0	0	0	0	0	0	0	0	0
4	5500	28.8	0	50.3	0	0	7.2	0	0	0	0	0	0
5	5500	0	17.7	17.7	0	17.7	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0	0
7	5500	45.4	18.2	18.2	9.1	18.2	9.1	0	0	0	0	0	0
8	5500	0	35.5	47.3	0	0	0	0	0	0	0	0	0
9	5500	16.3	32.6	12.2	2.0	4.1	4.1	0	0	0	0	0	0
10	5500	0	4.1	37.2	0	8.3	0.0	0	0	0	0	0	0
11	5500	0	29.6	14.8	0	2.5	2.5	0	0	0	0	0	0
12	5500	0	8.7	13.1	0	13.1	8.7	0	0	0	0	0	0
Total	66000	90.4	146.4	210.9	11.1	63.8	31.5	0	0	0	0	0	0

Table 4.32 Alternative 2 Charleston Bump and EFC proposed research areas combined showing the total number of sharks predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.30d (Charleston Bump research area) and Table 4.31d (EFC research area under Alternative 2). LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: POP data 1995-2000.

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	11000	3.7	10.6	8.6	1.2	4.1	45.4	0	0	0	0.4	2.5	0
3	11000	29.6	15.7	15.5	1.6	1.6	46.4	0	0	0.8	15.7	9.2	4.9
4	11000	33.2	57.0	80.5	0.5	3.4	28.6	0.2	0	0	2.9	0.5	0
5	5500	0	17.7	17.7	0.0	17.7	0	0	0	0	0	0	0
6	5500	0	0	0	0	0	0	0	0	0	0	0	0
7	5500	45.4	18.2	18.2	9.1	18.2	9.1	0	0	0	0	0	0
8	5500	0	35.5	47.3	0	0	0	0	0	0	0	0	0
9	5500	16.3	32.6	12.2	2.0	4.1	4.1	0	0	0	0	0	0
10	5500	0	4.1	37.2	0	8.3	0	0	0	0	0	0	0
11	5500	0	29.6	14.8	0	2.5	2.5	0	0	0	0	0	0
12	5500	0	8.7	13.1	0	13.1	8.7	0	0	0	0	0	0
Total	82500	128.1	229.8	265.1	14.5	72.9	144.7	0.2	0.0	0.8	19.1	12.2	4.9

Table 4.33 Alternative 3 EFC research area showing a) total number of sharks observed kept and discarded from 1995-2000; b) average monthly catch; c) average monthly CPUEs; and, d) predicted kept/discards in the research fishery. LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: POP data 1995-2000.

a. Total number kept/discarded over six years (1995-2000)

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	2593	4	2	18	0	2	7	0	0	0	1	0	0
5	670	0	0	2	1	1	2	0	0	0	0	1	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1384	5	0	3	2	2	1	0	0	0	0	0	0
8	850	0	6	4	0	0	1	0	0	0	0	2	3
9	2700	8	16	5	1	2	3	0	0	0	2	3	4
10	1970	0	4	6	1	2	6	0	0	0	0	0	0
11	2228	0	12	6	0	1	1	0	0	0	0	0	0
12	3524	0	16	12	1	9	5	0	0	0	0	0	0
Total	547637	724	987	435	151	428	64	192	68	24	87	102	20

b. Average monthly catch

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	432.2	0.7	0.3	3.0	0	0.3	1.2	0	0	0	0.2	0	0
5	111.7	0	0	0.3	0.2	0.2	0.3	0	0	0	0	0.2	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	230.7	0.8	0	0.5	0.3	0.3	0.2	0	0	0	0	0	0
8	141.7	0	1.0	0.7	0	0	0.2	0	0	0	0	0.3	0.5
9	450.0	1.3	2.7	0.8	0.2	0.3	0.5	0	0	0	0.3	0.5	0.7
10	328.3	0	0.7	1.0	0.2	0.3	1.0	0	0	0	0	0	0
11	371.3	0	2.0	1.0	0.0	0.2	0.2	0	0	0	0	0	0
12	587.3	0	2.7	2.0	0.2	1.5	0.8	0	0	0	0	0	0

c. Average monthly CPUE

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	432.2	0.0015	0.0008	0.0069	0	0.0008	0.0027	0	0	0	0.0004	0	0
5	111.7	0	0	0.0030	0.0015	0.0015	0.0030	0	0	0	0	0.0015	0.0000
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	230.7	0.0036	0	0.0022	0.0014	0.0014	0.0007	0	0	0	0	0	0
8	141.7	0	0.0071	0.0047	0	0	0.0012	0	0	0	0	0.0024	0.0035
9	450.0	0.0030	0.0059	0.0019	0.0004	0.0007	0.0011	0	0	0	0.0007	0.0011	0.0015
10	328.3	0	0.0020	0.0030	0.0005	0.0010	0.0030	0	0	0	0	0	0
11	371.3	0	0.0054	0.0027	0	0.0004	0.0004	0	0	0	0	0	0
12	587.3	0	0.0045	0.0034	0.0003	0.0026	0.0014	0	0	0	0	0	0

