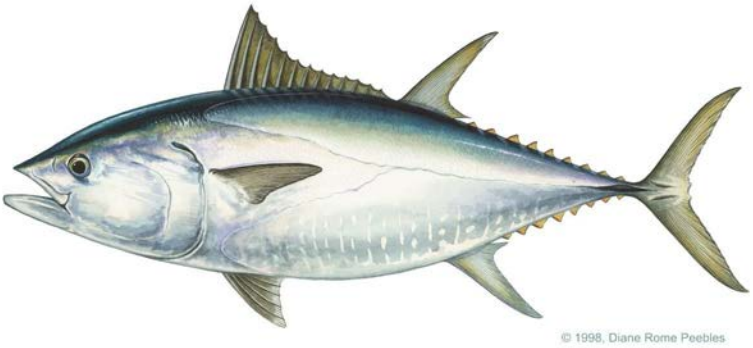
FINAL REGULATORY AMENDMENT TO MODIFY PELAGIC LONGLINE BLUEFIN TUNA AREA-BASED AND WEAK HOOK MANAGEMENT MEASURES

Including:
A Final Environmental Impact Statement,
A Final Regulatory Impact Review,
A Final Regulatory Flexibility Analysis, and
A Final Social Impact Analysis



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Final Regulatory Amendment to Modify Pelagic Longline Bluefin Tuna Area-Based and Weak Hook Management Measures

Abstract: Through this rulemaking process, the National Marine Fisheries Service (NMFS) considers whether all of the current area-based and gear management measures implemented to reduce bluefin tuna catch in the pelagic longline fishery for Atlantic highly migratory species (HMS), are still necessary to continue to achieve relevant management objectives. This evaluation is necessary given the shift in focus of managing bluefin tuna bycatch in the pelagic longline fishery from fleet-wide management measures to individual vessel accountability for incidental catch in the pelagic longline fishery; the continued underharvest of quotas in the associated target fisheries, particularly the swordfish quota; comments from the public and HMS Advisory Panel members indicating that having multiple regulations intended to accomplish the same objective regarding limiting bycatch may be overly restrictive of the pelagic longline fishery; and requests from the public and HMS Advisory Panel members to reduce regulatory burden and remove duplicative regulations. As part of ongoing efforts to continue to appropriately conserve and manage Atlantic HMS, including bluefin tuna, consistent with established quotas and management objectives, NMFS takes these actions to: (1) continue to appropriately limit incidental catch of bluefin tuna in the pelagic longline fishery and to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna by pelagic longline gear; 2) simplify and streamline Atlantic HMS management; and (3) optimize the ability of the pelagic longline fishery to harvest target species quotas (*e.g.*, swordfish).

Proposed Actions: Undertake a review process to collect and review data to evaluate the continued need for the Northeastern United States Closed Area and the Gulf of Mexico Gear Restricted Area; remove the Cape Hatteras Gear Restricted Area; adjust the Gulf of Mexico gear requirements to shorten the duration of required weak hook use from year-round to seasonal (January - June) to relieve regulatory burden and reduce bycatch of white marlin and roundscale spearfish.

Statement Type: Final Environmental Impact Statement; Final Regulatory Impact Review; Final Regulatory Flexibility Analysis; Final Social Impact Statement

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Executive Summary

Through this rulemaking process, the National Marine Fisheries Service (NMFS) considers whether current regulations are still necessary to achieve conservation and management objectives for the pelagic longline fishery related to limiting incidental catch of bluefin tuna during directed fishing for other species. Over time, NMFS has adopted a suite of measures to reduce bluefin tuna interactions in the pelagic longline fishery, including mandatory weak hook use, time/area closures, gear restricted areas, and electronic monitoring and the IBQ Program adopted in 2015 through Amendment 7 to the 2006 Consolidated HMS FMP. With this suite of measures now in place, quotas for target species have continued to be significantly underharvested and available IBQ allocation remains unused at the end of each year, indicating that all of the measures in tandem may not be necessary to appropriately limit incidental catch of bluefin tuna in the pelagic longline fishery and may not best achieve other management objectives, such as allowing fishermen a reasonable opportunity to harvest available quotas. Thus, this action examines whether all of the measures to limit such incidental catch remain needed and proposes certain changes to the management regime. The changes will continue to ensure that conservation obligations are met, but in a way that is not unnecessarily restrictive of pelagic longline fishery effort.

Atlantic highly migratory species (HMS) fisheries are managed under the dual authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and the Atlantic Tunas Convention Act (ATCA). Under the Magnuson-Stevens Act, NMFS must, consistent with ten National Standards, manage fisheries to maintain optimum yield on a continuing basis while preventing overfishing. ATCA authorizes the Secretary of Commerce (Secretary) to promulgate regulations, as may be necessary and appropriate to carry out recommendations of the International Commission for the Conservation of Atlantic Tunas (ICCAT). The authority to issue regulations under the Magnuson-Stevens Act and ATCA has been delegated from the Secretary to the Assistant Administrator for Fisheries. The measures proposed in this amendment and associated rulemaking are taken under the authority of the Magnuson-Stevens Act and ATCA. Currently, Atlantic sharks, tunas, swordfish, and billfish are managed under the 2006 Consolidated Atlantic HMS Fishery Management Plan (2006 Consolidated HMS FMP) and its amendments.

The implementation of Amendment 7 to the 2006 Consolidated HMS FMP (79 FR 71510; December 2, 2014)(Amendment 7) in 2015 shifted the focus of managing bluefin tuna bycatch in the HMS pelagic longline fishery from fleet-wide management measures to individual vessel accountability for such bycatch through the implementation of a bluefin tuna catch share program (i.e., the Individual Bluefin Quota, or IBQ, Program). The results of a formal Three-Year Review of the IBQ Program indicate that the IBQ Program has met or exceeded expectations for most of its objectives, including successfully reducing bluefin tuna dead discards in the pelagic longline fishery. NMFS concluded that the substantial reductions in total bluefin bycatch were evidence of the effectiveness of the regulatory incentives to avoid bluefin tuna inherent in the IBQ Program. NMFS was able to successfully balance achieving the IBQ Program objectives with impacts on the permit categories authorized to target bluefin tuna and on HMS dealers by addressing previous problems with bluefin tuna pelagic longline category quota overages. The IBQ Program also balanced the objective of limiting bluefin catch with the objective of optimizing fishing opportunities, and maintaining profitability was achieved in the context of the IBQ Program. However, effort, as defined by number of vessels fishing with pelagic longline gear, trips, sets, and hooks within the pelagic longline fishery, has continued to decrease. In addition, quotas established for target species (e.g., swordfish) are still not being met despite a tailored program of fishery revitalization that has been underway since 2007.

Since implementation of Amendment 7 management measures, NMFS has received comments from pelagic longline fishery participants and other interested parties suggesting that NMFS should examine whether some fleet-wide measures such as gear requirements, area restrictions, or time/area closures are still necessary to reduce bluefin tuna bycatch and still meet the objectives of the 2006 Consolidated HMS FMP and its amendments. In other words, there are concerns that because the IBQ Program has been successful in reducing bluefin bycatch in the pelagic longline fishery, certain other regulations may no longer be needed, especially given that science-based quotas or other limits designed to appropriately conserve stocks are left unfilled, both for bluefin tuna and for target species such as swordfish. Commenters (including the public and HMS Advisory Panel members) specifically requested that NMFS evaluate and potentially reduce regulatory burden or remove regulations that may be redundant or unnecessarily restrictive of the pelagic longline fishery in conjunction with the IBQ Program.

On March 2, 2018 (83 FR 8969), NMFS published a scoping document that evaluated management options for three spatially managed areas and gear-based regulations, all of which were implemented with the objective of reducing bluefin tuna dead discards or interactions. NMFS received approximately 275 unique comments during the public scoping period (March 2, 2018 through May 1, 2018). Comments were received that were both in support of and opposed to changes in the regulations. Additionally, comments included three letter writing campaign batch submissions that totaled 13,444 form letters, most of which were opposed to any management changes in the Gulf of Mexico out of concern for protecting spawning bluefin tuna, given that the North Atlantic stock's only known spawning grounds are in the Gulf of Mexico.

After considering feedback from the HMS Advisory Panel and all of the public comments received during the scoping period, NMFS published a DEIS (84 FR 22492; May 17, 2019) that identified and analyzed 14 alternatives. NMFS received comments on the DEIS at the Spring 2019 HMS Advisory Panel meeting. NMFS published a proposed rule that contained the same alternatives, including the same preferred alternatives (84 FR 33205; July 12, 2019). NMFS subsequently published a correction notice (84 FR 38918; August 8, 2019) to address some minor errors in the description of two preferred alternatives, and a notice announcing an additional hearing in Gloucester, MA (84 FR 45734; August 30, 2019). Public comments on the proposed rule and DEIS were accepted through September 30, 2019. Public comments and NMFS responses are summarized in Appendix F.

Consistent with the regulations published by the Council on Environmental Quality, 40 C.F.R. 1501-1508 (CEQ Regulations), in this Final Environmental Impact Statement (FEIS), NMFS has identified preferred alternatives to meet the purpose and need of the action. A full description and analysis of the different alternatives can be found in Chapters 2 and 4 of this FEIS. We have identified preferred alternatives that would adjust conservation and management measures consistent with domestic and international management objectives for bluefin tuna and the pelagic longline fishery. These preferred alternatives would also be in furtherance of the Department of Commerce strategic plan objectives to review agency regulations and remove or modify rules that unnecessarily burden businesses and economic growth. The preferred alternatives in this FEIS are mostly unchanged from those in the DEIS, with one clarifying addition to the closure thresholds identified for the Spring Gulf of Mexico Monitoring Area and the Northeastern United States Monitoring Area.

The preferred alternatives for these monitoring areas would undertake an evaluation to collect and review data, to evaluate the continued need for the areas. Pelagic longline fishing would be allowed in the areas provided total catch (landings and dead discards) remains under an established threshold, measured by the amount of IBQ allocation used to account for bluefin catch in the area. For the Spring Gulf of Mexico Monitoring Areas, the threshold in the DEIS was 63,150 lb of Gulf of Mexico IBQ allocation. This threshold is approximately 55 percent of the total amount of Gulf of Mexico IBQ annual allocation issued to the fleet in 2018. A clarifying modification was made to the preferred alternative in

the FEIS in response to a public comment. The same threshold of 63,150 lb is retained, with a clarifying addition addressing what would happen if the ICCAT western Atlantic bluefin tuna quota and U.S. allocation of that quota were to decrease in the future. The FEIS specifies that if the ICCAT quota is adjusted downward, the threshold would also be adjusted downward, to reflect a percentage of overall IBQ allocation commensurate with the current threshold (i.e., 55 percent of the new Gulf of Mexico IBQ allocation disbursed to the fleet, the equivalent percentage of the current threshold in relation to the overall available IBQ allocation). Any other relevant changed conditions (related to stock status for example) would also appropriately be taken into consideration at that time. If the ICCAT quota increases, the threshold would remain the same, to minimize risks associated with uncertainty concerning the ecological impacts of allowing pelagic longline fishing in these areas.

Similarly, the threshold for the Northeastern United States Monitoring Area identified in the DEIS would remain the same unless the ICCAT quota were later adjusted downward. As with the Spring Gulf of Mexico Monitoring Area, if the ICCAT quota were to be reduced and the United States' share with it, the threshold would also be adjusted. For the Northeastern United States Monitoring Area, the threshold in the DEIS was 150,519 lb of IBQ allocation used to cover catch from sets made within the boundaries of the Monitoring Area. The 150,519 lb threshold is equivalent to 72 percent of the Atlantic IBQ allocation issued to the fleet in 2018. In the FEIS, the same threshold of 150,519 lb is retained, with a clarifying addition to address what would happen if the ICCAT western Atlantic bluefin tuna quota and U.S. allocation of that quota decreases in the future. The FEIS specifies that if the ICCAT quota is adjusted downward, the threshold would also be adjusted downward, to reflect the percentage of overall IBQ allocation commensurate with the current threshold (i.e., 72 percent of the new Atlantic IBQ allocation disbursed to the fleet, the equivalent percentage of the current threshold in relation to the overall available IBQ allocation). If the ICCAT quota increases, the threshold would remain the same, to minimize risks associated with uncertainty concerning the ecological impacts of allowing pelagic longline fishing in these areas.

Another minor change that has been made from the DEIS to this FEIS concerns the timing of inseason closure notices that could occur in response to thresholds being met for the Northeastern United States Monitoring Area and the Spring Gulf of Mexico Monitoring Area. NMFS originally noted in the DEIS in the description of the preferred alternatives that "*If no closure notice is filed between January 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action.*" Since the thresholds are not cumulative in nature with respect to IBQ allocation use by the pelagic longline fishery to account for landings and dead discards, the design of this process would not necessitate an inseason closure to be filed until after the respective start dates for monitoring., (i.e., after April 1, 2020 for the Spring Gulf of Mexico Monitoring Area or June 1, 2020 for the Northeastern United States Monitoring Area). NMFS is adjusting the timeframe in the preferred alternative to reflect this clarification.

A full description and analysis of the different alternatives can be found in Chapters 2 and 4 of this document. The list of preferred alternatives can be found below (Table 0.1); the list of the full range of alternatives considered can be found in Chapter 2. The cumulative ecological impacts of the preferred alternatives are expected to be minor and beneficial, while the socioeconomic impacts are expected to be minor and adverse.

The CEQ regulations direct Federal agencies, to the full extent possible, to integrate the requirements of NEPA with other planning and environmental review procedures required by law or by agency practice so that all procedures run concurrently rather than consecutively. To that end, this document integrates the FEIS required by NEPA with the fisheries planning and management requirements associated with the final amendment to an FMP under the Magnuson-Stevens Act, the Final Regulatory Flexibility Analysis required under the Regulatory Flexibility Act, 5 U.S.C. §§ 601-603; and the Regulatory Impact Review prepared in accordance with Executive Order 12866, "Regulatory Planning and Review."

Table 0.1 Preferred Alternatives in the DEIS and FEIS for Pelagic Longline Bluefin Tuna Area-Based and Weak Hook Management Measures

Alternative Topic	Preferred Alternative in DEIS	Preferred Alternative in FEIS
Northeastern United States Closed Area	*Alternative A4* Undertake a review process to evaluate the continued need for the Northeastern United States Pelagic Longline Closure.	*Alternative A4* Undertake a review process to evaluate the continued need for the Northeastern United States Pelagic Longline Closure. Includes a provision to ensure that the threshold for closure of the area effectively remains the same (percentage-wise) in the event that the U.S. allocation of bluefin tuna is reduced at a future ICCAT meeting.
Reason for Change: A clarifying addition is made to this alternative after consideration of public comment. NMFS received a suggestion that the threshold at which this monitoring area closes be based on a percentage of the total Atlantic IBQ allocation issued annually rather than a hard number, in the event that the U.S. western Atlantic bluefin tuna allocation is adjusted at a future ICCAT meeting. The next stock assessment for bluefin tuna is currently scheduled by ICCAT for 2020. To ensure that threshold amount adequately serves as a threshold and is not disproportionately large, the alternative clarifies that if the ICCAT quota and U.S. allocation are reduced, the threshold amount would also be reduced to a level commensurate with the current level. The current amount is equivalent to 72 percent of the Atlantic category IBQ annual allocation disbursed to the fleet each year. The reduction would ensure that the threshold remains at 72 percent of new total Atlantic IBQ annual allocation that results if ICCAT adopts a lower TAC for western Atlantic bluefin tuna. If the ICCAT quota is adjusted upwards, however, the IBQ allocation amount will not be adjusted upwards. A second clarification concerns the timing of inseason notices that could be filed in response to the threshold for this area being met. NMFS originally noted in the DEIS in the description of the preferred alternative that, "*If no closure notice is filed between January 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action.*" Since the thresholds are not cumulative in nature with respect to IBQ allocation use by the pelagic longline fishery to account for landings and dead discards, the design of this process would not necessitate an inseason closure to be filed until after the respective start dates for monitoring. NMFS is adjusting the preferred alternative to read, "*If no closure notice is filed between June 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action.*"		
Cape Hatteras Gear Restricted Area	*Alternative B2* Elimination of the Cape Hatteras Gear Restricted Area.	*Alternative B2* Elimination of the Cape Hatteras Gear Restricted Area.
Reason for Change: No change from the DEIS to the FEIS.		
Gulf of Mexico Gear Restricted Area	*Alternative C3* Undertake a review process to evaluate the continued need for the Spring Gulf of Mexico Gear Restricted Area.	*Alternative C3* Undertake a review process to evaluate the continued need for the Spring Gulf of Mexico Gear Restricted Area. Includes a provision to ensure that the threshold for closure of the area effectively remains the same (percentage-wise) in the event that the U.S. allocation of bluefin tuna is reduced at a future ICCAT meeting.

Reason for Change: A clarifying addition is made to this alternative after consideration of public comment. NMFS received a suggestion that the threshold at which at which this monitoring area closes be based on a percentage of total available Gulf of Mexico IBQ allocation issued annually rather than a hard number, in the event that the U.S. western Atlantic bluefin tuna allocation is adjusted downward at a future ICCAT meeting. The next stock assessment for bluefin tuna is currently scheduled by ICCAT for 2020. To ensure that the threshold amount adequately serves as a threshold and is not disproportionately large, the alternative clarifies that the threshold amount would also be reduced to a level commensurate with the current level. The current selected amount is equivalent to 55 percent of new total Gulf of Mexico IBQ annual allocation that results if ICCAT adopts a lower TAC for western Atlantic bluefin tuna. If the ICCAT quota is adjusted upwards, however, the IBQ allocation amount will not be adjusted upwards. A second clarification concerns the timing of inseason notices that could be filed in response to the threshold for this area being met. NMFS originally noted in the DEIS in the description of the preferred alternative that, "*If no closure notice is filed between January 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action.*" Since the thresholds are not cumulative in nature with respect to IBQ allocation use by the pelagic longline fishery to account for landings and dead discards, the design of this process would not allow for an inseason closure to be filed prior to the respective start dates for monitoring. NMFS is adjusting this statement to read, "*If no closure notice is filed between April 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action.*"		
Weak hooks	Alternative D2 Seasonal requirement for weak hooks.	Alternative D2 Seasonal requirement for weak hooks.
Reason for Change: No change from the DEIS to the FEIS.		

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1 Introduction

Atlantic highly migratory species[1] (HMS) are managed under the dual authority of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (Magnuson-Stevens Act) and the Atlantic Tunas Convention Act (ATCA). Under the Magnuson-Stevens Act, the National Marine Fisheries Service (NMFS) must, consistent with ten National Standards, manage fisheries to maintain optimum yield on a continuing basis while preventing overfishing. Under ATCA, the Secretary of Commerce is required to promulgate regulations as may be necessary and appropriate to carry out recommendations by the International Commission for the Conservation of Atlantic Tunas (ICCAT). The conservation and management measures proposed for this regulatory amendment and associated rulemaking, which address Western Atlantic bluefin tuna, are taken under the authority of the Magnuson-Stevens Act and ATCA. Management measures must also be consistent with other applicable laws including, but not limited to, the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), and the Coastal Zone Management Act (CZMA). This document is prepared, in part, to comply with our responsibilities under NEPA, as implemented by the regulations published by the Council on Environmental Quality, 50 C.F.R. Parts 1501-1508, and NOAA Administrative Order (NAO) 216-6A, compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands and its associated Companion Manual.