d. Predicted monthly kept/discards with 11 sets @ 500 hooks/set

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	5500	0	0	0	0	0	0	0	0	0	0	0	0
3	5500	0	0	0	0	0	0	0	0	0	0	0	0
4	5500	8.5	4.2	38.2	0.0	4.2	14.8	0	0	0	2.1	0	0
5	5500	0	0	16.4	8.2	8.2	16.4	0	0	0	0	8.2	0
6	5500	0	0	0	0	0	0	0	0	0	0	0	0
7	5500	19.9	0	11.9	7.9	7.9	4.0	0	0	0	0	0	0
8	5500	0	38.8	25.9	0	0	6.5	0	0	0	0	12.9	19.4
9	5500	16.3	32.6	10.2	2.0	4.1	6.1	0	0	0	4.1	6.1	8.1
10	5500	0	11.2	16.8	2.8	5.6	16.8	0	0	0	0	0	0
11	5500	0	29.6	14.8	0	2.5	2.5	0	0	0	0	0	0
12	5500	0	25.0	18.7	1.6	14.0	7.8	0	0	0	0	0	0
Total	66000	44.7	141.4	152.9	22.5	46.6	74.8	0	0	0	6.2	27.3	27.6

Table 4.34 Alternative 3 Charleston Bump and EFC proposed research areas combined showing the total number of sharks predicted to be kept and discarded in the research fishery. Numbers derived by summing Tables 4.30d (Charleston Bump research area) and Table 4.33d (EFC research area under Alternative 2). LCS numbers exclude sandbar and dusky sharks which are shown separately. Source: POP data 1995-2000.

Month	Hooks	LCS Kept	LCS Disc Alive	LCS Disc Dead	Pelagics Kept	Pelagics Disc Alive	Pelagics Disc Dead	Sandbar Kept	Sandbar Disc Alive	Sandbar Disc Dead	Dusky Kept	Dusky Disc Alive	Dusky Disc Dead
1	5500	0	0	0	0	0	0	0	0	0	0	0	0
2	11000	3.7	10.6	8.6	1.2	4.1	45.4	0	0	0	0.4	2.5	0
3	11000	29.6	15.7	15.5	1.6	1.6	46.4	0	0	0.8	15.7	9.2	4.9
4	11000	12.9	61.2	68.4	0.5	7.7	36.2	0.2	0	0	5.1	0.5	0
5	5500	0	0	16.4	8.2	8.2	16.4	0	0	0	0	8.2	0
6	5500	0	0	0	0	0	0	0	0	0	0	0	0
7	5500	19.9	0	11.9	7.9	7.9	4.0	0	0	0	0	0	0
8	5500	0	38.8	25.9	0	0.0	6.5	0	0	0	0	12.9	19.4
9	5500	16.3	32.6	10.2	2.0	4.1	6.1	0	0	0	4.1	6.1	8.1
10	5500	0	11.2	16.8	2.8	5.6	16.8	0	0	0	0	0	0
11	5500	0	29.6	14.8	0	2.5	2.5	0	0	0	0	0	0
12	5500	0	25.0	18.7	1.6	14.0	7.8	0	0	0	0	0	0
Total	82500	82.3	224.8	207.1	25.9	55.7	188.0	0.2	0	0.8	25.3	39.4	32.4

5.0 MITIGATION AND UNAVOIDABLE ADVERSE IMPACTS

5.1 Mitigating Measures

As discussed in Chapter 4, the preferred alternative is not anticipated to have any significant ecological, economic, or social impacts given the limited size, scope, and duration of the research. Further, the projected effort expended for this project would not represent an increase in effort as the vessels involved would be otherwise engaged in commercial fishing activities. To reduce and mitigate bycatch and bycatch mortality of target and non-target species, participating vessels would be required to possess and utilize only 18/0 circle hooks with offsets not to exceed 10 degrees to be used with whole fin fish or squid baits. Participating vessels would all be required to possess and utilize protected species disentanglement and release equipment and be certified in its use. Vessels would continue to be bound by all other bycatch reduction requirements, such as moving fishing locations after an interaction with marine mammals or sea turtles. Participating vessels would continue to be bound by all other fishing regulations, including minimum sizes, limited access permit restrictions, prohibited species restrictions, and others. Furthermore, all participating vessels would be subject to 100 percent observer coverage requirements. No sets may be made without the principle investigator, his designee, or a NMFS certified observer onboard the vessel.