Pelagic longline is not an authorized gear for directed fishing on bluefin tuna, but bluefin tuna are caught as bycatch in the directed fishery while using pelagic longline gear to catch swordfish and other tunas. Over time, NMFS has implemented a number of management measures to reduce and monitor bluefin tuna dead discards in the pelagic longline fishery, including time-area closures and gear restrictions. In Amendment 7 to the 2006 Consolidated HMS FMP (79 FR 71510; December 2, 2014)(Amendment 7), comprehensive measures were adopted, including implementation of the Individual Bluefin Quota (IBQ) catch share program, establishment of pelagic longline gear restricted areas, mandatory retention of legal size bluefin tuna dead at haulback, removal of the requirement for certain levels of target catch landings as a condition for bluefin retention, electronic monitoring (EM), and vessel monitoring system (VMS) reporting. Since implementation of these measures in 2015, there has been a substantial drop in bluefin tuna interactions and dead discards in the pelagic longline fishery. Through this rulemaking, NMFS considers whether all of the area-based and gear based measures implemented to reduce bluefin tuna bycatch in the pelagic longline fishery are still needed to appropriately limit incidental bluefin tuna catch, given the success of the IBQ Program. Measures under consideration include the Northeastern United States Closed Area, Cape Hatteras Gear Restricted Area, Spring Gulf of Mexico Gear Restricted Area, and weak hook requirements in the Gulf of Mexico.

Based on further analyses and consideration of comments received on the scoping document, the draft environmental impact statement (DEIS), and the proposed rule, NMFS has developed this final environmental impact statement (FEIS). All of the alternatives that were included in the DEIS are

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[1]The Magnuson-Stevens Act, at 16 U.S.C. 1802(14), defines the term "highly migratory species" as tuna species, marlin (*Tetrapturus* spp. and *Makaira* spp.), oceanic sharks, sailfishes (*Istiophorus* spp.), and swordfish (*Xiphias gladius*)."

carried forward into this FEIS. A clarifying addition and one modification regarding timing has been made in two preferred alternatives (A4 and C3) based on consideration of public comment received on the proposed rule and DEIS. We note that a number of public comments on the proposed rule suggested that NMFS consider implementing new area-based management alternatives other than or in addition to those already established and under review in this rulemaking that would delineate areas in the Gulf of Mexico where weak hook use would and would not be required. As discussed in Appendix F (see Comment #29 and Comment #33, and corresponding analyses in Appendix D), NMFS has decided not to include these suggested area-based alternatives in the FEIS due to uncertain ecological benefits, enforceability and resource commitment concerns, and a lack of statistically significant data implicating the need for such management measures As NMFS collects more information on the fishery, NMFS may consider these suggestions in future rulemakings. A summary of the comments received and NMFS' responses can be found in Appendix F (Comments and Response to Comments Received Concerning the DEIS and Proposed Rule). All written comments can be found at https://www.regulations.gov/docket?D=NOAA-NMFS-2018-0035.

In the DEIS, NMFS noted that the ecological and social impacts of preferred alternatives were primarily analyzed with HMS logbook data collected by the agency between 2015 and 2017. However, NMFS also noted that updated data would be used as available in the FEIS stage. As discussed in greater detail in relevant chapters, NMFS has updated the information and analyses included in this FEIS with information that is collected under routine or established procedures, where available. For example, some data tables and figures in Chapter 3 have been updated to reflect new 2018 HMS logbook data. In some chapters, such as in Chapter 3, some of the data and tables reflect information provided in the 2018 Atlantic HMS Stock Assessment and Fishery Evaluation (SAFE) report. Data tables and figures from the 2018 SAFE are denoted either with footnotes indicating the data source, or from the reference "NMFS 2019" (note that publication date for the 2018 SAFE Report was in April 2019). In Chapter 4, NMFS has updated the ecological and socio-economic impacts analyses with 2018 HMS logbook data, where appropriate.

The alternatives in this FEIS would affect vessels permitted in the commercial Atlantic HMS pelagic longline fishery and are separated into two categories (area-based alternatives and weak hook alternatives) for ease of understanding. NMFS considered a range of alternatives for each category that would meet the purpose and need of this rulemaking. The alternatives are described in greater detail in Chapter 2 and Chapter 4.

1.1 Brief Management History and Public Feedback

The following is a brief overview of HMS management, focusing on management relevant to the spatial areas and gear restrictions covered under this rule.

1.1.1 Pelagic Longline Fishery Management Overview

The pelagic longline fishery for Atlantic HMS primarily targets swordfish, yellowfin tuna, and bigeye tuna in various areas and seasons. Secondary target species include dolphin, skipjack tuna, and albacore tuna. Although this gear can be modified (e.g., depth of set, hook type, hook size, bait) to target swordfish or tunas, it is generally a multi-species fishery. Pelagic longline vessel operators are opportunistic, switching gear style and making subtle changes to target the best available economic opportunity on each individual trip. Fishery participants must hold a shark, tuna, and swordfish limited access permit (LAP), i.e., a "triple pack", to reduce bycatch and regulatory discards. The permits were designed such that the tuna and swordfish LAPs were only valid if held

in conjunction with the other two types of LAPs. As of October 2017, approximately 280 Atlantic Tunas Longline category permits had been issued. In addition, based on the 2018 HMS SAFE Report, approximately 185 Swordfish Directed LAPs, 72 Swordfish Incidental LAPs, 221 Shark Directed LAPs, and 269 Shark Incidental LAPs had been issued (NMFS 2019). Many of the regulations associated with current spatially managed areas are triggered either by the assignment of a permit to a vessel or by having a particular gear type (e.g., pelagic longline) on board.

There are numerous regulations and restrictions applicable to the pelagic longline fishery. Participants must follow several reporting requirements implemented to support the IBQ program (discussed below); report landings; reduce and/or mitigate bycatch interactions; comply with hook and bait restrictions, some of which are spatially managed; use VMS to hail into or out of the fishery; comply with minimum size restrictions for target catch; and comply with species-specific restrictions that may be related to domestic or international management objectives. There are also a number of spatial restrictions for the pelagic longline fishery and Atlantic HMS commercial fisheries, which are summarized in the Atlantic HMS Commercial Compliance Guide (Figure 1.1). Some of these time/area closures were intended to reduce bycatch and protect critical areas (e.g., Florida East Coast Closure, DeSoto Canyon Closure, Northeast Canyons and Seamounts Marine National Monument, coral habitat areas of particular concern). Other spatial management measures were intended to protect and manage specific species, such as bluefin tuna, and are discussed in further detail below.

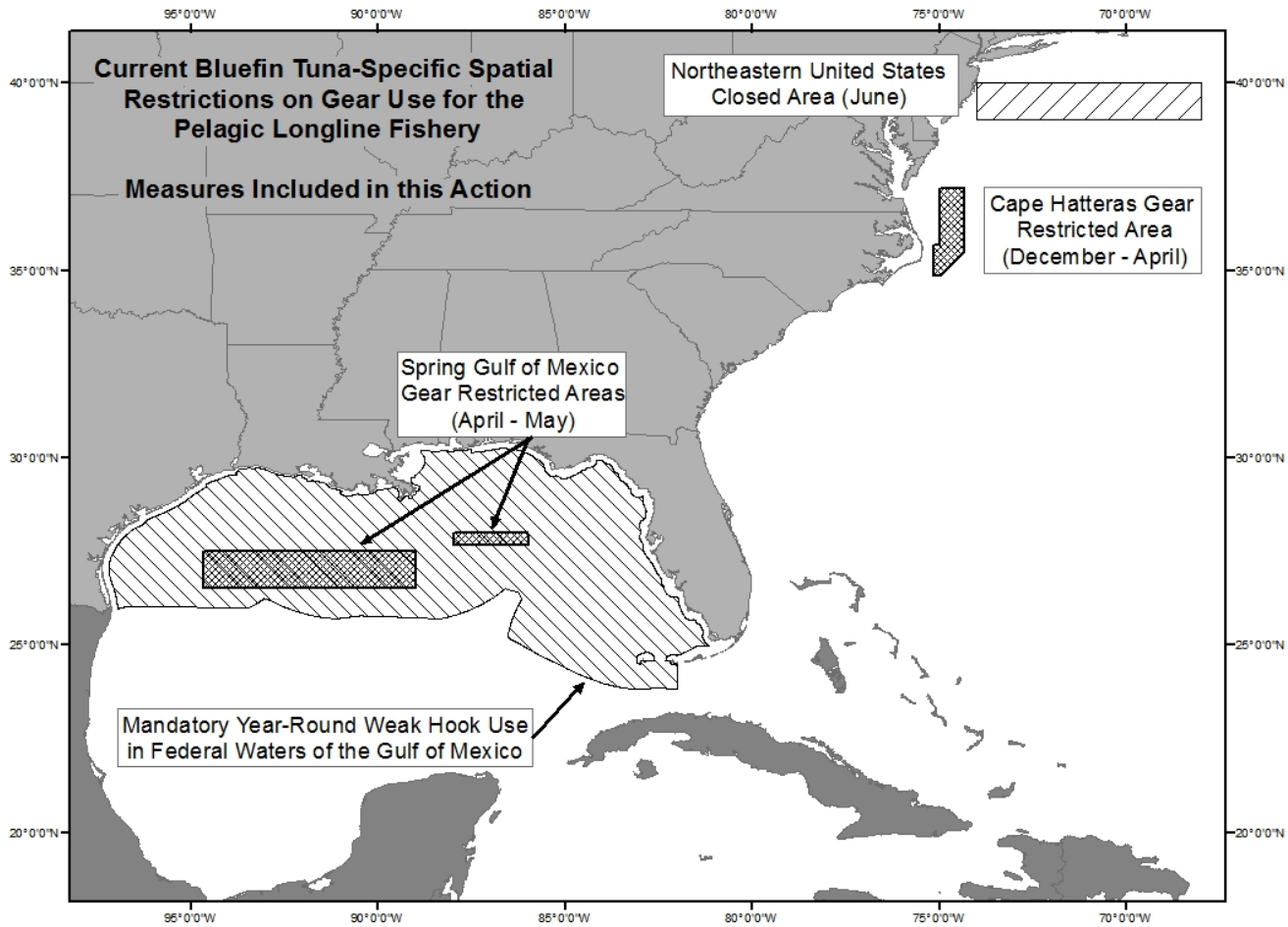

Figure 1.1 Map of bluefin tuna-specific spatial restrictions for the pelagic longline fishery in this action including the Northeastern U.S. Closed Area, Spring Gulf of Mexico and Cape Hatteras Gear Restricted Areas, and Affected Area for Weak Hooks

1.1.2 Pelagic Longline Spatial and Gear Management for Bluefin Tuna

NMFS has implemented a number of spatial management measures to meet various management strategies for bluefin tuna over the past 20 years. Some of these management measures were intended to reduce bluefin tuna dead discards (Northeastern United States Closed Area), while others were intended to reduce bluefin tuna interactions (gear restricted areas and weak hooks).

1.1.2.1 Northeastern United States Closed Area

The Northeastern United States Closed Area was implemented in 1999 to reduce bluefin tuna discards in the pelagic longline fishery (64 FR 29090; May 28, 1999).

NMFS determined that the western Atlantic bluefin tuna stock was overfished in 1997. In addition, a 1998 ICCAT Recommendation on western Atlantic bluefin tuna (Rec. 98-07) required that all Contracting Parties, including the United States, minimize dead discards of bluefin tuna to the extent practicable and set a country-specific dead discard allowance. Given the status of bluefin tuna and recommendations from ICCAT at that time, NMFS investigated a range of different time/area options for locations with high bluefin tuna bycatch through the rulemaking process for

the 1999 HMS FMP for Atlantic tunas, sharks, and swordfish (NMFS 1999). In the final rule for that FMP, NMFS implemented the Northeastern United States Closed Area based, in part, on a redistribution analysis (disbursement analysis in the FEIS) that showed that a closure during the month of June could reduce bluefin tuna live and dead discards by 55 percent in this area, without any substantial changes to target catch or other bycatch levels. This area, located off the coast of New Jersey (Figure 1.1), is now closed from June 1 through June 30 each year. Considerable effort has been occurring on the outer seaward edges of the closed area for the past 20 years. However, for most of that time, pelagic longline vessels could only retain 1 to 3 bluefin, dependent on meeting target catch requirements. When caught as bycatch in the directed fishery for swordfish and tunas, pelagic longline vessels were allowed to keep one bluefin tuna if 2,000 lb (907 kg) of target catch was onboard, two bluefin tuna if 6,000 lb (2,727 kg) of target catch was onboard, and three bluefin tuna if 30,000 lb (13,620 kg) of target catch was onboard. All other catch of bluefin above the number specified under target catch requirements had to be discarded, regardless of whether the fish were alive or dead.

NMFS considered changes to the Northeastern United States Closed Area within the range of potential options presented during the scoping process (April 23, 2012; 78 FR 24161) and Predraft for Amendment 7 to the 2006 Consolidated HMS FMP. No comments were received specific to the Northeastern United States Closed Area option during Amendment 7 scoping, but there was general support for reducing the size and time of pelagic longline closed areas where possible. During the rulemaking process for Amendment 7, NMFS also considered an alternative that would grant permitted vessels conditional access to closed areas provided they qualified under performance-based access criteria and took an observer on trips into those areas (including DeSoto Canyon, the East Florida Coast, Charleston Bump, and the Northeastern United States Closed Areas). Ultimately, as discussed further in the FEIS for Amendment 7, NMFS did not prefer the alternative for conditional access to closed areas based on the difficulty of determining the precise magnitude of ecological impacts in the context of other management measures, public comment indicating that conditional access did not achieve a proper balance of rulemaking objectives, and further consideration of potential administrative costs.

For this rulemaking, NMFS has developed analyses to consider potential changes or access to individual closed areas, rather than a collective approach for all areas. NMFS has also developed an evaluative mechanism to collect information in areas closed to pelagic longline fishery effort (and thus, fishery-dependent data collection). that would inform impact analyses in future rulemakings. Since the Northeastern United States Closed Area was implemented to reduce bluefin bycatch and dead discards, it is considered in this rule along with other areas intended to reduce bluefin bycatch and dead discards.

1.1.2.2 Cape Hatteras and Spring Gulf of Mexico Gear Restricted Area

Amendment 7 implemented several gear restricted areas to reduce pelagic longline bluefin tuna interactions, thereby decreasing the potential for dead discards, and to optimize fishing opportunity (NMFS 2014). The Cape Hatteras Gear Restricted Area, located off the coast of North Carolina, limits access by vessels from December 1 through April 30 annually. The Spring Gulf of Mexico Gear Restricted Area, which consists of two areas in the central and eastern Gulf of Mexico, limits access to pelagic longline gear from April 1 through May 31 annually. The Spring Gulf of Mexico Gear Restricted Area and the Cape Hatteras Gear Restricted Area were designed based on the identification of areas with relatively high bluefin interaction rates with pelagic longline gear (based on HMS logbook and observer data). The majority of interactions with bluefin tuna occurring in the Cape Hatteras Gear Restricted Area were limited to a few pelagic longline participants. Due to this dynamic, NMFS implemented performance measures to grant "qualified"

fishery participants access to the area. Access is granted if pelagic longline vessels have a low ratio of bluefin tuna interactions to designated species (i.e., swordfish, yellowfin tuna, bigeye tuna, pelagic sharks, dolphin, wahoo) landings, compliance with the pelagic observer program, and timely submission of logbooks. For the 2019-2020 effective period of the Cape Hatteras Gear Restricted Area, 70 out of 89 vessels evaluated were granted access to the area based on high bluefin avoidance and compliance scores. The Spring Gulf of Mexico Gear Restricted Area limits access to all vessels using pelagic longline gear, instead of being implemented with performance access, because the distribution of interactions was more widespread across both the geographic area (Gulf of Mexico) and fleet participants. In comparison, performance metrics were deemed more appropriate for the Cape Hatteras Gear Restricted Area given that high numbers of bluefin interactions in that area resulted from the fishing behavior of a small number of vessels.

1.1.2.3 Weak Hooks

From 2007-2010, NMFS conducted research on the use of weak hooks by pelagic longline vessels operating in the Gulf of Mexico to reduce bycatch of spawning bluefin tuna. Weak hooks are hooks that straighten to release large fish, such as bluefin tuna, when they are caught, while retaining smaller fish, such as swordfish and other tunas. Research results showed that the use of weak hooks can significantly reduce the amount of bluefin tuna caught by pelagic longline vessels. Some reductions in the amount of target catch of yellowfin tuna and swordfish were noted but were not statistically significant. In 2011, a large year class (2003) of bluefin tuna was approaching maturity and was expected to enter the Gulf of Mexico to spawn for the first time. Consistent with the advice of the ICCAT Standing Committee for Research and Statistics (SCRS) that ICCAT may wish to protect the strong 2003 year class until it reaches maturity and can contribute to spawning, and for other stated objectives, NMFS, in a final rule on Bluefin Tuna Bycatch Reduction in the Gulf of Mexico Pelagic Longline Fishery, implemented mandatory use of weak hooks on a year-round basis to reduce bycatch of bluefin tuna (76 FR 18653; April 5, 2011).

1.1.3 Individual Bluefin Quota (IBQ) Program

The management structure of the pelagic longline fishery was fundamentally changed in 2015 with the implementation of Amendment 7 to the 2006 Consolidated HMS FMP (79 FR 71510; December 2, 2014)(Amendment 7). Prior to Amendment 7, bluefin tuna bycatch was disincentivized primarily through target catch requirements for limited allowable bluefin retention. Target catch requirements were revoked under Amendment 7 in favor of the IBQ Program to manage bluefin tuna bycatch and dead discards in the pelagic longline fishery. The implementation of Amendment 7 shifted the focus of limiting incidental bluefin catch in the HMS pelagic longline fishery from fleet-wide management measures to individual vessel accountability through the implementation of a bluefin tuna catch share program (i.e., the IBQ Program).

Four components of Amendment 7 affected the Atlantic pelagic longline fishery with respect to limiting incidental bluefin tuna catch in the pelagic longline fishery:

1. Two pelagic longline gear restricted areas.
2. The IBQ Program, which established vessel-specific bluefin allocations for landings and dead discards and required retention of all legal-size bluefin tuna.
3. Mandatory electronic monitoring (EM) of pelagic longline gear at haulback.
4. Catch reporting of each pelagic longline set using VMS.

The expanded EM and VMS reporting requirements were implemented to support the new IBQ Program and the inseason monitoring of the pelagic longline and purse seine fisheries, and are not

discussed further in this document. The conservation and management measures in Amendment 7 became effective January 1, 2015, with two exceptions. EM requirements in the pelagic longline fishery became effective on June 1, 2015, and trip level accountability requirements in the IBQ Program became effective on January 1, 2016. Additional adjustments became effective January 23, 2018, and require participants to secure enough quota to account for incidental catch of bluefin and meet minimum IBQ quota requirements on a quarterly, rather than trip-level, basis.

The IBQ Program distributes IBQ allocation (i.e., an amount of bluefin quota, expressed as a weight in pounds or metric tons) that may be used to account for landings and dead discards to fishery participants based on the IBQ share percentage associated with an Atlantic Tunas Longline permit. NMFS established three tiers of IBQ shares (low, medium, and high) and assigned shares after considering each pelagic longline fishery vessel's fishing activity from 2006-2012, and their success rate in avoiding bluefin tuna during those operations, expressed as a ratio of bluefin catch to target catch. The quota share allocation formula was intended to acknowledge past bluefin tuna avoidance, ensure a fair initial allocation, and consider the diversity in vessel fishing patterns and harvest characteristics. Past fishing that resulted in fewer bluefin tuna interactions will result in larger IBQ shares of bluefin tuna. Landings of designated species are an indicator of both the level of fishing effort and activity as well as vessel success at targeting those species and minimizing bluefin bycatch interactions. This method incorporates the rate of historical bluefin tuna interactions but also includes the amount of designated species landings, recognizing that greater levels of fishing activity are likely to be correlated with a greater number of bluefin tuna interactions. Each tier corresponds to a specific share percentage of the annual Longline category quota that the qualified participant receives as IBQ allocation. A share tier is equivalent to a certain amount (metric tons) of bluefin quota that is annually disbursed to a permitted vessel, and depends on the total annual Longline category quota and inseason quota adjustments. Fishery participants that did not receive a share can still obtain the allocation required to go fishing by leasing through the online IBQ System. If fishing results in more landings and dead discards than can be covered by a participant's IBQ allocation ("quota debt"), then that participant must obtain more IBQ allocation to account for the excess bluefin catch.

Since implementation of Amendment 7, NMFS has observed a decrease in the number of bluefin tuna dead discards by pelagic longline vessels due to individual vessel accountability, and the annual bluefin tuna Longline category quota, as supplemented by inseason quota transfers and other adjustments, has not been reached. Furthermore, while a small number of fishery participants entered quota debt (i.e., landings and/or dead discards exceeded the amount of IBQ allocation held by the permitted vessel), on each occasion the participant was able to lease enough allocation to resolve the debt as required. Initially, accounting for quota debt was on an annual basis (for the first year of the program) and then moved to a trip level basis. Starting on January 27, 2018, accounting for quota debt changed from a trip-level basis (whereby a participant with a permit in quota debt must reconcile the debt and meet the minimum regional IBQ requirement before the start of the next trip) to a quarterly basis (whereby a participant must reconcile quota debt and meet the minimum regional IBQ requirement with IBQ allocation prior to departing on the first trip of a subsequent quarter) to provide additional flexibility for active vessels (82 FR 61489, December 28, 2017).

Given the uncertainties with implementing a new program, NMFS committed to a formal review of the IBQ Program three years after finalizing Amendment 7. That document, the Three-Year Review of the Individual Bluefin Quota Program was finalized in September 2019. The Three-Year Review discusses whether and how the IBQ Program has met its objectives. These objectives, as identified under Amendment 7, include:

1. Limit the amount of bluefin landings and dead discards in the pelagic longline fishery;
2. Provide strong incentives for the vessel owner and operator to avoid bluefin tuna interactions;
3. Provide flexibility in the quota system to enable full accounting of bluefin tuna mortality while minimizing constraints on target species fishing activity;
4. Balance objectives of limiting landings and dead discards with the objective of optimizing fishing opportunities and maintaining profitability; and
5. Balance the above objectives with potential impacts on the directed permit categories that target bluefin tuna, and broader objectives of the 2006 Consolidated HMS FMP and the Magnuson-Stevens Act.

Analyses in the Three-Year Review indicate that the IBQ Program has met expectations for objectives 1- 3. The review shows that the IBQ Program was successful in limiting bluefin bycatch in the pelagic longline fishery (based on data detailing landings and dead discards before and after implementation). It also provided evidence of the effectiveness of the regulatory incentives to avoid bluefin. The Three-Year Review also summarized data indicative of inherent flexibility available through the IBQ Program to account for bluefin catch, address quota debt and minimize constraints on fishing for target species. The Three-Year Review also noted that balancing the objective of limiting bluefin catch with the objective of optimizing fishing opportunities and maintaining profitability was achieved in the context of the IBQ Program. However, it is difficult to separate out the influence of the IBQ Program from other factors, including the effect of swordfish imports on the market for U.S. products, other regulations such as closed and gear restricted areas, as well as target species availability and price. Despite data suggesting reduced revenue and fishing effort shortly after implementation (e.g., from 2014 to 2015), average annual operating income per vessel has increased since implementation, supporting the contention that the economic situation has stabilized for many of the vessels that fished during the IBQ period. NMFS was able to successfully balance achieving the IBQ Program objectives with impacts on the permit categories that target bluefin and on HMS dealers, as well as the broader objectives of the 2006 Consolidated HMS FMP and the Magnuson-Stevens Act. Prior to the implementation of Amendment 7, pelagic longline vessels had large amounts of regulatory dead discards, and the Longline category consistently exceeded its quota by very large amounts (primarily due to dead discards). In contrast, after implementation, the Longline category no longer overharvested its quota.

The Three-Year Review also evaluates standard catch share program components. These include: allocations and accountability rules; eligibility; catch and sustainability; accumulation caps; data collection, reporting, monitoring, and enforcement; duration; new entrants; and cost recovery. While the IBQ Program may be considered successful with respect to many of these evaluative aspects, NMFS determined in the Three Year Review that some updates to the program might be appropriate or warrant consideration, including but not limited to: (a) new distribution method for IBQ shares or IBQ allocation to ensure that use of quota is optimized, and (b) whether accumulation caps are needed to reduce excessive control of IBQ shares or allocation (new data are available to support additional analyses and consideration). NMFS has completed scoping on an amendment ("Amendment 13") to the 2006 Consolidated HMS FMP that will consider some of these potential modifications (84 FR 23020; May 21, 2019).

1.1.4 Public Feedback on Bluefin Tuna Management

As described above, since implementation of Amendment 7, NMFS has required increased pelagic longline vessel accountability in fishing practices; however, effort within the pelagic longline fishery has decreased and quotas established for target species (*e.g.*, swordfish) are not being met.

Therefore, NMFS has facilitated numerous discussions concerning the regulatory environment established under Amendment 7.

The management objectives for actions implemented in Amendment 7 were to:

- Prevent overfishing, achieve on a continuing basis optimum yield, and minimize bluefin bycatch to the extent practicable by ensuring that domestic bluefin tuna fisheries continue to operate within the overall Total Allowable Catch set by ICCAT consistent with current ICCAT Recommendations.
- Optimize the ability for all permit categories to harvest their full bluefin quota allocations; account for mortality associated with discarded bluefin in all categories; maintain flexibility of the regulations to account for the highly variable nature of the bluefin fishery; and maintain fairness among permit/quota categories.
- Reduce dead discards of bluefin and minimize reductions in target catch in both directed and incidental bluefin fisheries, to the extent practicable.
- Improve the timeliness and quality of catch data through enhanced reporting and monitoring to ensure that landings and dead discards do not exceed the quota and to improve accounting of all sources of fishing mortality.

At the Spring 2017 HMS Advisory Panel meeting, NMFS presented a summary of numerous requests from the public. These included requests to revise or remove regulations impacting the ability to catch swordfish quota; to revise or remove time/area closures to increase access to fishing grounds; to remove the June Northeast Closure as redundant with IBQ requirements; and to revise/remove weak hook requirements in the Gulf of Mexico.

Subsequently, at the Fall 2017 HMS Advisory Panel meeting, NMFS provided presentations to further discussion on closed area and gear restricted area management and for weak hook management in the Gulf of Mexico. NMFS specifically received comments from pelagic longline participants and other interested parties, including comments at the Spring and Fall 2017 Atlantic HMS Advisory Panel meetings, to examine whether older fleet-wide measures such as gear requirements, area restrictions, or time/area closures may no longer be necessary to reduce bluefin tuna bycatch and still meet the objectives of the 2006 Consolidated HMS FMP and subsequent amendments. Area-based management issues were identified as a high priority for further consideration at that meeting. The HMS Advisory Panel expressed support for the continued development of management options to be presented at the Spring 2018 Advisory Panel meeting.

A scoping document was developed, and five scoping meetings (83 FR 8969; March 2, 2018) were held to solicit comments on more refined potential management options. The scoping document for this regulatory amendment described a number of management options as potential alternatives for each aspect of this rulemaking. The area-based management options in the scoping document were very similar across the areas. The weak hook section contained three management options. Each of the measures were aligned with the objectives laid out in the scoping document and listed in this section.

NMFS accepted comments on the scoping document for 60 days (March 2 through May 1, 2018) (see Appendix A for a summary of comments received during scoping). During the scoping comment period, NMFS received substantial public comment and feedback on the management options in the scoping document. Pelagic longline fishermen and dealers generally expressed support for removal of regulations that they considered to be redundant or unnecessarily restrictive, since they felt the IBQ Program effectively limits individual vessel bluefin landings and dead discards; established a system to enforce accountability for bluefin tuna catch; and

implemented incentives to reduce bluefin interactions throughout the year. Pelagic longline fishermen felt that those measures have had the needed effects of reducing bluefin tuna bycatch mortality in the longline fishery. Pelagic longline fishermen and dealers believed that removing some the existing management measures might allow pelagic longline fishermen to more fully harvest the U.S. swordfish quota, and mitigate the decline of other catch (e.g. bigeye, albacore, yellowfin, and skipjack tunas), and declines in pelagic longline fishery participation.

Also during scoping, NMFS received comments opposed to changing the management of the Gulf of Mexico GRAs to maximize protections for spawning bluefin tuna. Comments opposed to changing the regulations, particularly the Gulf of Mexico GRAs, included approximately 13,444 form letter campaign submissions. While many of these comments opposed changes to the Gulf of Mexico GRAs because of the need to protect spawning bluefin, the majority of those commenters supported a seasonal weak hook requirement in the Gulf of Mexico because: 1) weak hooks would still be mandatory when spawning bluefin were present; and 2) data shows that white marlin bycatch increases with weak hook use in the latter half of the year. Northeast commercial handgear fishermen expressed concerns that modifying any restrictions on pelagic longline fishermen might negatively impact the bluefin tuna stock, and their own fishing opportunities for bluefin tuna. Some of these commercial handgear fishermen suggested expanding the areas considered in this regulatory amendment and more restrictive regulations in order to reduce pelagic longline interactions with bluefin tuna. Recreational fishing groups urged NMFS to first collect data in areas that are currently closed to pelagic longline vessels before opening those closed areas.

NMFS published a DEIS (84 FR 22492; May 17, 2019) that identified and analyzed 14 alternatives after considering feedback from the HMS Advisory Panel and public comment received during the scoping period. NMFS received comments on the DEIS at the Spring 2019 HMS Advisory Panel meeting. NMFS published a proposed rule that contained the same alternatives and the same preferred alternatives as the scoping document (84 FR 33205; July 12, 2019). NMFS subsequently published a correction notice (84 FR 38918; August 8, 2019) to address some minor errors in the description of two preferred alternatives, and a notice announcing an additional hearing in Gloucester, MA (84 FR 45734; August 30, 2019). In total, in addition to the Advisory Panel meeting, NMFS hosted five public hearings and two webinars on the proposed rule and DEIS. The comment period for the proposed rule and the DEIS ended on September 30, 2019. Approximately 11,460 comments, many of which were form letter campaign submissions, were submitted to the agency, including comments from the Environmental Protection Agency, the Department of the Interior, and the State of Florida.

1.2 Social and Economic Concerns

To satisfy mandates of NEPA and the Magnuson-Stevens Act, this document identifies and evaluates the direct, indirect, and cumulative impacts of the action on the social and economic elements of the human environment. These provisions are outlined in greater detail in Chapters 4 through 7.

The Magnuson-Stevens Act subsection 303(a)(9) requires any FMP to include a fishery impact statement which shall assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for:

- Participants in the fisheries and fishing communities affected by the plan or amendment.
- Participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants.

- The safety of human life at sea, including whether and to what extent such measure may affect the safety of participants in the fishery.

A similar analysis using much of the same economic and social data is included to ensure consistency with National Standard 8 of the Magnuson-Stevens Act (sec. 301(a)(8)), which requires that conservation and management measures shall, consistent with the conservation requirements of the Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirement of paragraph (2) [i.e., National Standard 2], in order to (a) provide for the sustained participation of such communities, and (b) to the extent practicable, minimize adverse economic impacts on such communities.

Additionally, section 304(g)(1)(C) requires the Secretary to:

- Evaluate the likely effects, if any, of conservation and management measures on participants in the affected fisheries; and,
- Minimize, to the extent practicable, any disadvantage to U.S. fishermen in relation to foreign competitors.

Since 2012, three years prior to the IBQ Program being implemented, overall revenue and effort has declined in the pelagic longline fishery (Table 1.1). Furthermore, especially since implementation of the IBQ Program, NMFS has received suggestions from the public and HMS Advisory Panel members that NMFS evaluate ways to reduce regulatory burden and to consider whether regulations intended to accomplish similar objectives may be duplicative and overly burdensome on fishery participants. NMFS is investigating ways to improve revenues by the pelagic longline fleet, including reviewing whether area management and weak hook regulations are still needed in order to appropriately limit bluefin interactions and dead discards, consistent with the science-based conservation objectives for managing the stock, particularly given that available quotas for target stocks are consistently underutilized. Removal of these measures could reduce redundancies in regulations that are similar in effect and provide increased flexibility and opportunity for the pelagic longline fleet to harvest target species like yellowfin tuna and swordfish, while still appropriately conserving and managing the bluefin stock consistent with ICCAT recommended quotas, legal obligations, and other management measures.

Table 1.1 Estimated Revenue and Effort in the Pelagic Longline Fishery (2012–2018)

Year	Total Pelagic Longline Revenue	Effort (# of Hooks)
2012	$47,456,242	7,937,918
2013	$42,572,477	7,549,887
2014	$34,523,359	6,984,239
2015	$27,042,956	5,893,799
2016	$25,322,560	5,278,750
2017	$27,053,154	5,327,587
2018	$21,051,747	4,030,875

Source: HMS Logbook and relevant dealer data.

1.3 Scope and Organization of this Document

This FEIS assesses potential impacts on the biological and human environments associated with adjustments to area-based and weak hook management measures. Specifically, it analyzes the potential direct, indirect, and cumulative ecological, social, and economic impacts associated with 14 alternatives. In considering the management measures outlined in this document, NMFS is responsible for complying with a number of Federal statutes, including NEPA. Under NEPA, Federal agencies prepare an Environmental Impact Statement (EIS) if a proposed major federal action is determined to significantly affect the quality of the human environment. An EIS is an analytical document that provides full and fair discussion of significant environmental impacts and informs decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. In developing this document, NMFS adhered to the procedural requirements of NEPA; the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations (CFR) 1500-1508), and NOAA's procedures for implementing NEPA, including NAO 216-6A and the accompanying Companion Manual, as well as a supplement to NAO 216-6, entitled, "Revised and Updated NEPA Procedures for Magnuson-Stevens Fishery Management Actions," which sets forth the policies and procedures for NEPA compliance for such actions.

The following definitions were generally used to characterize the nature of the various impacts evaluated with this FEIS

- *Short-term or long-term impacts*: These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. In general, short-term impacts are those that would occur only with respect to a particular activity or for a finite period. Long-term impacts are those that are more likely to be persistent and chronic.

- *Direct or indirect impacts*: A direct impact is caused by a proposed action and occurs contemporaneously at or near the location of the action. An indirect impact is caused by a proposed action and might occur later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.

- *Minor, moderate, or major impacts*: These relative terms are used to characterize the magnitude of an impact. Minor impacts are generally those that might be perceptible but, in their context, are not amenable to measurement because of their relatively minor character. Moderate impacts are those that are more perceptible and, typically, more amenable to quantification or measurement. Major impacts are those that, in their context and due to their intensity (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation to fulfill the requirements of NEPA.

- *Adverse or beneficial impacts*: An adverse impact is one having adverse, unfavorable, or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. A single act might result in adverse impacts on one resource and beneficial impacts on another resource.

- *Cumulative impacts*: CEQ regulations implementing NEPA define cumulative impacts as the "impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." (40 CFR 1508.7)

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time within a geographic area.

In addition to NEPA, NMFS must comply with other Federal statutes and requirements such as other provisions of the Magnuson-Stevens Act, Executive Order 12866, and the Regulatory Flexibility Act. This document contains the comprehensive analyses needed to meet these requirements. Chapter 2 gives a description of the different alternatives for each issue. Chapter 3 provides a description of the pelagic longline fishery; a description of the management measures and recent fishery data from areas considered in this rulemaking; biological information on bluefin tuna; and information (data and maps) on bycatch species commonly encountered by the pelagic longline fishery. Chapter 4 provides the ecological and socioeconomic effects of the conservation and management measures, including an analysis of alternative impacts on Essential Fish Habitat. Chapter 5 discusses any cumulative impacts regarding the preferred alternatives. Chapters 6 and 7 analyze the economic impacts of the alternatives and address the requirements of a Regulatory Impact Review (RIR) (see Executive Order 12866) and the Final Regulatory Flexibility Analysis required under the Regulatory Flexibility Act. Chapters 8 and 9 also provide additional information that is required under various statutes. Chapter 10 provides a list of organizations, individuals, and agencies involved in the development of the document. Appendices are included to:

- Summarize comments received from Scoping (Appendix A)
- Summarize research conducted by the Southeast Fisheries Science Center on the effect of weak hook deployment on catch rates of pelagic longline target and bycatch species (Appendix B);
- Provide additional maps requested by the public during scoping and the public comment period showing catch and effort information in "shot charts" (Appendix C);
- Provide supplemental information to address specific public comments (Appendix D and Appendix E); and
- Review the comments received during the public comment period for the proposed rule and DEIS associated with this rulemaking (Appendix F). Responses to comments are also included in this appendix.

While some of the chapters were written in a way to comply with the specific requirements under these various statutes and requirements, it is the document as a whole that meets these requirements and not any individual chapter.

1.4 Purpose, Need, and Objectives

The purpose of this document is to evaluate some current area-based and gear management measures, based on an assessment that such measures no longer remain necessary to reduce and/or maintain low numbers of bluefin tuna discards and interactions in the pelagic longline fishery. For some measures, there is an evaluative component to determine whether such measures can be removed consistent with conservation and management objectives and to be precautionary given uncertainty about effects in previously-closed areas. The need for this action is based on recent successes with the IBQ Program, including the shift in management focus towards individual vessel accountability in the pelagic longline fishery; the continued underharvest of quotas in target fisheries, particularly the swordfish quota; comments from the public and the HMS Advisory Panel members indicating that certain regulations may be redundant in appropriately limiting bluefin tuna incidental catch in the pelagic longline fishery and thus may be

unnecessarily restrictive of pelagic longline fishery effort; and requests from the public and HMS Advisory Panel members to reduce regulatory burden in relation to carrying out fishing operations.