To mitigate both ecological and sociological impacts, NMFS carefully selected a study area that is expected to minimize bycatch of target and non-target species, including protected resources, as well as minimize fishing gear conflicts between recreational and commercial participants. The recreational fishing community has opposed previous industry sponsored data collection proposals which would have collected data in areas where gear conflicts between commercial and recreational swordfish fishermen would have been likely. As noted above, NMFS selected the study area specified in the preferred alternative in part to specifically minimize potential gear conflicts with the recreational sector, while still allowing the scientific objectives of the study to be met.

In issuing an EFP to conduct this research, NMFS would include strict bycatch and protected species interaction limits and require participants to immediately contact the HMS Management Division if a protected species interaction should occur. Further, as with all EFPs, the Agency would require that interim summary reports to be submitted to the Agency within five days of the return to port to allow close monitoring of the research project. Any sea turtle interactions would be counted against the ITS in the 2004 BiOp issued for the PLL fishery.

An analysis prepared for the 2006 Consolidated HMS FMP indicated that the PLL time/area closures alone have resulted in large declines in fishing effort and bycatch from the 1997–1999 period to the 2001–2003 period. Overall effort, expressed as the number of hooks set, declined by 15 percent between the two time periods. Declines in discards attributable to the closures have been even more sizeable. For example, the overall number of reported discards of swordfish, bluefin tuna, bigeye tuna, pelagic sharks, blue marlin, white marlin, sailfish and spearfish have all declined by more than 30 percent. Discards of blue and white marlin declined by more than 50 percent, and sailfish discards declined by almost 75 percent. Also, the reported number of sea turtles caught and released declined by almost 28 percent due to the time/area closures alone. In addition, the number of active fishing vessels has declined precipitously by

approximately 45 percent since 2000. Through this study, NMFS is seeking to collect data that will allow the agency to determine if similar bycatch reduction benefits can be achieved or maintained while allowing limited fishing opportunities in portions of the existing closed area through the use of fishing gears and techniques which have been tested and proven to reduce bycatch and bycatch mortality of many species since implementation.

For these reasons, and as discussed in Chapter 4.0 of this EA, NMFS does not expect that the preferred alternative of allowing a limited study in portions of the Charleston Bump and EFC closed areas would have notable adverse ecological, economic, or social impacts so no mitigating measures are proposed beyond those discussed above. NMFS will closely monitor study and will take appropriate action if interactions with protected species, or other bycatch, increase.

5.2 Unavoidable Adverse Impacts

This action will assist NMFS in achieving the objectives of the Consolidated HMS FMP by allowing the collection of data to better gauge the effects of existing regulations and the potential to modify them. For species that are overfished, the limited size and duration of this research study is anticipated to have no adverse impacts given that catches of the United States are only a small percentage of international catches. Further, the United States has been well below its international quota for some species, such as swordfish and bluefin tuna, so any potential increase in catches of these species would not be anticipated to have any significant impact on rebuilding. There is a possibility that catches and discards of undersized swordfish by participating vessels may increase relative to fishing activities of those vessels outside the closed areas, however, the use of circle hooks is anticipated to mitigate mortality of such bycatch. As discussed in previous chapters in this document, interactions with protected resource are anticipated to be minimal.

The preferred alternative is consistent with the Consolidated HMS FMP, the Magnuson-Stevens Act, and other applicable law. In considering the alternatives, NMFS preferred an alternative that would minimize the adverse impacts while allowing for collection of data to achieve the objectives of the Consolidated HMS FMP in a scientifically rigorous manner. Thus, any resulting economic or social impacts are unavoidable.

5.3 Irreversible and Irrecoverable Commitment of Resources

The preferred alternative would assist NMFS in achieving the objectives of this action and the proposed research is not expected to result in any irreversible or irretrievable commitments of resources. The proposed research is of limited duration and scope and has specific goals and objectives that are expected to be produced within a year.

6.0 ECONOMIC EVALUATION

This section assesses the economic impacts of the alternatives presented in this document. Additional economic and social considerations and information are discussed in Chapters 3, 4, 7, and 8 of this document.

6.1 Number of Fishing and Dealer Permit Holders

In order to examine the baseline universe of entities potentially affected by the preferred alternatives, NMFS analyzed the number of permits that were issued as of February 2006 in conjunction with HMS fishing activities. The following tables provide data on sectors that the preferred alternatives may impact.

As of February 2006, there were a total of 365 commercial permit holders in the Atlantic swordfish fishery (191 directed, 86 incidental permits, and 88 handgear). As of September 26, 2006, approximately 176 of these of these vessels had “valid” swordfish permits because they possessed the requisite three limited access permits for swordfish, shark and tunas longline permits. Of those, approximately 48 vessels possess “valid” Incidental swordfish permits. Table 6.1 provides a summary of these commercial permit holders by year. Further detail regarding commercial permit holders is provided in the HMS FMP.