This FEIS specifically evaluates, or provides a mechanism to evaluate, the continued need for management measures that have similar management objectives. Specifically, NMFS that were implemented in 2015 to reduce bluefin tuna interactions, thereby decreasing the potential for dead discards (i.e., Spring Gulf of Mexico Gear Restricted Area, Cape Hatteras Gear Restricted Area) and management measures implemented in 1999 to minimize dead discards of bluefin tuna (e.g., Northeastern United States Closed Area). A precautionary methodology for evaluating the continued need for these measures would be implemented through the preferred alternatives in this FEIS. This action also evaluated the Gulf of Mexico weak hook requirements, which, similarly, were implemented to minimize bluefin bycatch (in 2011). In evaluating that measure, NMFS also considered how to address increased bycatch of white marlin/roundscale spearfish associated with the use of weak hooks, given the overfished status of white marlin and the need to minimize bycatch and bycatch mortality to the extent practicable. Other management measures and time/area closures were enacted for reasons not specifically related to reducing bluefin tuna interactions and/or discards.

All alternatives included in this rulemaking are evaluated against specific objectives that meet the purpose of the rulemaking. These objectives were developed with the intention that preferred management actions will not compromise the primary conservation goals, consistent with requirements of the Magnuson-Stevens Act and the Atlantic Tunas Convention Act. Specifically, alternatives must not compromise NMFS' ability to continue to prevent or end overfishing of relevant stocks; rebuild overfished stocks; minimize bycatch and bycatch mortality; manage Atlantic HMS fisheries for optimum yield; be aligned with regulations implemented to support ICCAT recommendations; minimize to the extent practicable adverse social and economic impacts on related fisheries, fishing communities, and recreational and commercial activities; and minimize to the extent practicable any disadvantage to U.S. fishermen in relation to foreign competitors. The objectives of this rulemaking, consistent with the objectives of the 2006 Consolidated HMS FMP and its amendments, are to:

- Continue to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear consistent with the conservation and management objectives (e.g., prevent or end overfishing, rebuild overfished stocks, manage Atlantic HMS fisheries for continuing optimum yield) of the 2006 Consolidated HMS FMP, its amendments, and all applicable laws.
- Simplify and streamline Atlantic HMS management, to the extent practicable, by reducing any redundancies in regulations established to reduce bluefin tuna interactions that apply to the pelagic longline fishery.
- Optimize the ability for the pelagic longline fishery to harvest target species quotas (e.g., swordfish), to the extent practicable, while also considering fairness among permit/quota categories.

1.5 References

NMFS. 1999. Fishery Management Plan for Atlantic Tunas, Swordfish and Sharks. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

NMFS. 2014. Final Amendment 7 to the 2006 Consolidated Atlantic Highly Migratory Species Fishery Management Plan. USDOC, NOAA, NMFS, Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD.

NMFS. 2019. Stock assessment and fishery evaluation (SAFE) report for Atlantic highly migratory species. Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD 20910.

2 Summary of the Alternatives

NEPA requires that any Federal agency proposing a major federal action consider all reasonable[2] alternatives, in addition to the final action. The evaluation of alternatives in an EIS assists NMFS in ensuring that any unnecessary impacts are avoided through an assessment of alternative ways to achieve the underlying purpose of the project that may result in less environmental harm.

To warrant detailed evaluation, an alternative must be reasonable and meet the purpose and need of the action (see Chapter 1). Screening criteria are used to determine whether an alternative is reasonable. The following discussion identifies the screening criteria used in this EIS to evaluate whether an alternative is reasonable; evaluates various alternatives against the screening criteria (including the proposed measures) and identifies those alternatives found to be reasonable; identifies those alternatives found not to be reasonable; and for the latter, the basis for this finding.

Screening Criteria—To be considered "reasonable" for purposes of this EIS, an alternative must be designed to meet the purpose and need for action described in Chapter 1 and meet the following criteria:

- *An alternative must meet goals consistent with rebuilding and fishery management plans;*
- *An alternative must be consistent with the 10 National Standards set forth in the Magnuson-Stevens Act;*
- *An alternative must be administratively feasible and enforceable. The costs associated with implementing an alternative cannot be prohibitively exorbitant or require unattainable infrastructure;*
- *An alternative cannot violate other laws (e.g., Atlantic Tunas Convention Act (ATCA), Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA));*
- *An alternative must be consistent with the 2006 Consolidated HMS FMP and its amendments;*
- *An alternative must be consistent with ICCAT recommendations, which the United States is legally obligated to implement as necessary and appropriate under ATCA;*
- *An alternative must be consistent with the Terms and Conditions and Reasonable and Prudent Alternatives of applicable biological opinions (BiOp);*
- *An alternative should optimize the ability of permit categories to harvest target species and mitigate factors contributing to the continued decline in pelagic longline effort and target species landings;*
- *An alternative should not result in additional regulations that may be considered redundant in effect to existing regulations.*

This FEIS includes analysis of a wide range of alternatives, and prefers a set of alternatives that would achieve the objectives of this regulatory amendment (as described in Chapter 1). NMFS developed a range of alternatives considering changes to spatially managed areas that were

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[2] "Section 1502.14 (of NEPA) requires the EIS to examine all reasonable alternatives to the proposal . . . Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the [proponent]." (CEQ, "NEPA's Forty Most Asked Questions" (available at https://www.energy.gov/sites/prod/files/G-CEQ-40Questions.pdf) (emphasis added))

specifically implemented to reduce bluefin tuna interactions or dead discards, and changes to weak hook requirements in the Gulf of Mexico intended to reduce bluefin tuna interactions. The environmental, economic, and social impacts of these alternatives are discussed in later chapters.

2.1 Area-Based Alternatives

2.1.1 Northeastern United States Closed Area

The Northeastern United States Closed Area is located in the North Atlantic Ocean off the coast of New Jersey. Regulations at 50 C.F.R. § 635.2 define this area as the Atlantic Ocean area bounded by straight lines connecting the following coordinates in the order stated: 35°00′ N. lat., 60°00′ W. long.; 55°00′ N. lat., 60°00′ W. long.; 55°00′N. lat., 20°00′ W. long.; 35°00′ N. lat., 20°00′ W. long.; 35°00′ N. lat., 60°00′ W. long. The Northeastern United States Closed Area was implemented in 1999 to reduce bluefin tuna discards in the pelagic longline fishery and is being analyzed in this rulemaking because it has similar objectives to the IBQ Program (i.e., to limit the total amount of landings and dead discards incurred by the pelagic longline fleet in the pelagic longline fishery).

Alternative A1: No Action. Maintain the Northeastern United States Closed Area regulations.

Under Alternative A1, NMFS would maintain the Northeastern United States Closed Area (Figure 2.1), as it is currently defined. The currently defined area would remain closed to all vessels using pelagic longline gear onboard from June 1 through June 30 of a given year.

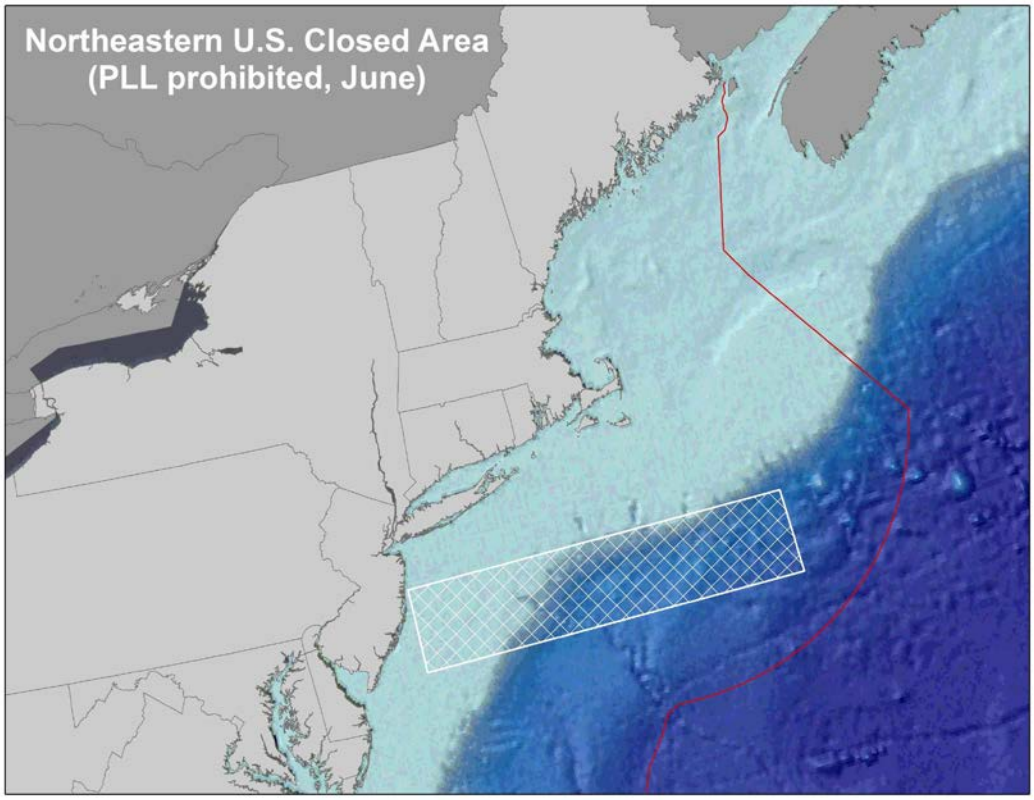

Figure 2.1 Northeastern U.S. Closed Area-Current Boundaries (White Polygon)

Alternative A2: Modify the Current Northeastern United States Closed Area to Remove a Western Portion of the Closed Area

This alternative would modify the Northeastern United States Closed Area, as currently defined at § 635.2, by removing portions of the closure that the analyses undertaken in this FEIS indicate: 1) did not historically have high numbers of bluefin discards reported in the HMS logbook during the timeframe of data (1996-1997) originally analyzed for implementation of the closure in 1999, and 2) were adjacent to areas that recently (2015-2018) did not have bluefin interactions. The coordinates of this modified area would be, clockwise from the northwest corner: 40º 0' N latitude, 71º 0' W longitude; 40º 0' N latitude, 68º 0' W longitude; 39º 0' N latitude, 68º 0' W longitude; 39º 0' N latitude, 70º 0' W longitude. The effective time period of this closure would remain from June 1 through June 30 each year. This alternative is designed to continue to prohibit fishing in areas that might have higher interaction rates, as inferred from interaction rates in adjacent open areas, while also providing additional fishing opportunity in locations that are not adjacent to areas with known higher interaction rates.

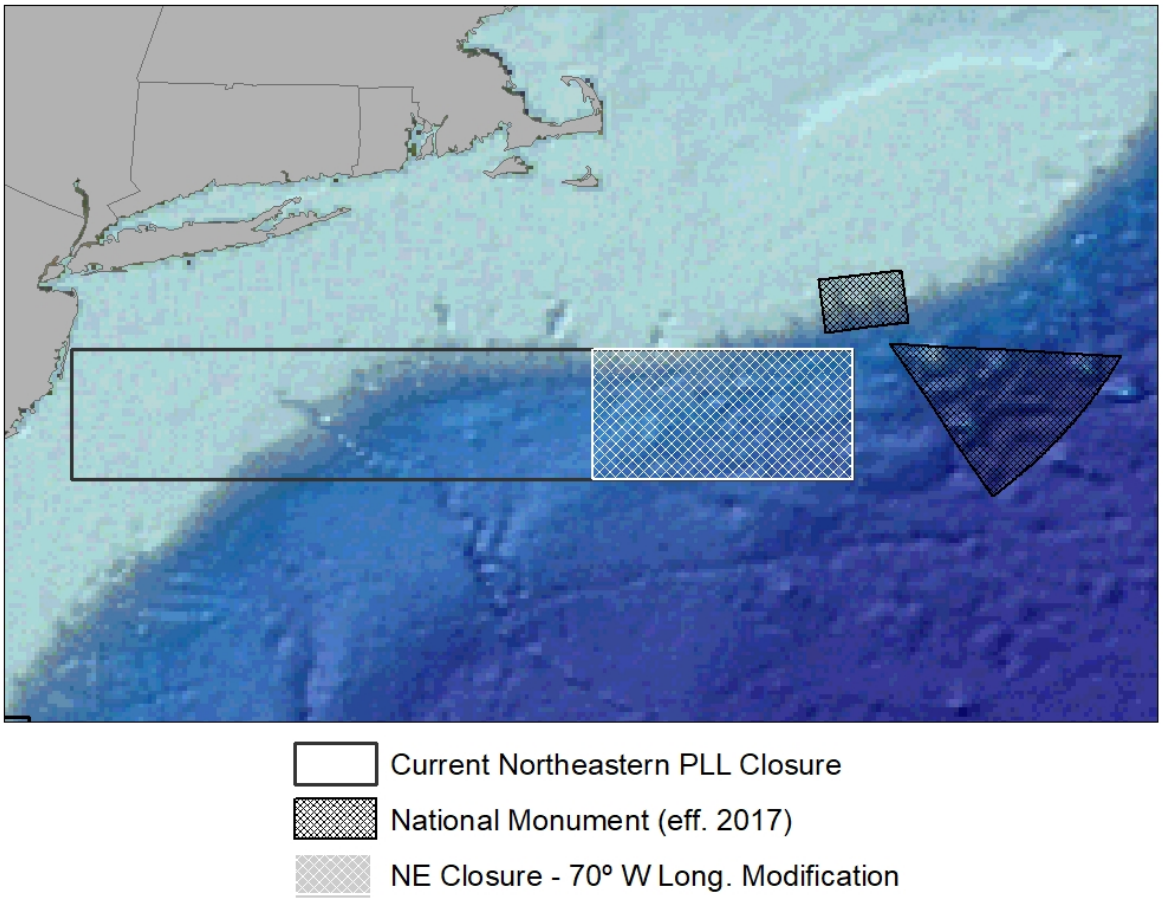

Figure 2.2 Location of the Current Northeastern U.S. Closed Area (Single Black Line) with Boundaries of the Considered Modification Superimposed (White Polygon Border and Grid)

Alternative A3: Convert the Northeastern United States Closed Area to a Gear Restricted Area with Individual Performance Based Access.

This alternative would convert the Northeastern United States Closed Area to a gear restricted area (i.e., the "Northeastern United States Gear Restricted Area"), and allow performance-based vessel access to the Northeastern United States Gear Restricted Area using the access criteria currently used for the Cape Hatteras Gear Restricted Area (currently codified at § 635.21(c)(3) and § 635.14). Vessels would be evaluated against criteria (i.e., performance metrics) evaluating a vessel's ability to avoid bluefin tuna, comply with Pelagic Observer Program requirements, and comply with HMS logbook submission requirements using the three most recent years of available data associated with a vessel. If no data are available, then NMFS would not be able to make a determination about vessel access, and such vessels would be excluded from gear restricted area access until NMFS has collected sufficient data for assessment (consistent with current procedures for the Cape Hatteras Gear Restricted Area). Those vessels that meet the criteria for performance metrics would be allowed to fish in the closed area. This measure would be evaluated after at least three years of data have been collected to determine whether it effectively achieves the management objectives of this rulemaking.

Alternative A4: Undertake a review process to evaluate the continued need for the Northeastern United States Closed Area (Preferred Alternative)

This alternative would convert the "Northeastern United States Closed Area" to a monitoring area, called the "Northeastern United States Pelagic Longline Monitoring Area" (Monitoring Area) and establish a three-year evaluation period during which fishing would be allowed in the Monitoring Area. Fishing activity would be closely monitored by NMFS under a four-step process (Figure 2.3) that would prohibit fishing in the area if the fleet had to use IBQ allocation in exceedance of an established threshold to account for bluefin landings or dead discards. The Monitoring Area would be managed as follows:

—The Monitoring Area would initially remain open to pelagic longline fishing from June 1 to June 30 (Step 1, Figure 2.3).

—There would be an annual 150,519 pound IBQ allocation threshold (i.e., 72 percent of historic overall available Atlantic IBQ allocation) for landings and dead discards of bluefin tuna caught within the Monitoring Area.

—If the threshold is reached, or is projected to be reached, NMFS would file a closure notice for the Monitoring Area with the Office of the Federal Register (Step 2, Figure 2.3).

—On and after the effective date of the notice, the Monitoring Area would be closed to pelagic longline fishing each year from June 1 through June 30, unless NMFS takes further action.

—If no closure notice is filed between June 1, 2020, and December 31, 2022, the Monitoring Area would remain open (Step 2, Figure 2.3), unless, and until, NMFS decides to take additional action.

The area would be closely monitored by NMFS under a process that would prohibit fishing if the fleet were to use IBQ allocation in exceedance of an established annual threshold to account for bluefin landings or dead discards caught within the boundaries of the Monitoring Area.

The 150,519 lb threshold is based on the average annual amount of unused Atlantic IBQ allocation that was available for use by the pelagic longline fleet from June 1 through December 31 (from 2015 through 2018). NMFS decided that this was an appropriate threshold because it will accommodate for data collection in the area while keeping landings and dead discards in the fishery within the levels adopted in Amendment 7 related to the overall amount of IBQ allocation available each year. Using unused allocation as the threshold helps to ensure that opening the area to fishing would not compromise adherence to the overall bluefin quota or the ability of fishery participants to obtain enough IBQ allocation to cover bluefin landings and dead discards for the rest of the year (e.g. January - May). It should be noted that the threshold does not mean that 150,519 lb of IBQ allocation can be used *only* in the Monitoring Area. IBQ allocation is still subject to the same regulations previously applicable. The threshold is for NMFS' monitoring and evaluation purposes of the Monitoring Area only. After the 2020-2022 evaluation period, NMFS will evaluate data collected from the Monitoring Area and compile a report (Step 3, Figure 2.3). Based on the findings of the report, NMFS may then decide to initiate a follow-up action to implement new, longer-term management measures for the area (Step 4, Figure 2.3).

A clarifying modification has been added to this alternative from the DEIS to the FEIS to address what would happen if the U.S. allocation of bluefin is changed at a future ICCAT meeting. The 150,519 lb threshold is approximately 72 percent of the adjusted total Atlantic IBQ allocation currently distributed to the fleet. In the event that the western Atlantic bluefin tuna quota later is reduced at ICCAT and the U.S. allocation of bluefin quota is adjusted downward as a result, the threshold would also be adjusted. Such adjustment would make the threshold 72percent of the total Atlantic IBQ allocation disbursed to the fleet as a result of the lower U.S allocation. If the ICCAT quota were to increase and the United States' allocation increased as well, adjustments would not be made to increase the threshold for several reasons. The current threshold balances the need to limit bycatch of bluefin tuna in the pelagic longline fishery with providing fishing opportunity for pelagic longline vessels to harvest available target quotas. NMFS received comments from the public expressing concern about increases in the amount of mortality that could occur under any change to the status quo, encouraging the agency not to undertake actions that could increase mortality of bluefin tuna. Because the area has been closed, there is uncertainty concerning the ecological impacts of allowing pelagic longline fishing in this area. Based on data available from 2015-2018, NMFS identified a conservative threshold which provides a substantial buffer of IBQ allocation to account for bluefin landings and dead discards in the event of disaster sets under known levels of fishing effort. By not adjusting upwards, NMFS is ensuring that the amount of mortality is limited to a level that is comparable to what could have reasonably occurred between 2015 and 2018 to minimize risk and address all rulemaking objectives and public concern.