Table 6.1 Swordfish Limited Access Permits Issued From 2002 - 2006. Data for 2001-2005 are as of October 1 for each year.

Year	# Directed Swordfish	# Incidental Swordfish	# Swordfish Handgear
2006*	191	86	88
2005	190	91	92
2004	195	99	96
2003	206	99	95
2002	205	110	94

* Totals for 2006 are as of February 1, 2006

Table 6.2 provides a summary of HMS CHB permit holders, by state. As of February 1, 2006, there were 4,173 HMS CHB permit holders. The highest numbers of HMS CHB permit holders are located in Florida, New Jersey, Massachusetts, and North Carolina.

Table 6.2 HMS CHB Permits by State as of February 1, 2006.

State	CHB permits	State	CHB Permits
AL	76	NH	47
CT	91	NJ	643
DE	129	NV	--
FL	673	OH	2
GA	31	PA	11
LA	93	PR	27
MA	557	RI	163
MD	198	SC	141
ME	64	TN	--
MI	2	TX	166
MS	32	VA	142
NC	465	VI	18
NY	373	Other	23
Total			4,173

The number of HMS Angling category permits was 25,238 as of February 1, 2006. There is no specific swordfish angling permit, so it is not possible to determine the number of recreational anglers that specifically target swordfish.

The alternatives analyzed for this proposed action could impact Directed and Incidental swordfish permit holders, as well as HMS CHB and Angling category permit holders. The tables and numbers presented above indicate that a total of 29,411 HMS CHB and Angling permit holders could be indirectly affected by the proposed scientific research; approximately 48 vessel owners possessing valid Incidental swordfish permits could be affected by the proposed alternative regarding incidental swordfish retention limits; and, approximately 176 vessel owners possessing valid swordfish permits could be affected by the selected alternative regarding PLL vessel upgrading restrictions. In total, the final actions could impact approximately 29,587 HMS permit holders. Of these, 4,397 of these permit holders are considered small entities.

6.2 Gross Revenues of Fishermen

NMFS calculates gross revenues by combining current federal permit holders with their reported logbook landings for 1999 to 2005. These landings are then multiplied by average prices (by region) for swordfish, obtained from dealer reporting. This information is presented in Table 11.

Table 6.3 Estimates of the total ex-vessel annual revenues of Atlantic Swordfish HMS fishery. Sources: NMFS, 2006 and HMS Dealer Reporting forum.

Year	Ex-vessel \$/lb (dw)	Weight lb (dw)	Fishery Revenue
1999	\$3.38	5,942,839	\$20,104,498
2000	\$3.51	4,832,384	\$16,974,346
2001	\$3.74	5,662,350	\$21,153,927
2002	\$3.20	5,985,489	\$19,150,819
2003	\$3.13	4,668,466	\$14,600,627
2004	\$3.57	4,317,369	\$15,391,422
2005	\$3.71	TBD	TBD

Of all Atlantic HMS fisheries, swordfish brings in the highest total gross revenues (~\$15.4 million total in 2004) for any single species. If gross revenues from the swordfish fishery are averaged across the approximately 110 active PLL vessels, then the average annual gross revenue from swordfish fishing is just under \$140 thousand per vessel per year. In recent years, swordfish ex-vessel prices and total revenues have gradually been recovering from a low in 2003.

Table 6.4 provides data on the prices swordfish fishermen received at the dock. Mean values for ex-vessel prices were derived from the HMS Dealer reporting forms submitted to the NMFS Southeast Regional Office (SERO) and Northeast Regional Office (NERO). Table 6.4 reports ex-vessel prices by region and year for swordfish.

The ex-vessel price data indicates fairly stable national average ex-vessel prices since 1999, with prices fluctuating between \$3.13 and \$3.74. However, prices have not risen over time to keep up with inflation. Over the past two years however, it appears that ex-vessel prices are beginning to trend upward.

Table 6.4 Swordfish ex-vessel prices by region. Source: HMS Dealer reports submitted to the South East Regional Office (SERO) and Northeast Regional Office (NERO).

Region	Year						
	1999	2000	2001	2002	2003	2004	2005
North Atlantic	\$3.45	\$3.87	\$4.67	\$3.47	\$3.33	\$4.06	\$3.78
Mid Atlantic	\$3.47	\$3.67	\$3.53	\$3.25	\$2.97	\$3.37	\$3.70
South Atlantic	\$3.27	\$3.24	\$3.43	\$3.14	\$3.26	\$3.52	\$3.80
Gulf of Mexico	\$3.35	\$3.25	\$3.31	\$2.91	\$2.95	\$3.31	\$3.44
All Regions	\$3.38	\$3.51	\$3.74	\$3.20	\$3.13	\$3.57	\$3.71

6.3 Variable Costs and Net Revenues

In 2003, NMFS initiated mandatory cost-earnings reporting for selected vessels to improve the economic data available for all HMS fisheries. In the past, most of the studies regarding pelagic longline variable costs and net revenues that were available to NMFS analyzed older data from 1996 and 1997. The HMS FMP provides a summary of several past studies on the variable costs and net revenues of longline fleets.