A second clarification concerns the timing of inseason notices that could be filed in response to the threshold for this area being met. NMFS originally noted in the DEIS in the description of the preferred alternative that "*If no closure notice is filed between January 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action*". Since the thresholds are not cumulative in nature with respect to IBQ allocation use by the pelagic longline fishery to account for landings and dead discards, the design of this process would not necessitate inseason closure to be filed until after the respective start dates for monitoring. NMFS is adjusting this statement to read "*If no closure notice is filed between June 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action*".

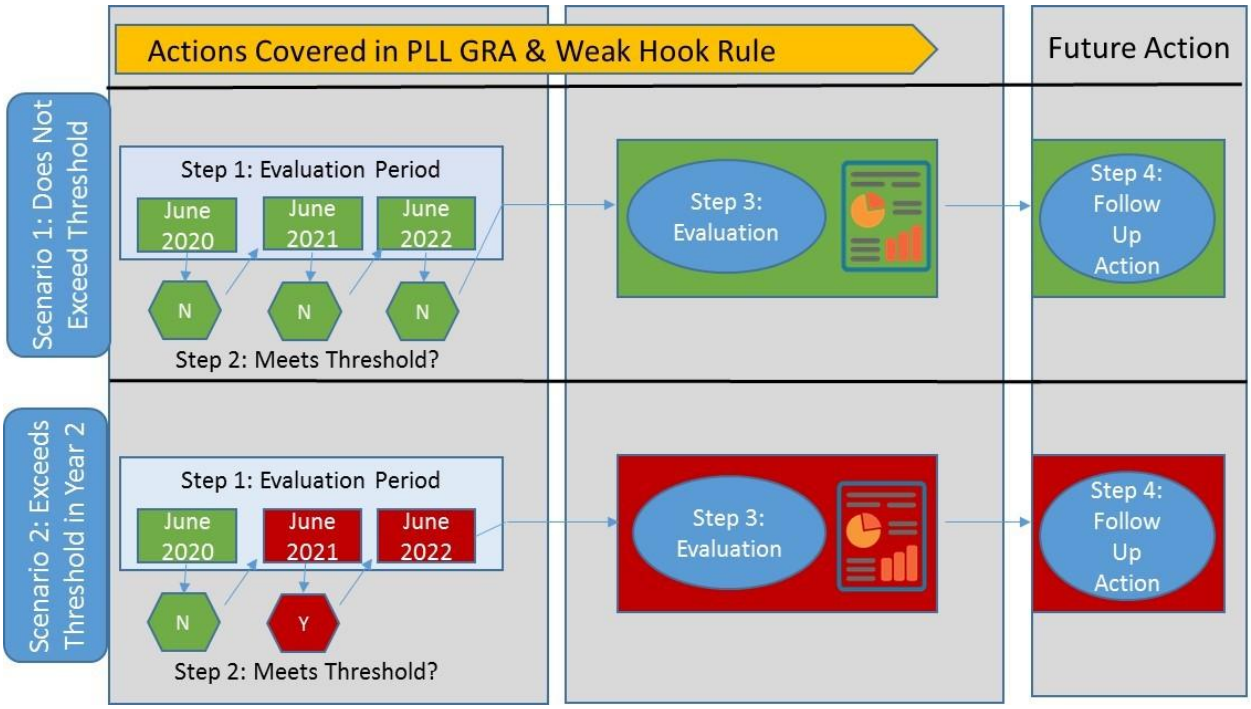

Figure 2.3 Example Schematics for an Evaluation Program for the Northeastern U.S. Monitoring Area

Green is indicative of fishing being allowed in the area, while red is indicative of partial (i.e., a mid-month inseason closure in June 2021 under Scenario 2) or complete closure of the area to fishing.

Alternative A5: Eliminate the Northeastern United States Closed Area

This alternative would eliminate all current restrictions associated with the Northeastern United States Closed Area.

2.1.2 Cape Hatteras Gear Restricted Area

The Cape Hatteras Gear Restricted Area is located in the North Atlantic Ocean off the coast of North Carolina. Per § 635.2, this area is defined as an area within the Atlantic Ocean bounded by straight lines connecting the following coordinates in the order stated: 34°50′ N. lat., 75°10′ W. long.; 35°40′ N. lat., 75°10′ W. long.; 35°40′ N. lat., 75°00′ W. long.; 37°10′ N. lat., 75°00′ W. long.; 37°10′ N. lat., 74°20′ W. long.; 35°30′ N. lat., 74°20′ W. long.; 34°50′ N. lat., 75°00′ W. long.; 34°50′ N. lat., 75°10′ W. long.

The Cape Hatteras Gear Restricted Area was implemented in 2015 to reduce bluefin interactions, thereby reducing the potential for dead discards. It is being analyzed in this rulemaking because it has similar objectives to the IBQ Program (i.e., to limit the total amount of landings and dead discards incurred by the pelagic longline fleet in the pelagic longline fishery).

Alternative B1: No Action. Maintain current gear restricted area off Cape Hatteras, North Carolina, from December through April as well as the performance metrics for access to the area.

This alternative would maintain the current gear restricted area off Cape Hatteras, North Carolina, from December through April as well as the performance metrics for access to that area at § 635.21 (c)(2)(v) and § 635.14, respectively. Vessels would be evaluated against criteria (i.e., performance metrics) evaluating their ability to avoid bluefin tuna, comply with Pelagic Observer Program requirements, and comply with HMS logbook submission requirements using the three most recent years of available data associated with a vessel. If no data are available, then NMFS would not be able to make a determination about vessel access, and such vessels would be excluded from gear restricted area access until NMFS has collected sufficient data for assessment (consistent with current operational Amendment 7 implementation procedures). Those vessels that meet the criteria for performance metrics would be allowed to fish in the closed area.

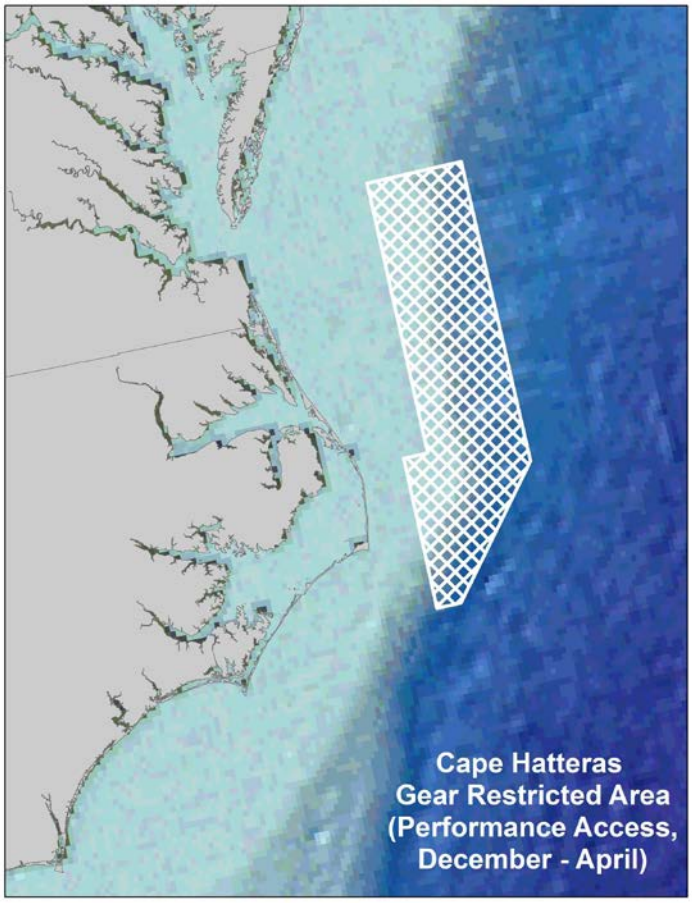

Figure 2.4 Cape Hatteras Gear Restricted Area-Current Boundaries (White Polygon)

Alternative B2: Eliminate the Cape Hatteras Gear Restricted Area (Preferred Alternative)

This alternative would remove the current gear restricted area off Cape Hatteras, North Carolina, as currently defined in § 635.2 and all associated regulatory provisions, restrictions, and prohibitions.

2.1.3 Spring Gulf of Mexico Gear Restricted Area

The Spring Gulf of Mexico Gear Restricted Area are located in the Gulf of Mexico off the coasts of Louisiana, Mississippi, Alabama, and Florida. Per §635.2, the first area is defined as an area bounded by straight lines connecting the following coordinates in the order stated: 26°30′ N. lat., 94°40′ W. long.; 27°30′ N. lat., 94°40′ W. long.; 27°30′ N. lat., 89° W. long.; 26°30′ N. lat., 89° W. long.; 26°30′ N. lat., 94°40′ W. long. The second area is bounded by straight lines connecting the following coordinates in the order stated: 27°40′ N. lat., 88° W. long.; 28° N. lat., 88° W. long.; 28° N. lat., 86° W. long.; 27°40′ N. lat., 86° W. long.; 27°40′N. lat., 88° W. long.

The Spring Gulf of Mexico Gear Restricted Area was implemented in 2015 to reduce bluefin interactions, thereby reducing the potential for dead discards. It is being analyzed in this rulemaking because NMFS it has similar objectives to the IBQ Program (i.e., to limit the total amount of landings and dead discards incurred by the pelagic longline fleet in the pelagic longline fishery).

Alternative C1: No Action. Maintain the Spring Gulf of Mexico Gear Restricted Area.

This alternative would maintain the current restrictions regarding the Spring Gulf of Mexico Gear Restricted Area at § 635.2 and § 635.21(c)(2)(vi). Current restrictions would be maintained, which prohibit fishing by all vessels with pelagic longline gear onboard from April 1 through May 31 each year (vessels may transit the area if gear is properly stowed). (Figure 2.5).

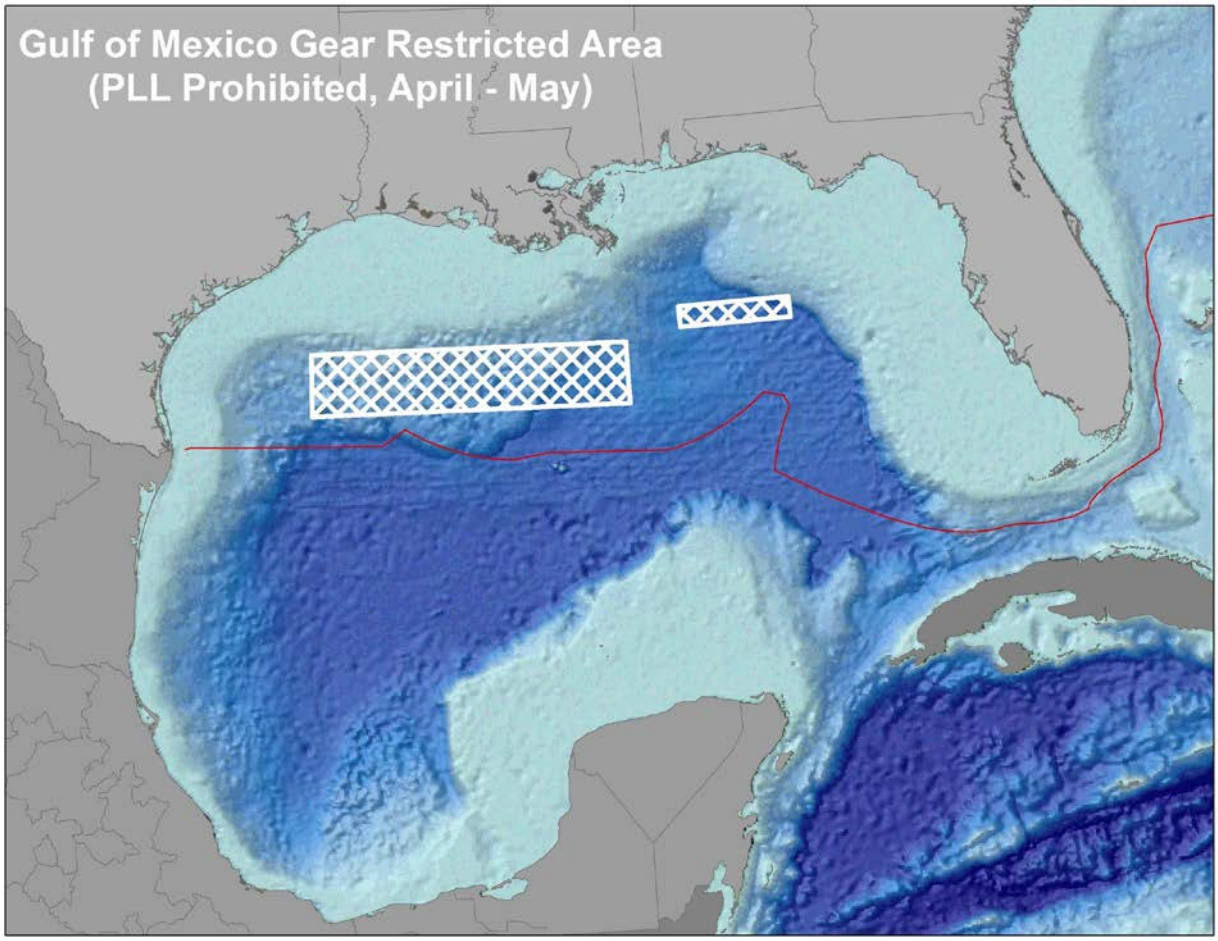

Figure 2.5 Gulf of Mexico Gear Restricted Area-Current Boundaries (White Polygons)

Alternative C2: Allow individual performance-based access to the Spring Gulf of Mexico Gear Restricted Area.

This alternative would allow performance-based access to the Spring Gulf of Mexico Gear Restricted Area as currently outlined applicable to the Cape Hatteras Gear Restricted Area in regulations at § 635.21(c)(3) and § 635.14. Those vessels that meet the criteria would be allowed to fish in the closed area. This measure would be evaluated after at least three years of data have been collected to determine whether this program effectively achieves the management objectives of this rulemaking.

Alternative C3: Undertake a review process to evaluate the continued need for the Spring Gulf of Mexico Gear Restricted Area (Preferred Alternative)

This alternative is similar in concept to Alternative A4 above. This alternative would convert the "Spring Gulf of Mexico Gear Restricted Area", which consists of two areas in the north central Gulf of Mexico, to the "Spring Gulf of Mexico Monitoring Area" (Monitoring Area). It would establish a three-year evaluation period during which fishing would be allowed in the Monitoring Area. Fishing activity would be closely monitored by NMFS under a four-step process (Figure 2.5) that would prohibit fishing if the fleet were to use IBQ allocation in exceedance of an established threshold to account for bluefin landings and dead discards. The Monitoring Area would be managed as follows:

—The Monitoring Area would initially remain open to pelagic longline fishing from April 1 to May 31 (Step 1, Figure 2.5).

—There would be an annual 63,150 pound IBQ allocation threshold (i.e., 72 percent of historical overall available Gulf of Mexico IBQ allocation) for landings and dead discards of bluefin caught within the Monitoring Area.

—If the threshold is reached, or is projected to be reached, NMFS would file a closure notice for the Monitoring Area with the Office of the Federal Register (Step 2, Figure 2.5).

—On and after the effective date of the notice, the Monitoring Area would be closed to pelagic longline fishing each year from April 1 through May 31, unless NMFS takes further action.

—If no closure notice is filed between April 1, 2020 and December 31, 2022, the Monitoring Area would remain open (Step 2, Figure 2.5), unless and until NMFS decides to take additional action.

The area would be closely monitored by NMFS under a process that would prohibit fishing if the fleet were to use Gulf of Mexico IBQ allocation in exceedance of an established annual threshold to account for bluefin landings or dead discards caught within the boundaries of the Monitoring Area. The 63,150 lb threshold is based on the amount of IBQ annual allocation distributed to vessels that fished in the region while the closures were effective between 2015 and 2017. NMFS decided that this was an appropriate threshold because it will accommodate for data collection in the area while keeping landings and dead discards in the fishery with in the science based Longline category sub-quota. This threshold would limit the amount of IBQ that could be used to account for bluefin landings and dead discards in the monitoring area to the amount of IBQ allocation that could be used by the portion of the fleet that was recently (2015 through 2017) active during these months in the Gulf of Mexico. It should be noted that the threshold does not mean that 63,150 lb of Gulf of Mexico IBQ allocation can be used *only* in the Monitoring Area. IBQ allocation is still subject to the

same regulations previously applicable. The threshold is for NMFS' monitoring and evaluation purposes of the Monitoring Area only. After the 2020-2022 evaluation period, NMFS will evaluate data collected from the Monitoring Area and compile a report (Step 3, Figure 2.3). Based on the findings of the report, NMFS may then decide to initiate a follow-up action to implement new, longer-term management measures for the area (Step 4, Figure 2.3).

A clarifying modification has been added to this alternative from the DEIS to the FEIS to address what would happen if the U.S. allocation of bluefin is changed at a future ICCAT meeting. The 63,150 lb is approximately 55 percent of the adjusted total Atlantic IBQ allocation currently distributed to the fleet. In the event that the western Atlantic bluefin tuna quota later is reduced at ICCAT and the U.S. allocation of bluefin quota is adjusted downward as a result, the threshold would also be adjusted. Such adjustment would make the threshold 55 percent of the total Gulf of Mexico IBQ allocation disbursed to the fleet as a result of the lower U.S allocation. If the ICCAT quota were to increase and the United States' allocation increased as well, adjustments would not be made to increase the threshold for several reasons. The current threshold balances the need to limit bycatch of bluefin tuna in the pelagic longline fishery with providing fishing opportunity for pelagic longline vessels to harvest available target quotas. NMFS received comments from the public expressing concern about increases in the amount of mortality that could occur under any change to the status quo, encouraging the agency not to undertake actions that could increase mortality of bluefin tuna. Because the area has been closed, there is uncertainty concerning the ecological impacts of allowing pelagic longline fishing in this area. Based on data available from 2015-2018, NMFS identified a conservative threshold which provides a substantial buffer of IBQ allocation to account for bluefin catch in the event of disaster sets under known levels of fishing effort. By not adjusting upwards, NMFS is ensuring that amounts of landings and dead discards are limited to a level that is comparable to what could have reasonably occurred between 2015 and 2018 to minimize risk and address all rulemaking objectives and public concern.

A second clarification concerns the timing of inseason notices that could be filed in response to the threshold for this area being met. NMFS originally noted in the DEIS in the description of the preferred alternative that "*If no closure notice is filed between January 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action*". Since the thresholds are not cumulative in nature with respect to IBQ allocation use by the pelagic longline fishery to account for landings and dead discards, the design of this process would not necessitate inseason closure to be filed until after the respective start dates for monitoring. NMFS is adjusting this statement to read "*If no closure notice is filed between April 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action*".