An analysis of the 2004 HMS logbook cost-earnings data provides updated information regarding the costs and revenue of a cross section of vessels operating in the HMS fisheries. The data contains a total of 579 trips taken by 51 different vessels. As described in Larkin et al. (2000), median values are reported. Median gross revenues per trip for 2004 were approximately \$12,112. Median total costs per trip were \$4,345 (compared to \$3,320 in the Larkin et al. (2000) study), with fuel costs making up \$567 (13 percent) of those costs. Median net revenue in this sample was \$6,728 per trip (compared to \$8,624 in the Larkin et al. (2000) study). The typical trip was nine days long and involved six sets. The median number of crew was three and the average share paid to crew was 11 percent of net revenue (\$740 per trip). The captain's share of net revenue was 20 percent (\$1,346) and the owner's share was reported to be 50 percent (\$3,364). The 2004 cost earnings information is similar to the findings of the 1996 study, but gross revenues appear to be lower than the Porter et al. (2001) study of 1997 operations.

6.4 Expected Economic Impacts of the Alternatives Considered

NMFS considered four alternatives and analyzed three of these alternatives for conducting scientific research experiments using pelagic longline gear in the East Florida Coast and Charleston Bump closed areas of the Atlantic Ocean. These four alternatives include: Alternative 1, not conducting research with PLL vessels in the Charleston Bump or East Florida Coast closed areas; Alternative 2, conducting year-round research with PLL vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the East Florida Coast closed area seaward of the axis of the Gulf Stream and north of 30 degrees N. Latitude; Alternative 3, conducting year-round research with PLL vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the East Florida Coast closed area seaward of the axis of the Gulf Stream and north of 28 degrees N. Latitude; and Alternative 4, conducting year-round research with PLL vessels throughout the entire Charleston Bump and East Florida Coast closed areas. Alternative 4 was considered but not further analyzed due to the extensive comment previously received expressing concern about the impact of conducting a research fishery in areas that are heavily utilized by recreational fishermen. The following sections below discuss the economic impacts of the various alternatives considered.

Alternative 1

Alternative 1 considers maintaining the status quo by not conducting research with PLL vessels in the Charleston Bump or East Florida Coast closed areas and maintaining existing regulations, which prohibit pelagic longline fishing in those closed regions. This alternative would result in no

change to the existing economic baseline conditions. It would continue existing adverse social or economic impacts of the current time and area closures for pelagic longline fishermen. These adverse economic impacts include lost revenues from decreased landings and additional expenditures for fuel by forcing some fishermen to increase steaming time to the fishing grounds. Increase steaming time has a negative social impact by forcing fishermen to be away from port for longer periods of time. Alternative 1 would maintain the existing socio-economic benefits that accrue to the recreational fishing sector, including the charter/headboat fleet, as result of the current time-area closures, by avoiding commercial/recreational gear conflicts and competition for fish between sectors. This alternative foregoes the possibility to increase information regarding the potential to reduce bycatch through gear modifications. Improved information regarding bycatch reduction in closed areas is economically valuable in that it could lead to changes regarding the restrictions currently required for closed areas. Improved information leading to more flexible regulation of the closed areas could allow for greater flexibility in fishing effort and thus potentially increasing net revenues by decreasing operating costs and/or increasing catch per unit effort.

Alternative 2

Alternative 2 may have minimal positive socio-economic impacts for the commercial pelagic longline sector by potentially allowing a limited number of vessels minor increases in landings and potentially decreasing fuel and other expenditures and reducing time away from port as a result of decreased steaming time. Additional minimal positive social and economic benefits may be realized by processors, wholesalers, and dealers in Florida or South Carolina, depending upon where the catch is offloaded. The proposed research areas are located within existing time/area closures that have been closed to PLL fishing since early 2001. A limited number of vessels are proposed to participate in the research, and although they would be allowed to retain any legal-sized tunas and swordfish, the goal of the research is not to increase harvests but rather to collect scientifically valid information on catch and bycatch rates within the closed areas.

The projected number of swordfish and tunas to be caught for research purposes is not likely to have a substantial economic or social impact. According to the estimates in Table 4.3, 1,232 swordfish would potentially be landed in the from the proposed research areas. NMFS would allow the sale of targeted species in order to facilitate participation and to provide a financial incentive for vessels to conduct the research. Without an incentive, and without any other form of compensation to cover the cost of fuel, gear, bait, ice, and crew, it is unlikely that vessels would be willing to participate the research. Thus, although a limited number of swordfish and tunas may be sold as a result of the research, it is unlikely to have a social or economic impact on small businesses or communities.

There is a potential to create incentives for future cooperative research ventures between regulatory agencies and industry representatives if such research is perceived as useful for reducing bycatch in areas where regulatory discards are high. If the information gained is transferred to other countries with similar concerns regarding transboundary species, there could be significant ecological benefits. While administrative costs to the agency are higher, in terms of monitoring (i.e., 100% observer coverage as a term and condition of permit) and enforcing exempted fishing activities under Alternatives 2 and 3 and 4, the benefits gained from

technological advances in bycatch and bycatch mortality reduction, both to the fishery and to the regulatory agency, far out way the costs administrative costs incurred.

Alternative 3

As with Alternative 2, Alternative 3 may also have minimal positive socio-economic impacts for the commercial pelagic longline sector by potentially allowing two vessels minor increases in landings and potentially decreasing fuel and other expenditures and reducing time away from port as a result of decreased steaming time. Additional minimal positive social and economic benefits may be realized by processors, wholesalers, and dealers in Florida or South Carolina, depending upon where the catch is offloaded

There are likely to be perceived adverse socio-ecological impacts to recreational fishing community. Negative social impacts associated with conducting this research may occur in communities with high numbers of recreational anglers who target swordfish and tunas. Many anglers believe, correctly or not, that even a limited return of PLL fishing in a strictly controlled setting will harm recreational catches. Regardless of actual impacts, which are anticipated to be minimal, this action will likely be perceived to negatively impact recreational fishing. The East Coast of Florida is the primary area that would be sensitive to any potential impacts on the recreational fishing sector given the large recreational fishing presence in that location. In previous requests for EFPs in this region, NMFS has received substantial opposition from the recreational sector. NMFS anticipates that concerns may be partially mitigated due to the strictly controlled experimentation and NMFS oversight

Alternatives 3 would also not result in any significant social or economic impacts. The Charleston Bump proposed research area in Alternative 3 is identical to that of Alternative 2. Therefore the economic impacts of the proposed Charleston Bump research area are identical to that of Alternative 2.

The only difference between this preferred alternative and Alternative 2 is that the proposed research area in the EFC would extend further south than under Alternative 2. Under Alternative 2 this EFC research area would extend to the 30 degrees North Latitude, and under Alternative 3 it would extend to 28 degrees North Latitude.

The projected number of swordfish and tunas to be caught for research purposes is not likely to have a substantial economic or social impact. According to the estimates in Table 4.3, 1,047 swordfish would potentially be landed in the from the proposed research areas. This is slightly lower than under Alternative 2, due primarily to lower average catch rates for swordfish in this proposed research area. In addition, both alive and dead discards of swordfish are also lower in this proposed area. Yellow fin tuna landings are estimated to be slightly higher under Alternative 3 (348) versus Alternative 2 (312). Dead of yellowfin tuna and bluefin tuna are estimated to also be slightly lower under Alternative 3 (See Table 4.3). NMFS would allow the sale of targeted species in order to facilitate participation and to provide a financial incentive for vessels to conduct the research.

Alternative 4

Alternative 4, to conduct research throughout the EFC and Charleston Bump closed areas was considered but not further analyzed. NMFS has received comments in the past that fishing in certain areas of the EFC, particularly south of Fort Pierce, FL where a large number of recreational fishermen target swordfish and other HMS, would be socially and economically disruptive. Estimating the economic impacts of potentially diminished recreational trips due to commercial vessels participating in a research fishery would be extremely difficult due to the limited duration of the research, variable fishing patterns of recreational anglers, lack of data on the number, location and duration of recreational trips, and the relatively low probability of encounters between recreational vessels and the limited number of vessels that would participate in this larger proposed research area. For these and other reasons, NMFS has not selected this alternative, and instead opted for the more focused research in smaller portions of the EFC and Charleston Bump where any social and economic impacts would be minimized.

7.0 REGULATORY IMPACT REVIEW

The Regulatory Impact Review (RIR) is conducted to comply with Executive Order 12866 (E.O. 12866) and provides analyses of the economic benefits and costs of each alternative to the nation and the fishery as a whole. Certain elements required in an RIR are also required as part of an environmental assessment (EA). Thus, this section should be considered only part of the RIR; the rest of the RIR can be found throughout this document.

7.1 Description of the Management Objectives

Please see Chapter 1 for a description of the objectives associated with this management action.