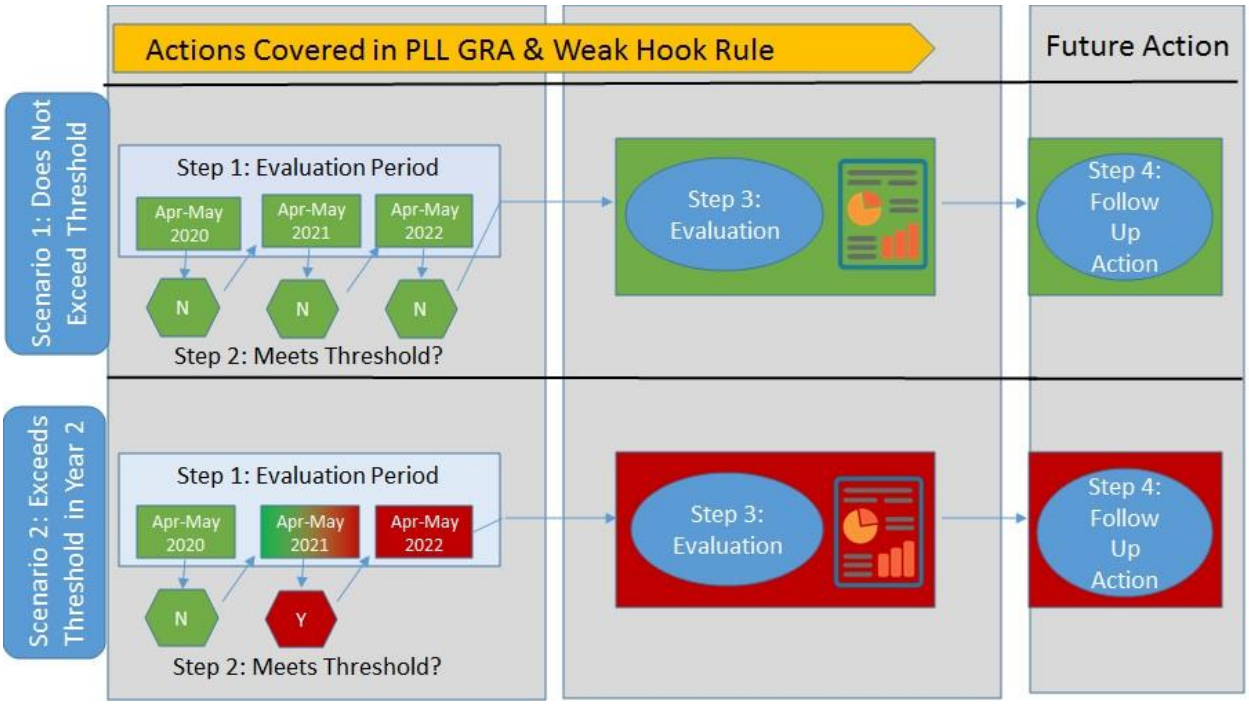

Figure 2.6 Example Schematics for an Evaluation Program for the Spring Gulf of Mexico Monitoring Area

Green is indicative of fishing being allowed in the area, while red is indicative of partial (i.e., a mid-month inseason closure in June 2021 under Scenario 2) or complete closure of the area to fishing.

Alternative C4: Eliminate the Spring Gulf of Mexico Gear Restricted Area

This alternative would remove the Spring Gulf of Mexico Gear Restricted Area as currently defined at § 635.2 and all associated regulatory provisions, restrictions, and prohibitions.

2.2 Gulf of Mexico Weak Hook Alternatives

Weak hook alternatives are focused on gear requirements for pelagic longline fisheries that are conducted in federal waters of the Gulf of Mexico, as defined at 600.105(c).

Year-round, mandatory use of weak hooks by pelagic longline vessels fishing in the Gulf of Mexico was implemented in 2011 to reduce bycatch of bluefin tuna and have short- and long-term benefits on the stock status of Western Atlantic bluefin tuna. It is being analyzed in this rulemaking because NMFS it has similar objectives to the IBQ Program (i.e., to limit the total amount of landings and dead discards incurred by the pelagic longline fleet in the pelagic longline fishery).

Alternative D1: No Action. Maintain Current Weak Hook Requirements in the Gulf of Mexico.

Under Alternative D1, NMFS would maintain the current regulations at 50 CFR § 635.21(c)(5)(iii)(B)(2)(*i*) requiring vessels fishing in the Gulf of Mexico, as defined at 50 CFR 105(c), that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic

Ocean, including the Caribbean Sea and the Gulf of Mexico, to use weak hooks year-round when operating in the Gulf of Mexico.

Alternative D2: Seasonal requirement for Weak Hooks (Preferred Alternative)

This alternative would modify the current regulations to require vessels fishing in the Gulf of Mexico, as defined at 50 CFR § 105(c), that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic Ocean, including the Caribbean Sea and the Gulf of Mexico to use weak hooks when bluefin tuna are highest in abundance from January through June and throughout their known spawning season, which is from April to June. Fishermen may voluntarily choose to continue to use weak hooks when they are not required.

Alternative D3: Remove the Weak Hook Requirement

This alternative would remove regulations that require vessels fishing in the Gulf of Mexico, as defined at 50 CFR § 105(c), that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic Ocean, including the Caribbean Sea and the Gulf of Mexico to use weak hooks. NMFS would continue to encourage voluntary use of weak hooks in the Gulf of Mexico as a conservation strategy for bluefin tuna.

2.3 Alternatives Considered but Not Further Analyzed

2.3.1 Modify the size of the Cape Hatteras Gear Restricted Area

In addition to analyzing alternatives that either maintain the current Cape Hatteras Gear Restricted Area or eliminate it entirely, NMFS considered whether alternatives with modifications to the Cape Hatteras Gear Restricted Area should be included in this rulemaking. Specifically, NMFS considered whether it was appropriate to consider an alternative that would modify (e.g., contract, expand, or move the boundaries of) the gear restricted area to continue to encompass bluefin bycatch "hotspots."

Hotspots consist of discrete areas with elevated bluefin tuna interactions. In the FEIS for Amendment 7, NMFS identified a hotspot within an area off the Coast of North Carolina, which led to the establishment of the Cape Hatteras Gear Restricted Area to encompass that hotspot and reduce interactions. NMFS designed the Cape Hatteras Gear Restricted Area based on the identification of areas with relatively high bluefin interaction rates with pelagic longline gear, establishing the Area's boundaries by drawing boxes around cells with higher interaction rates and an appropriate buffer. The goal of the area was to help reduce bluefin interactions within the gear restricted area.

NMFS compared pelagic longline data depicting the average number of bluefin interactions per year in the Cape Hatteras Gear Restricted Area before and after implementation of the Amendment 7 management measures. Approximately 3,278 bluefin tuna interactions were reported for that area in the HMS logbooks between 2006 and 2011 (an average annual number of ~468 per year). Between 2012 and 2014, the average annual number of interactions dropped to 94 per year within the boundaries of the gear restricted area. Following implementation of Amendment 7 measures,

the average annual number of bluefin interactions in the gear restricted area dropped further to approximately 31 bluefin tuna per year (using 2015-2018 data, Table 3.12).

The two maps in Figure 4.9 show the distribution of the average annual number of bluefin interactions in the mid-Atlantic region against the boundaries of the gear restricted area (outlined with a heavy black line) before and after Amendment 7 implementation. Each grid cell in the maps is labeled with the average annual number of interactions per year occurring in that area (i.e., interactions across all data points falling within that cell were summed up and divided by the number of years to derive an average). Interaction hotspots are clearly visible in the map reflecting pre-Amendment 7 data (left side map), such as the four dark red grid cells depicting between approximately 27 to 96 interactions per year. These interaction rates are approximately 6 to 10 times higher than in adjacent cells shown within the gear restricted area, and between approximately 16 and 330 percent higher than cells shown on the map which are outside and adjacent to the boundary. In contrast, after implementation of Amendment 7 measures (right side map), while there are cells that produce approximately 30 percent more interactions than adjacent cells, the magnitude of interactions in the same area became much smaller (~ 2 to 4 per year/grid cell). Across the two timeframes, the hotspot is no longer apparent following implementation of Amendment 7. Because the interaction rates were less skewed across cells and a hotspot was no longer visually distinguishable, NMFS was unable to delineate any appropriate new or modified gear restricted area boundary around cells with higher interaction rates and an appropriate buffer for impact analyses.

During the scoping comment period and meetings for this action, several comments suggested that a geographic *expansion* of the Cape Hatteras Gear Restricted Area could be warranted. However, all areas suggested for "expansion" were either already covered within the current gear restricted area boundaries, or had minimal bluefin interactions following implementation of Amendment 7 during the December - April effective periods for the gear restricted area.

NMFS determined that there was no scientifically-supportable basis for identifying and further analyzing such an alternative (modifying the gear restricted area in a way that would retain a portion of it, or expanding the current boundaries). Such an alternative, absent a rational basis for its design would not meet the objectives of this rulemaking:

- *Objective 1: Minimize bycatch and bycatch mortality of bluefin and other Atlantic HMS.* The data NMFS reviewed indicates that any alternative that modified or retained the Cape Hatteras Gear Restricted Area would have negligible beneficial ecological impacts for bluefin tuna. Retaining portions of the gear restricted area would not contribute effectively towards the goal of minimizing bycatch and bycatch mortality of bluefin tuna. Similarly, the areas considered for expansion either had no bluefin interactions, or no data to warrant such an expansion. NMFS therefore had no indication that such expansions would enhance the objective of minimizing bycatch.

- *Objective 2: Simplify and streamline Atlantic HMS management, to the extent practicable, by reducing any redundancies in regulations established to reduce bluefin tuna interactions that apply to the pelagic longline fishery.* The gear restricted area provisions impose regulations that are intended to reduce bluefin interactions, as do the regulations associated with the IBQ Program. When Amendment 7 was adopted and implemented, it was not known to what extent the IBQ Program alone would reduce bluefin interactions within the fishery. There was also evidence of a bluefin hotspot within the area ultimately identified as the Cape Hatteras Gear Restricted Area. The data post-Amendment 7 implementation shows

that the IBQ Program has reduced bluefin bycatch effectively. Furthermore, data from the Cape Hatteras Gear Restricted Area indicates that a hotspot no longer exists within the area or the nearby surrounding areas. Thus, given the minimal ecological benefits of expanding or retaining a portion of the gear restricted area, such actions may not be justified as being needed to achieve Magnuson-Stevens Act management objectives. Because there are already measures in place that require the pelagic longline fleet to account for incidental catch of bluefin, expanding the area or retaining it may not meet the objective of simplifying and streamlining Atlantic HMS management measures.

- *Objective 3:* Optimize the ability for the pelagic longline fishery to harvest target species quotas (*e.g., swordfish), to the extent practicable, while also considering fairness among permit/quota categories.* As discussed in Chapter 4, most of the pelagic longline fleet has met the current criteria established for access based on performance metrics. However, for a small number of individuals, retaining a portion of the current gear restricted area or expanding the gear restricted area would not optimize the ability to harvest target species quotas. The Cape Hatteras Gear Restricted Area is situated in a location where wintertime fishing activities are largely dependent on weather and wind direction. Cape Hatteras and the adjacent Diamond Shoals shelter fishing grounds to the south and west from northerly and westerly winds, and to the north from southerly and westerly winds. Retaining the Cape Hatteras Gear Restricted Area absent any identifiable, science-based conservation benefit reduces operational flexibility of fishermen to safely conduct fishing activities in short, favorable wintertime weather windows.

3 Description of Affected Environment

This chapter describes the affected environment (the fishery, the gears used, the communities involved, *etc*.), and provides a view of the current condition of the fishery, which serves as a baseline against which to compare potential impacts of the different alternatives. This chapter also provides a summary of information concerning the biological status of the bluefin tuna stock; the marine ecosystems in the fishery management unit; the social and economic condition of the fishing interests, fishing communities, and fish processing industries; and the best scientific information available concerning the past, present, and possible future condition of bluefin tuna stocks, ecosystems, and fisheries. Where possible, tables and figures have been updated from the DEIS, which primarily included data through 2017, with 2018 data. NMFS has indicated such updates in the figure captions in figure captions that specify date ranges (i.e., including 2018 data) and/or in footnotes that specify new data sources.

3.1 Summary of Atlantic Highly Migratory Species Management

The authority to manage Atlantic HMS fisheries has been designated to NMFS by the Secretary of Commerce. The HMS Management Division develops regulations for Atlantic HMS fisheries within NMFS. HMS fisheries require management at the international, national, and state levels because of their highly migratory nature. NMFS manages HMS fisheries in federal waters (domestic) and the high seas (international), while individual states establish regulations for some HMS in their own waters. However, there are exceptions to this generalization. For example, as a condition of their permit, federally-permitted HMS fishermen are generally required to follow federal regulations in all waters (including state waters). However, if a state has more restrictive regulations than the federal regulations, the state regulations may prevail.

While NMFS does not generally manage HMS fisheries in state waters, states are invited to send representatives to HMS Advisory Panel meetings and to participate in stock assessments, public hearings, or other fora. NMFS continues to work on improving its communication and coordination with state agencies and welcomes comments from states about various pelagic longline fishery measures. To the extent practicable, NMFS works with states, Councils, and the Fisheries Commissions to ensure complementary regulations are implemented across jurisdictions.

On the international level, the United States participates in meetings of the ICCAT and in stock assessment conducted by its Standing Committee on Research and Statistics (SCRS). NMFS implements conservation and management measures adopted by ICCAT and through other relevant international agreements, consistent with ATCA and the Magnuson-Stevens Act. ICCAT has assessed numerous stocks, and has conducted several ecological risk assessments for various HMS species, among other things. Stock assessments and management recommendations are listed on ICCAT's website. International cooperation is critical to the effective conservation and management of bluefin tuna stocks (western Atlantic and eastern Atlantic/Mediterranean), given the species' highly migratory nature. ICCAT conservation and management occurs both through stock assessments and recommendations.

3.1.1 Atlantic HMS Stock Status

The term "stock of fish" means a species, subspecies, geographical grouping or other category of fish capable of management as a unit (Magnuson-Stevens Act §3(42)). "Stock" may also refer to a multispecies complex managed as a single unit due to the occurrence of two or more species being harvested together. Stock assessments measure the impact of fishing and on stocks and project harvest levels that maximize the number of fish that may be caught while preventing overfishing, and where necessary, rebuilding depleted stocks. The thresholds that NMFS uses to determine the status of Atlantic HMS are presented in Figure 3.1. These thresholds are fully described in Chapter 3 of the 1999 HMS FMP (64 FR 29090; May 28, 1999) and in Amendment 1 to the Billfish FMP (64 FR 29090; May 28, 1999), and were carried over in full in the 2006 Consolidated HMS FMP (71 FR 58058; October 2, 2006). These thresholds are based on those described in a paper providing the initial technical guidance for implementing National Standard 1 of the Magnuson-Stevens Act (Restrepo et al. 1998).

Images like Figure 3.1 are often used by stock assessment scientists to summarize the results of various stock assessment models. Generally, if the model results are in the white portion of the figure, a stock may have a status of "not overfished" and "overfishing is not occurring." Similarly, if the model results are in the gray portions of the figure, a stock may have a status of "overfished," "overfishing is occurring," or both.

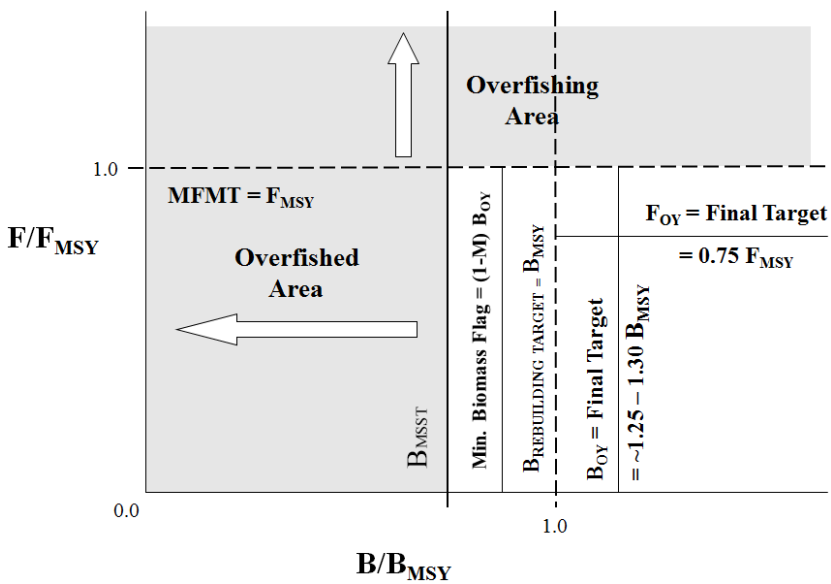

Figure 3.1 Illustration of the Status Determination Criteria and Rebuilding Terms

In summary, a stock is considered "overfished" when the current biomass (B) is less than the biomass for the minimum stock size threshold ($B < B_{MSST}$). The minimum stock size threshold (MSST) is determined based on the natural mortality of the stock and the biomass at maximum sustainable yield (B_{MSY}). Maximum sustainable yield (MSY) is the maximum long-term average yield that can be produced by a stock on a continuing basis. The biomass can fall below the B_{MSY} without causing the stock to be declared "overfished" as long as the biomass is above B_{MSST}. If a stock is declared overfished, action to rebuild the stock is required by law. A stock is considered rebuilt when B is greater than B_{MSY}. It is important to note that ICCAT uses different thresholds for the overfished stock status determination. ICCAT defines an overfished status as B_{year} relative to B_{MSY}, while the domestic definition of an overfished status is B_{year} relative to B_{MSST}.

A stock may be determined as "overfishing may be occurring" if the current fishing mortality (F) is greater than the fishing mortality at MSY (F_{MSY}) ($F > F_{MSY}$). In the case of F, the maximum fishing mortality threshold is F_{MSY}. Thus, if F exceeds F_{MSY}, overfishing is occurring and action to end overfishing is required by law. The same status determination criteria for overfishing are applied by ICCAT and NMFS for HMS.

A stock is considered healthy when B is greater than or equal to the biomass at optimum yield (B_{OY}) and F is less than or equal to the fishing mortality at optimum yield (F_{OY}).