7.2 Description of the Fishery

Please see Chapter 3 and the Final Consolidated HMS FMP (NMFS, 2006) for a description of the fisheries that could be affected by this proposed scientific research.

7.3 Statement of the Problem

Please see Chapter 1 for a description of the problem and need for this proposed scientific research.

7.4 Description of Each Alternative

Please see Chapter 2 for a summary of each alternative and Chapter 4 for a complete description of each alternative and its expected ecological, social, and economic impacts. Chapter 6 provides additional information related to the impacts of the alternatives.

7.5 Economic Analysis of Expected Effects of Each Alternative Relative to the Baseline

Please see Chapters 4 and 6 for a complete description of the economic impacts of the alternatives. NMFS believes that the net national benefits associated with the proposed scientific

research would likely outweigh the costs associated with operating a research fishery given the limited number of participating vessels. Scientific information garnered from this research could lead to advances in bycatch and bycatch mortality reductions. There will also be limited net economic benefits associated with the sale of targeted species landed during the limited number of research trips. While the administrative costs to the agency are higher in terms of monitoring (*i.e.*, 100% observer coverage) the potential benefits are positive (Table 7.1).

Table 7.1 Net Economic Benefits and Costs for each Alternative.

Alternatives	Net Economic Benefits	Net Economic Costs
Alternative 1 -Do not conduct research with PLL vessels in the Charleston Bump or East Florida Coast closed areas (No Action)	Continuing high levels of recreational participation due to rebuilt swordfish population and lack of competition for resource and access to fishing grounds.	Continuation of reduced revenues for PLL sector from decreased landings of swordfish and continuing expenditures due to extended steaming time to reach open fishing grounds.
Alternative 2 -Conduct year-round research with PLL vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the East Florida Coast closed area seaward of the axis of the Gulf Stream and north of 30 degrees N. Latitude	Potential minor increases in revenues for a limited number of PLL vessels based on possible limited increases in landings of swordfish, and decreased expenditures on fuel due to reduced steaming time. Potential minor increases in revenues for fish houses, supply houses, and other dockside businesses that outfit PLL vessels. Limited net economic benefits associated with the sale of targeted species landed during the limited number of research trips. Scientific information garnered from this research could lead to advances in bycatch and bycatch mortality reductions.	Perceived loss of fishing opportunities by recreational sector could lead to minor decreases in recreational swordfish trips and booking of swordfish charter trips. Loss of actual fishing opportunities are unlikely to be realized. Very limited potential for economic losses associated with gear conflicts with recreational fishermen targeting swordfish and other HMS species. Agency costs associated with observer coverage and enforcement of exempted fishing activities.
Alternative 3 - <i>Conduct year-round research with PLL vessels in the Charleston Bump closed area seaward of the 200 m isobath and in the East Florida Coast closed area seaward of the axis of the Gulf Stream and north of 28 degrees N. Latitude - Preferred Alternative</i>	Same as above. Limited net economic benefits associated with the sale of targeted species landed during the limited number of research trips. Scientific information garnered from this research could lead to advances in bycatch and bycatch mortality reductions.	Same as above. Slightly higher potential for socioeconomic losses associated with gear conflicts with recreational fishermen targeting swordfish and other HMS species due to slightly larger and more southern extent of the proposed research area. Agency costs associated with observer coverage and enforcement of exempted fishing activities.

7.6 Summary

Under E.O. 12866, a regulation is a “significant regulatory action” if it is likely to: (1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; and (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the legal mandates, the President’s priorities, or the principles set forth in the Executive Order. The selected alternative described in this document does not meet the above criteria. Therefore, under E.O. 12866, the selected alternative described in this document has been determined to be not significant for the purposes of E.O. 12866. A summary of the expected net economic benefits and costs of each alternative, which are based on supporting text in Chapters 4 and 6, can be found in Table 13.

8.0 COMMUNITY PROFILES

This chapter serves as a brief overview and determination of the social impacts associated with the research action. A more comprehensive review of community profiles for all HMS fisheries can be found in Section 9 of the Final Consolidated HMS FMP (NMFS, 2006).

8.1 Introduction

Mandates to conduct social impact assessments come from both the NEPA and the Magnuson-Stevens Act. NEPA requires federal agencies to consider the interactions of natural and human environments by using a “systematic, interdisciplinary approach, which would ensure the integrated use of the natural and social sciences... in planning and decision-making” (§102(2)(A)). Moreover, agencies need to address the aesthetic, historic, cultural, economic, social, or health effects, which may be direct, indirect, or cumulative. Consideration of social impacts is a growing concern as fisheries experience increased participation and/or declines in stocks. With an increasing need for management action, the consequences of these actions need to be examined in order to mitigate the negative impacts experienced by the populations concerned.

Social impacts are generally the consequences to human populations that follow from some type of public or private action. They may include alterations to the ways people live, work or play, relate to one another, and organize to meet their needs. In addition, cultural impacts, which may involve changes in values and beliefs that affect people’s way of identifying themselves within their occupation, communities, and society in general, are included under this interpretation. Social impacts analyses help determine the consequences of policy action in advance by comparing the status quo with the projected impacts.

NMFS does not anticipate that this action will result in significant social impacts. In fact, there may likely be some positive social impacts as a result of NMFS conducting this cooperative research, and a potential minor increase in swordfish and other HMS species landings which could result in positive impacts for some communities. Table 8.1 shows the number and percentage of commercial swordfish permit holders by state. The five states that have the highest number of

directed and/or incidental swordfish permit holders are Florida, New Jersey, Louisiana, Massachusetts, and New York. Of these states, Florida and South Carolina are the closest to the areas where research fishing will be conducted. Some positive impacts may be realized by processors, wholesalers, and dealers in these areas depending upon where the catch is offloaded. Negative social impacts associated with conducting this research may occur in communities with high numbers of recreational anglers who target swordfish and tunas. Negative social impacts are possible as this research will be conducted aboard commercial vessels which will be setting pelagic longline gear and harvesting HMS. Regardless of actual impacts, this action will likely be perceived to negatively impact recreational fishing. The East Coast of Florida is one of the regions that would be sensitive to any potential impacts on the recreational fishing sector. In previous requests for EFPs in this region, NMFS has received substantial opposition from the recreational sector. Some of this concern may be mitigated due to the strictly controlled experimentation and NMFS oversight.

Table 8.1 Number and Percentage of Commercial Swordfish Permit Holders by State as of February 2006.

Commercial Swordfish Permits		
State	Total	%
Florida	117	32.4%
New Jersey	50	13.9%
Louisiana	43	11.9%
Massachusetts	33	9.1%
New York	29	8.0%
Rhode Island	27	7.5%
North Carolina	20	5.5%
Maryland	7	1.9%
South Carolina	7	1.9%
Texas	7	1.9%
Virginia	5	1.4%
Maine	4	1.1%
Alabama	3	0.8%
California	2	0.6%
Connecticut	2	0.6%
Mississippi	2	0.6%
Delaware	1	0.3%
New Hampshire	1	0.3%
Virgin Islands	1	0.3%
Grand Total	361	100%

8.2 State and Community Profiles

Section 9.4 of the Consolidated HMS FMP provides a comprehensive summary of the states and communities that participate in HMS fisheries and are affected by HMS regulations.

9.0 OTHER CONSIDERATIONS

9.1 National Standards

The analyses in this document are consistent with the National Standards (NS) set forth in the 50 CFR part 600 regulations.

This action would be consistent with NS 1 in that the proposed exempted fishing activities are part of a scientific research plan to evaluate pelagic longline catches and catch rates of target and non-target species within areas currently closed to pelagic longline gear; thus facilitating management efforts to prevent overfishing of HMS in the Atlantic Ocean. Additionally, the fish caught as a result of this exempted fishing activity would be counted against the appropriate quotas, which are consistent with rebuilding plans for those species. The alternatives considered are based on the best scientific information available (NS 2), including stock assessment, observer, and logbook data, which provide for the management of the species throughout their ranges (NS 3). The alternatives considered do not discriminate against fishermen in any state (NS 4) nor do they alter the efficiency in utilizing the resource (NS 5). With regard to NS 6, the alternatives take into account variations that have occurred in the fishery and the fishery resource, due to both regulation and improved stock status, and analyze the effects of shifting a limited amount of fishing effort to collect scientific data. Additionally, NMFS considered the costs and benefits of the various alternatives both economically and socially under NS 7 and 8 in Chapters 4, 6, and 7 of this document. The alternatives considered would evaluate pelagic longline catches and catch rates of target and bycatch species within areas currently closed to pelagic longline gear (NS 9). Finally, the alternatives considered would not require fishermen to fish in an unsafe manner (NS 10).

9.2 Paperwork Reduction Act

This action does not contain any new collection-of-information requirements for purposes of the Paperwork Reduction Act.

9.3 Federalism

This action does not contain regulatory provisions with federalism implications sufficient to warrant preparation of a Federalism Assessment under E.O. 13132.

10.0 LIST OF PREPARERS

A team of individuals prepared this document from the Highly Migratory Species Management Division, Office of Sustainable Fisheries (F/SF1), NMFS, including

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11.0 LIST OF AGENCIES AND PERSONS CONSULTED

Discussions pertinent to formulation of the proposed exempted fishing activities involved input from a variety of scientific and constituent interest groups including the commercial, recreational fishermen, environmental advocates, and staff from the NMFS and the NOAA General Counsel for Fisheries.

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