The domestic thresholds used to calculate the status of Atlantic HMS as described in the 1999 FMP and Amendment 1 to the Atlantic Billfish FMP are:

- Maximum Fishing Mortality Threshold (MFMT) = $F_{limit} = F_{MSY}$.
- Overfishing is occurring when $F_{year} > F_{MSY}$.
- Minimum Stock Size Threshold (MSST) = B_{limit} = (1-M) BMSY when M < 0.5 or MSST = $0.5B_{MSY}$ when M ≥ 0.5, M = natural mortality. Formula exceptions include blue marlin ($0.9B_{MSY}$), white marlin ($0.85B_{MSY}$), and west Atlantic sailfish ($0.75B_{MSY}$). In many cases an average M across age classes or sensitivity runs from a stock assessment model is used to calculate MSST. Domestically, an overfished status is defined as B_{year} relative to $B_{MSST.}$
- Biomass target during rebuilding = B_{MSY}.
- Fishing mortality during rebuilding < F_{MSY}.
- Fishing mortality for healthy stocks = $0.75F_{MSY}$ (Final target = F_{OY}).
- Biomass for healthy stocks = $B_{OY} \approx 1.25$ to $1.30B_{MSY}$.
- Minimum biomass flag = $(1\text{-}M)B_{OY}$.
- Level of certainty of *at least* 50 percent but depends on species and circumstances.
- For some stocks (e.g., bluefin tuna, albacore), spawning stock biomass (SSB) is used as a proxy for biomass.
- For sharks, in some cases, spawning stock fecundity (SSF) or number of fish (N) can be used as a proxy for biomass since biomass does not influence pup production in sharks. SSF is the sum of the number of mature sharks at age multiplied by pup-production at age.

NMFS annually provides a current list of the status of Atlantic HMS in the HMS Stock Assessment and Fishery Evaluation (SAFE) Report, which may be downloaded at the Atlantic HMS website. See Table 2.1 in the most recent SAFE Report for a complete list of stock status summaries. Table 3.1 below summarizes the most recent stock status information for target and bycatch species in the pelagic longline fishery. Most of the information presented is from the 2018 SAFE Report (NMFS 2019); however, the stock status for white marlin and roundscale spearfish has been updated from the DEIS to the FEIS to reflect the most recent stock assessments completed by the ICCAT SCRS. In preparing this action and considering alternatives, NMFS considered relevant information in the most recent stock assessments for each of the stocks listed below.

For the quota-managed stocks listed below, including western Atlantic bluefin tuna and North Atlantic swordfish, the actions considered and analyzed in this FEIS would not affect or alter the science-based quotas for the stocks. Only the time and place (i.e., for gear restricted area/closed area alternatives), and/or manner (i.e., gear/weak hooks) in which the allowable quotas are caught could be affected. Any action considered would manage stocks within the allowable catch levels. For these stocks, NMFS has implemented the quotas through rulemaking with the appropriate

environmental analyses of the effects of quota implementation. Those rulemaking actions and analyses are not repeated here. They include:

- Final Rule on Atlantic Bluefin Tuna and Northern Albacore Tuna Quotas; Atlantic Bigeye and Yellowfin Tuna Size Limit Regulations (83 FR 5139, October 11, 2018). In this final rule, NMFS modified the baseline annual U.S. quota and subquotas for bluefin tuna and the baseline annual U.S. North Atlantic albacore quota to reflect quotas adopted by ICCAT. Supporting documents, including the Environmental Assessment (EA), Regulatory Impact Review, and Final Regulatory Flexibility Analysis, may be downloaded from the HMS website at *www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species/*.
- 2012 Swordfish Quota Adjustment Rule (77 FR 45273; July 31, 2012). In this final rule, NMFS analyzed the North Atlantic swordfish quota and quota adjustment process in the EA, Final RIR, and FRFA that were prepared for the rule.

Table 3.1 Atlantic HMS Stock Status Summaries For Pelagic Longline Target (Swordfish and Yellowfin Tuna) and Bycatch (Bluefin Tuna, Blue Marlin, White Marlin, Sailfish, Shortfin Mako, Dusky) Species

Species	Current Relative Biomass Level	B_{MSY}	International Threshold	Domestic Minimum Stock Size Threshold	International Stock Status	Domestic Stock Status	Stock Assessment (Last Assessment Year)
Western Atlantic bluefin tuna	Unspecified*	Unspecified*†	B_{MSY}	0.86 SSB_{MSY}	Unspecified*	Unknown*	2017^
Atlantic yellowfin tuna	B_{2018}/B_{MSY} = 1.17 (0.75 - 1.62)	Unspecified †	B_{MSY}	0.5 B_{MSY} (age 2+)	Not overfished	Not overfished	2019
Atlantic bigeye tuna	B_{2017}/B_{MSY} = 0.59 (0.42 - 0.80)	Unspecified †	B_{MSY}	0.6 B_{MSY}	Overfished	Overfished	2018^
North Atlantic swordfish	B_{2015}/B_{MSY} = 1.04 (0.82 - 1.39)	82,640 t (51,580 - 132,010)	B_{MSY}	0.8 B_{MSY} (66,112 t)	Not overfished	Not overfished	2017
Blue marlin	SSB_{2016}/SSB_{MSY} = 0.69 (0.52 - 0.91)	Unspecified †	B_{MSY}	0.9 B_{MSY}	Overfished	Overfished	2018
White marlin (and roundscale spearfish)	B_{2017}/B_{MSY} = 0.58 (0.27 - 0.87)	Unspecified †	B_{MSY}	0.85 B_{MSY}	Overfished	Overfished	2019^^
West Atlantic sailfish	SSB_{2014}/SSB_{MSY} = 1.81 (0.51-2.57) ‡ SSB_{2014}/SSB_{MSY} = 1.16 (0.18-1.69)‡‡	1,438-1,636 t ‡,‡‡	B_{MSY}	0.75 B_{MSY}	Not likely overfished	Not overfished—rebuilding	2016
North Atlantic shortfin mako sharks	B_{2015}/B_{MSY} = 0.57 - 0.95	62,555 t - 123,475 t †††	B_{MSY}	(1-M) B_{MSY}‡‡*	Overfished	Overfished	2017
Dusky sharks	SSF_{2015}/SSF_{MSY} = 0.41 - 0.64	Unknown†	NA	(1-M) SSB_{MSY}	NA	Overfished	2016

*In the 2017 stock assessment, the SCRS indicated that it is not possible to calculate biomass-based reference points (e.g., BMSY) absent additional knowledge (or basis for assumptions) about how future recruitment potential relates to spawning stock biomass.
†A value for BMSY (or its proxy) was not provided in the stock assessment.
††There is insufficient information to estimate how many years it will take this stock to rebuild.
†††Only the BSP2-JAGS and JABBA models provided BMSY values in biomass. The BMSY range encompasses the 8 scenarios run of the BSP2-JAGS and JABBA models. The SS3 model provided BMSY values in numbers.
‡Stock Synthesis estimate based on increasing CPUE trends, with approximate 95% confidence intervals.
‡‡Stock Synthesis estimate based on decreasing CPUE trends, with approximate 95% confidence intervals.
‡‡*M is unknown.
^Upcoming assessments scheduled for 2020 (bluefin tuna), and 2023 (bigeye tuna)
^^ New information from the 2019 SCRS Report

3.2 Description and Management of the Pelagic Longline Fishery

The pelagic longline fishery for Atlantic HMS primarily targets swordfish, yellowfin tuna, and bigeye tuna in various areas and seasons. Secondary target species include dolphin (*Coryphaena hippurus*), skipjack tuna, and albacore tuna. Although this gear can be modified (e.g., depth of set, hook type, hook size, bait) to target swordfish, tunas, or other fish, it is generally a multi-species fishery. These vessel operators are opportunistic, switching gear style and making subtle changes to target the best available economic opportunity on each individual trip. Pelagic longline gear sometimes attracts and hooks non-target finfish with little or no commercial value as well as species that cannot be retained by commercial fishermen due to regulations. For example, the pelagic longline fishery interacts with multiple managed or restricted bycatch species, including bluefin tuna, shortfin mako, dusky shark, sandbar shark, and billfish. Pelagic longline gear may also interact with protected species such as marine mammals, sea turtles, and seabirds. Thus, this gear has been classified as a Category I fishery with respect to the MMPA. Any species (or undersized catch of permitted species) that cannot be landed due to fishery regulations are required to be released, regardless of whether the catch is dead or alive.

Pelagic longline gear is composed of several parts (Figure 3.2). The primary fishing line, or mainline of the longline system, can vary from five to 40 miles in length, with approximately 20 to 30 hooks per mile. The depth of the mainline is determined by ocean currents and the length of the floatline. The floatline connects the mainline to several buoys and periodic markers which can have radar reflectors or radio beacons attached. Each individual hook is connected by a leader, or gangion, to the mainline. Lightsticks, which contain light emitting chemicals, are used, particularly when targeting swordfish. When attached to the hook and suspended at a certain depth, lightsticks attract baitfish, which may, in turn, attract pelagic predators (NMFS 1999).

When targeting swordfish, pelagic longline gear is generally deployed at sunset and hauled at sunrise to take advantage of swordfish nocturnal, near-surface feeding habits (NMFS 1999). In general, longlines targeting tunas are set in the morning, fished deeper in the water column, and hauled back in the evening. Except for vessels of the distant water fleet, which undertake extended trips, fishing vessels preferentially target swordfish during periods when the moon is full to take advantage of increased densities of pelagic species near the surface.

Figure 3.2 and Figure 3.3 illustrate basic differences between swordfish (shallow) and tuna (deep) pelagic longline sets. Swordfish sets are buoyed to the surface, have fewer hooks between floats, and are relatively shallow. This same type of gear arrangement is used for mixed target species sets. Tuna sets use a different type of float placed much further apart. Compared with swordfish sets, tuna sets have more hooks between the floats and the hooks are set much deeper in the water column. It is believed that tuna sets hook fewer turtles than the swordfish sets because of the difference in fishing depth. In addition, tuna sets use bait only, while swordfish sets use a combination of bait and lightsticks. Compared with vessels targeting swordfish or mixed species, vessels specifically targeting tuna are typically smaller and fish different grounds.

Regulations for the U.S. Atlantic pelagic longline fishery include minimum sizes for swordfish, yellowfin tuna, bigeye tuna, and bluefin; gear and bait requirements; limited access vessel permits; an IBQ program to limit incidental take of bluefin tuna; gear restricted areas; closed areas; observers, protected species incidental take limits; reporting requirements (including logbooks); mandatory workshop requirements; regional quotas for swordfish; and shark landings restrictions. The retention of billfish by commercial vessels, or the sale of billfish from the Atlantic Ocean, is

prohibited. As a result, all billfish caught on pelagic longline gear must be released or discarded, and are considered bycatch. Many of the management strategies implemented have a spatial component. For example, some gear requirements are designated for certain areas (e.g., weak hooks in the Gulf of Mexico, certain gear and bait combination requirements for the Northeast Distant Area (NED)). The pelagic longline fishery is also bound to certain other regulations under the Magnuson-Stevens Act and other laws. For example, in 2016 President Barack Obama created the Northeast Canyons and Seamounts Marine National Monument, which protects pristine deep marine ecosystems, under authority of the Antiquities Act of 1906. All commercial fishing, excluding red crab and lobster fisheries, is prohibited. Atlantic HMS pelagic longline vessels may not possess commercial fishing gear within the boundaries of the monument, except when the gear is stowed and not available for immediate use during passage without interruption through the monument.

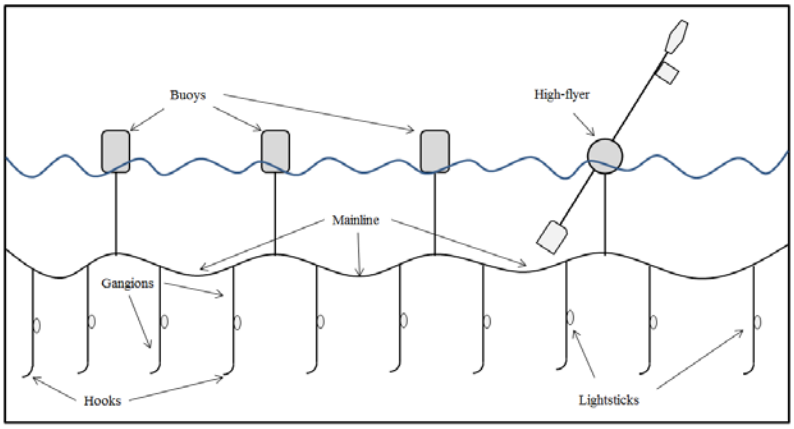

Figure 3.2 Typical U.S. Pelagic Longline Gear
Source: Redesign from original in Arocha (1997).

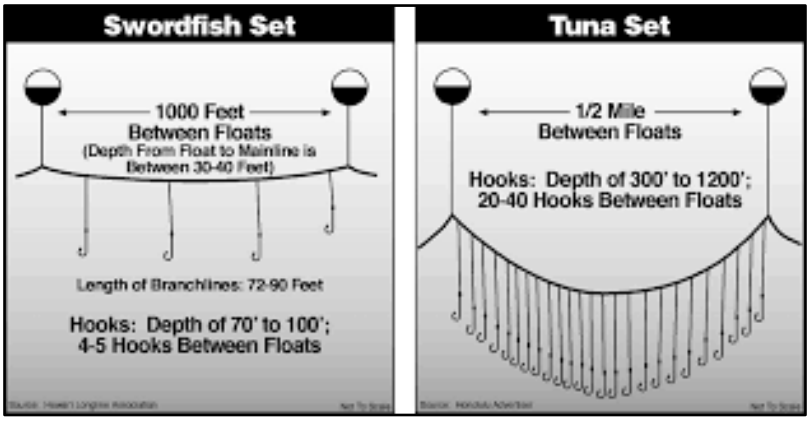

Figure 3.3 Pelagic Longline Gear Deployment Techniques
Note: This figure is only included to show basic differences in pelagic longline gear configuration and to illustrate that this gear may be altered to target different species.
Source: Hawaii Longline Association and Honolulu Advertiser.

3.2.1 Bluefin Tuna Management History

This section provides a brief overview of Atlantic HMS management on the domestic and international level along with recent information on the Atlantic bluefin tuna fishery.

3.2.1.1 Domestic Management

Atlantic HMS fisheries are managed under the dual authority of the Magnuson-Stevens Act and ATCA. Under the Magnuson-Stevens Act, NMFS must manage fisheries to maintain optimum yield on a continuing basis while preventing overfishing.

The Atlantic bluefin tuna fishery is a quota-managed fishery, and catch (landings and dead discards) must be accounted for within the available U.S. quota. The annual U.S. bluefin quota (set by ICCAT) is allocated domestically among seven quota categories, including two incidental categories, the Longline and Trap categories, as well as the categories that direct on bluefin (General, Angling, Harpoon, and Purse Seine) and a Reserve category, used for research and inseason quota transfers as warranted. Because the pelagic longline fishery primarily targets swordfish, yellowfin tuna, and bigeye tuna, and incidentally catches bluefin as bycatch, the Longline quota category provides the pelagic longline fishery with bluefin quota to account for that bycatch. The amount of quota allocated to each category is expressed in NMFS regulations as a percentage of the U.S. quota.

Prior to the 2015 implementation of the IBQ Program, the Longline category was allocated 8.1 percent of the total U.S. quota for landings. Pelagic longline vessels were limited in the number of bluefin they could retain per trip (based on the amount of target species catch), and only landings counted toward the Longline quota. Vessels could retain one, two, or three bluefin if they had 2,000 lb, 6,000 lb, or 30,000 lb of target catch, respectively. Bluefin caught in excess of this limit were required to be discarded. The category quota did not include an allowance for dead discards. Discards by the pelagic longline fishery were estimated annually and accounted for within the overall U.S. quota. Prior to the implementation of Amendment 7 and its IBQ Program, annual Longline category catches (landings plus dead discards) of bluefin had significantly exceeded the Longline category quota for several years. Because the amount of quota allocated to the Longline category did not reflect the larger amount of catch including dead discards, NMFS had to rely on underharvest from other quota categories and annual quota adjustments to account for dead discards, to ensure that the United States remained within its annual bluefin quota. In some years, the activity of only a few pelagic longline vessels constituted the majority of the category quota overharvests. It became apparent through discussions with the HMS Advisory Panel and various data analyses that measures focused more on individual vessel accountability, versus fleet level accountability, would be needed to help realign the pelagic longline fleet catch to the Longline category quota and that the category quota allocations should be re-examined.

Therefore, the IBQ Program and EM were implemented in the pelagic longline fishery in the Atlantic and Gulf of Mexico in 2015 by Amendment 7. Amendment 7 also implemented substantial changes to the management of bluefin that affected all participants/categories in the bluefin fisheries (both directed categories and those with bluefin bycatch). The most sweeping regulations were those affecting the pelagic longline fishery to reduce interactions with bluefin and provide vessel-level accountability. For example, EM requirements were implemented to provide NMFS a means to verify the accuracy of counts and identification of bluefin reported by the vessel owner/operator. In addition to implementing the IBQ Program, Amendment 7 implemented changes to the category quotas. Amendment 7 included an increase to the Longline category quota and increased management flexibility for transfers among quota categories through the Reserve category quota, as well as new gear restricted areas in the Atlantic (and performance metrics for accessing this

area) and Gulf of Mexico designed to reduce bluefin interactions. As discussed in Section 3.5.2.3, on September 30, 2019, NMFS released a formal review of the IBQ Program. The intent of the Three-Year Review of the IBQ Program was to evaluate the IBQ Program's effectiveness in meeting its goals and objectives.

3.2.1.2 International Management of Bluefin Tuna

ICCAT, with its 53 contracting parties, manages tuna and tuna-like species in the Atlantic Ocean and its adjacent seas and also conducts research and has adopted measures related to tuna species caught in association with ICCAT fisheries. ICCAT meets annually and adopts binding recommendations and non-binding resolutions that are intended to achieve ICCAT Convention management goals and objectives[3]. ICCAT recommendations are binding instruments for Contracting Parties, while ICCAT resolutions are non-binding and express the will of the Commission. ATCA authorizes the Secretary to promulgate regulations as may be necessary and appropriate to implement binding ICCAT measures. The authority to issue regulations under the Magnuson-Stevens Act and ATCA has been delegated from the Secretary to the Assistant Administrator for Fisheries, NMFS.

Atlantic bluefin tuna are managed by ICCAT as western and eastern stocks separated by a management boundary at the 45° W meridian. The two-stock hypothesis was supported by NMFS' 2011 ESA Status Review of Atlantic Bluefin Tuna (ABT SRT 2011).[4] Further evidence of meta- or subpopulations for each stock was considered; however, the SRT found the only conclusive evidence (under ESA definitions) was for two differentiated stocks (i.e., Mediterranean and Gulf of Mexico). The SRT acknowledged evidence suggesting that there may be two discrete populations within the Mediterranean, but did not have enough information to determine the significance of these populations to the species as a whole.

In 2017, ICCAT adopted Recommendation 17-06 to establish interim conservation and management measures for 2018 through 2020 for the western Atlantic bluefin tuna stock, including establishing a total allowable catch (TAC) of 2,350 t (an increase of approximately 17 percent). This recommendation was adopted to be responsive to a 2017 SCRS stock assessment while recognizing the need for a transition between the 20-year rebuilding program adopted in 1998 and a future approach to managing the stock that relies on management procedures to meet ICCAT Convention objectives (i.e., to maintain populations at levels that will support maximum sustainable yield). Rather than continue to use divergent high and low recruitment scenarios based upon biomass reference points that had dominated past assessments, SCRS decided to use an approach relying on fishing mortality rate, using a rate of $F_{0.1}$ as a proxy for biomass-based reference points.

Application of the western bluefin tuna allocations among Contracting Parties, Cooperating non-Contracting Parties, Entities, and/or Fishing Entities (CPCs), the percentages of which remained unchanged from the previous recommendation, resulted in a total U.S. quota of 1,272.86 t, including 25 t for bycatch related to pelagic longline fisheries in the vicinity of the NED boundary. The Recommendation also details work to be undertaken by ICCAT and its scientific body toward the

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[3] All ICCAT recommendations and resolutions are available on the ICCAT website: https://www.iccat.int/en/

[4] On May 24, 2010, the Center for Biological Diversity petitioned NMFS to list Atlantic bluefin tuna as endangered or threatened under the Endangered Species Act (ESA). NMFS evaluated the petition as required by the ESA, determined that the petitioned action may be warranted, and published a positive 90-day finding (75 FR 57431). A Status Review was conducted under the requirements of the ESA and published on May 20, 2011.

anticipated adoption of management procedures, including a harvest control rule, for western Atlantic bluefin tuna by 2020. For eastern Atlantic and Mediterranean bluefin tuna, Recommendation 17-07 increased the TAC for 2018-2020. Management measures for the eastern fishery were updated in 2018 with Recommendation 18-02, and in 2019 with Recommendation 19-04.

3.2.2 Bluefin Tuna Spatial and Gear Management: Closed Areas, Gear Restricted Areas, and Weak Hooks

In general, Atlantic HMS fishery participants may be required to comply with a number of different types of fishery closures, depending on the combination of permits held. These may include closures or restricted areas for Council-managed species, Habitat Areas of Particular Concern, National Monuments, and National Marine Sanctuaries, among other things.

As previously described, pelagic longline is a heavily managed gear type and is strictly monitored. Because it is difficult for pelagic longline fishermen to avoid undersized or prohibited fish in some areas, NMFS incorporates "spatial management" in the form of area closures or gear restricted areas in the Gulf of Mexico and along the U.S. East Coast (Figure 3.4) as a component of effective fisheries management. The intent of some closures was to decrease bycatch in the pelagic longline fishery by closing areas with the highest bycatch rates. Those that are intended to specifically reduce bycatch of bluefin tuna are discussed in greater detail below, and are the focus of this rulemaking.

There are also time/area closures or gear restricted areas for pelagic longline gear that were designed to reduce bycatch in the fishery including bycatch of some HMS (e.g., undersized swordfish) and sea turtles. Management options for these areas are not being considered in this action because they are not areas specifically created to manage bluefin tuna interactions and dead discards. A separate NMFS action also is underway, titled "Research and Data Collection in Closed and Gear Restricted Areas in Support of Spatial Fisheries Management", with the scoping phase completed in July 2019, to consider approaches to collect data and perform research in areas that are currently closed to certain gears or fishing activities for Atlantic HMS. Such research will help evaluate and support spatial fisheries management for Atlantic HMS in the future.

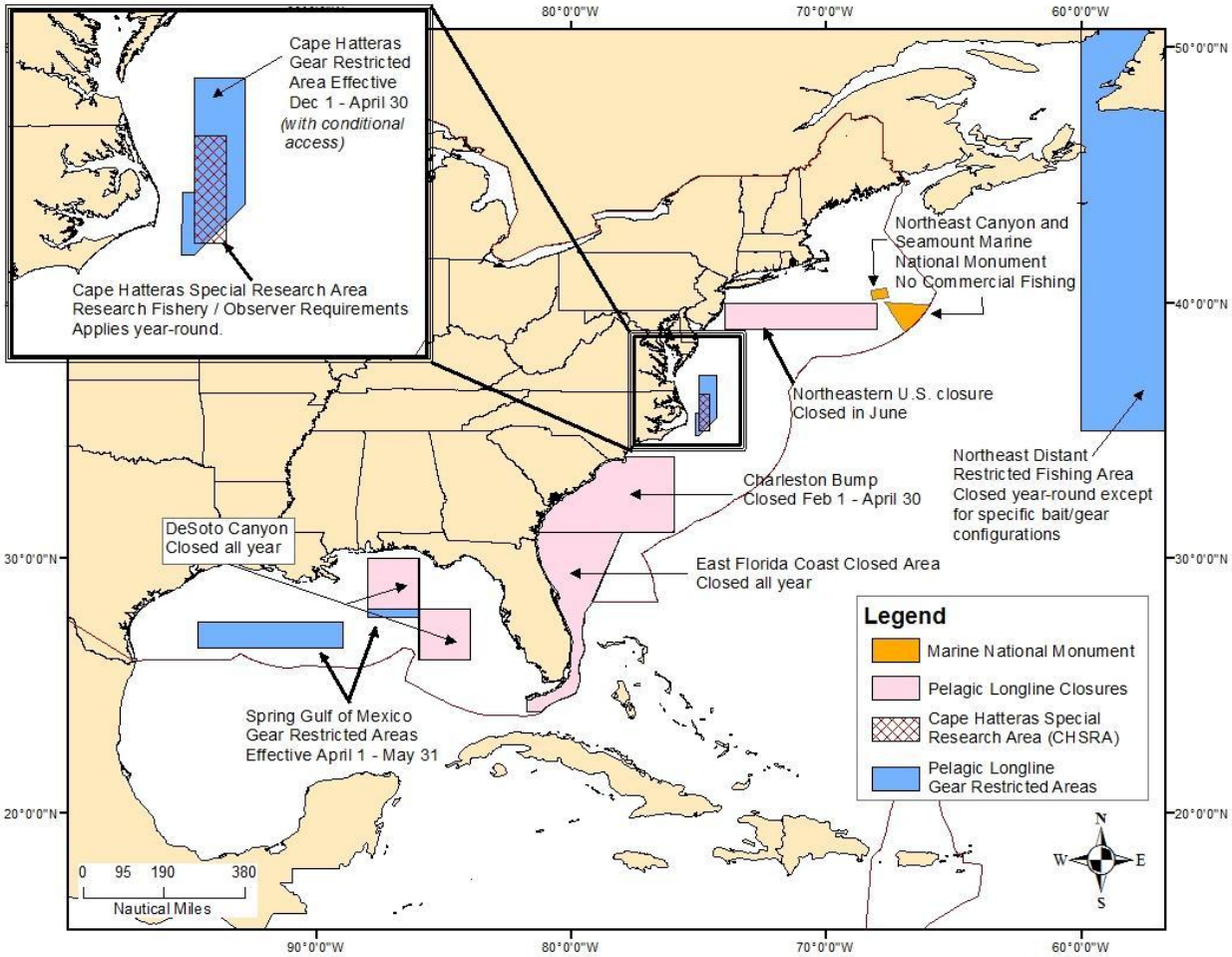

Figure 3.4 Examples of Current Spatially Managed Areas That Prohibit or Restrict Pelagic Longline Fishing by U.S. Flagged Vessels

3.2.2.1 Northeastern United States Closed Area

The Northeastern United States Closed Area was implemented through the 1999 HMS FMP to reduce bluefin tuna discards in the pelagic longline fishery. NMFS determined that the western Atlantic bluefin tuna stock was overfished in 1997 and a rebuilding plan was adopted by ICCAT in 1998. In addition, the 1998 ICCAT Recommendation on western Atlantic bluefin tuna set a country-specific dead discard allowance and required that all Contracting Parties, including the United States, minimize dead discards of bluefin tuna to the extent practicable. Given the status of bluefin tuna and recommendations from ICCAT, at that time, NMFS investigated a range of different time/area options for locations with high bluefin tuna bycatch in the 1999 HMS FMP for Atlantic tunas, sharks, and swordfish. NMFS finalized the Northeastern United States Closed Area based on a redistribution analysis (disbursement analysis in the Final EIS) that showed that a closure during the month of June could reduce bluefin tuna discards by 55 percent in this area, without any substantial changes to target catch or other bycatch levels. This area, located off the coast of New Jersey (Figure 3.4), has since been closed from June 1 through June 30 each year). Considerable fishing effort with pelagic longline gear has been occurring on the outer seaward edges of this Closed Area for the past 20 years. NMFS initially considered changes to the Northeastern United States Closed Area during the scoping process for Amendment 7, but did not include actions for that area in the Amendment 7 rulemaking. Although no comments were received specific to the NE

closure option during Amendment 7 scoping, there was general support for reducing the size and time of closed areas where possible.

3.2.2.2 Cape Hatteras Gear Restricted Area

The Cape Hatteras Gear Restricted Area is located off the coast of North Carolina and is effective from December through April. The Cape Hatteras Gear Restricted Area was effective as of January 1, 2015, with the finalization of Amendment 7. The primary objectives of considering pelagic longline gear restricted areas in Amendment 7 were to reduce bluefin interactions, thereby decreasing the potential for dead discards, and to optimize fishing opportunity consistent with National Standard 8 by taking into account the importance of fishery resources to fishing communities, National Standard 9 by reducing bycatch and bycatch mortality, to the extent practicable, and National Standard 4 by selecting measures that do not discriminate between residents of different states. This gear restricted area was designed based upon the identification of areas with relatively high bluefin interaction rates with pelagic longline gear based on HMS logbook and observer data.

The effectiveness of gear restricted areas depends upon the defined area and time of the restriction(s) coinciding with the presence of bluefin in the area(s), the availability of the target species outside of the gear restricted area(s), the presence of bluefin outside the gear restricted area(s), annual variability in bluefin interactions, environmental conditions that may drive the distribution of bluefin (e.g., the Gulf Stream), and other factors that affect the feasibility of fishing for the target species outside of the gear restricted area(s). For example, fishing opportunities may be reduced in gear restricted areas if vessels cannot relocate to nearby areas during that time (e.g., nearby areas are already heavily fished, or are inaccessible due to cost or safety concerns). A successful gear restricted area would balance the ecological benefits of the restriction, in this case the reduction in interactions resulting in dead discards and minimizing interactions with protected/restricted resources, with the economic costs (e.g., reduction in pelagic longline fishing opportunity for target species, increased costs of accessing other areas). The Cape Hatteras Gear Restricted Area was also designed to accommodate fishing practices of vessels that were excluded from the area or chose to fish outside of the area. The Gulf Stream moves from a southwest to a northeast direction just south of the gear restricted area. The final area implemented reflected a compromise to allow fishermen to set gear just to the south of the gear restricted area, with the expectation that prevailing currents would push gear near, but not through, the gear restricted area. Without this accommodation, fishermen would have lost access to productive fishing grounds that were adjacent to the gear restricted area. NMFS concluded that this access would not affect the needed conservation and management benefit of the area.

Historically, the majority of interactions with bluefin tuna occurring in the Cape Hatteras Gear Restricted Area were limited to a few pelagic longline participants. Through Amendment 7, pelagic longline vessel fishing access to this gear restricted area was conditioned on the satisfaction of certain performance metrics. This approach was intended to hold fishermen individually accountable for their bluefin interactions, as opposed to holding the entire fleet responsible for high interactions by a small number of fishermen, and grant "qualified" vessels access to the area. A "qualified" vessel is one that has been issued, or is required to have been issued, an Atlantic tunas limited access longline permit (and other associated permits as required) and have demonstrated an ability to avoid bluefin and comply with reporting and monitoring requirements associated with the performance metric system. Vessels would be evaluated based on criteria (i.e., performance metrics) evaluating their ability to avoid bluefin tuna, compliance with Pelagic Observer Program requirements, and compliance with HMS logbook submission requirements using the three most recent years of available data associated with a vessel. If no data were available, then NMFS would

not be able to make a determination about vessel access, and such vessels would be excluded from gear restricted area access until NMFS has collected sufficient data for assessment. Those vessels that meet the criteria for performance metrics would be allowed to fish in the closed area. The use of other authorized gears besides pelagic longline, such as buoy gear, green-stick gear, or rod and reel gear, can be fished in the gear restricted area regardless of the vessel's performance metric score provided the vessel abides by any rules/regulations that apply to these gear types and pelagic longline gear is not onboard the vessel.

Data collections to support analysis of performance metrics have enabled NMFS to observe the fleet's responsiveness to management goals since implementation. NMFS has observed some positive trends with respect to bluefin avoidance across the fleet. For example, the fleet-wide average bluefin-to-target species ratio, indicative of the number of bluefin interactions per 10,000 lb of target species landings per vessel, has decreased from 1.60 (data analyzed for the 2014-2015 effective period) to 0.91 (data analyzed for the 2018-2019 qualifying period) (Table 3.2). The lowest bluefin to target species ratios (0.65) were observed in data analyzed for the 2016-2017 effective period, i.e., data reported to the agency between 2013 and 2015. This constituted a period of great uncertainty for fishery participants, since NMFS published the Amendment 7 proposed and final rules in 2013 and 2014 and Amendment 7 measures were implemented in 2015. There was comparatively low fishing activity in 2015 due to participants adjusting to the new regulations.

NMFS has also observed some positive trends with respect to compliance. Across the life of the program, vessel compliance with Pelagic Observer Program communication requirements increased from 89 percent to 94 percent. Similarly, the number of days on average it took fishery participants to submit logbook reports decreased by 52 percent. Data from vessels that fished in the Gear Restricted Area suggest that these participants have maintained low bluefin interactions and high compliance with reporting and observer requirements (Table 3.3).

Table 3.2 Fleet-Wide Pelagic Longline Bluefin Avoidance and Compliance Trends

Effective Period	Average Bluefin: Target Species Landings Ratio	Average Percent of Trips Compliant per Vessel (%)	Average # of Days to Submit Logbook Reports
2014–2015	1.60	89.08	46.18
2015–2016	0.75	91.00	35.16
2016–2017	0.65	93.48	23.77
2017–2018	0.88	95.30	24.53
2018–2019	0.91	94.76	22.63
2019-2020	1.22	94.50	27.50

Table 3.3 Performance Trends for Vessels that Fished in the Cape Hatteras Gear Restricted Area During Its Effective Periods, Dec–April (Averaged per Vessel)

GRA Effective Period	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019-2020
Logbook data considered in analysis	2006–2012	2012–2014	2013–2015	2014–2016	2015–2017	2016-2018
Bluefin: target species ratio	3.72	0.77	0.70	0.85	1.04	1.61
Percent of trips compliant with POP	87.96	95.04	97.47	99.48	98.37	95.61
# days to submit logbooks	44.29	28.18	18.82	20.44	12.60	15.90
Target species landings	636,190	348,953	296,479	300,397	312,515	286,363
Number of vessels that fished in GRA*	20	15	26	24	22	26

*Data not averaged, equivalent to the number of vessels that fished in the GRA during the years analyzed for an effective period. E.g., 15 vessels granted access in 2015-2016 fished in the GRA between 2012 and 2014.

3.2.2.3 Spring Gulf of Mexico Gear Restricted Area

The Spring Gulf of Mexico Gear Restricted Area consists of two areas in the Gulf of Mexico (one in the central Gulf of Mexico and the second in the eastern Gulf of Mexico). Unless gear is properly stowed, access to these areas for vessels fishing with pelagic longline gear during the two-month period from April through May each year is prohibited. NMFS implemented the Spring Gulf of Mexico Gear Restricted Area in order to reduce dead discards and protect bluefin tuna on spawning grounds. The Gulf of Mexico is the only known spawning ground for western Atlantic bluefin tuna.

The primary objectives of considering pelagic longline gear restricted area under Amendment 7 were to reduce bluefin interactions, thereby decreasing the potential for dead discards, and to optimize fishing opportunity. The gear restricted area was designed based upon the identification of areas with relatively high bluefin interaction rates with pelagic longline gear based on HMS logbook and observer data. The effectiveness of a gear restricted area depends upon the defined area and time of the restriction(s) coinciding with the presence of bluefin in the area(s), the availability of the target species outside of the gear restricted area(s), the presence of bluefin outside the gear restricted area(s), annual variability in bluefin interactions, environmental conditions that may drive the distribution of bluefin (e.g., the Gulf Stream), and other factors that affect the feasibility of fishing for the target species outside of the gear restricted area(s). For example, fishing opportunities may be reduced in gear restricted areas if vessels cannot relocate to nearby areas during that time (e.g., nearby areas are already heavily fished, or are inaccessible due to cost or safety concerns). Ideally, successful gear restricted areas balance the conservation and management need for and ecological benefits of the restriction, such as reducing interactions resulting in dead discards and minimizing interactions with protected/restricted resources, with the economic costs, such as reductions in pelagic longline fishing opportunity for target species, and increasing costs of accessing other areas.

The gear restricted area encompasses areas with historically elevated bluefin interaction in the eastern-central Gulf of Mexico. The gear restricted area in the Gulf of Mexico was also created to encompass a recent shift in pelagic longline fishing activity eastward. Between 2009 and 2012, there was a 10 to 20 percent shift from the Mid-Gulf Louisiana region to the eastern Gulf of Mexico region. In Amendment 7, NMFS considered whether it was appropriate to allow access via performance metrics, similar to what was implemented for the Cape Hatteras Gear Restricted Area. This process is intended to hold fishermen individually accountable for their interactions, as opposed to holding the entire fleet responsible for high interactions by a small number of fishermen. Performance based access was not anticipated to be effective in reducing bluefin tuna discards in the Gulf of Mexico, however. Analyses completed in Amendment 7 suggested that only a

very small number of vessels would be denied access, as interactions with bluefin in the Gulf of Mexico are more evenly distributed among all of the vessels fishing there (i.e., most vessels had small numbers of fish) and not concentrated among a few vessels as in the area off Cape Hatteras. Both Gulf of Mexico gear restricted areas are closed to pelagic longline gear from April 1 through May 31 annually. Each of these areas were identified as locations of high bluefin tuna concentrations and interactions with pelagic longline gear. Ultimately in Amendment 7, the Spring Gulf of Mexico Gear Restricted Area was closed to all vessels using pelagic longline gear onboard, instead of allowing performance-based access as in the Cape Hatteras Gear Restricted Area, because the distribution of interactions was more widespread across both the area of interest and fleet participants. Other gear types authorized for use by pelagic longline vessels, such as buoy gear, green-stick gear, or rod and reel, are allowed in these areas provided the vessel abides by any rules/regulations that apply to those gear types.

3.2.2.4 Weak Hooks in the Gulf of Mexico

A final rule to implement a requirement for the mandatory use of weak hooks in the Gulf of Mexico pelagic longline fishery published on April 5, 2011 (76 CFR 18653). A weak hook is a circle hook that meets NMFS' current size and offset restrictions for the Gulf of Mexico pelagic longline fishery but is constructed of round wire stock that is thinner gauge than the circle hooks currently used and is no larger than 3.65 mm in diameter. These hooks may allow incidentally hooked bluefin tuna to escape capture because the hooks are more likely to straighten when a large fish is hooked, while allowing the retention of smaller fish like swordfish and yellowfin tuna. The intent of this requirement was to reduce the bycatch of bluefin tuna; allow the long-term beneficial socioeconomic benefits of normal operation of directed fisheries in the Gulf of Mexico with minimal short-term negative socioeconomic impacts; and have both short- and long-term beneficial impacts on the stock status of Atlantic bluefin tuna. NMFS annually evaluates the impacts of the weak hook requirement in the HMS SAFE Report, using reported landings of major target species from the Gulf of Mexico (Table 3.4). Annual reported landings of swordfish and yellowfin tuna immediately following implementation of the weak hook requirement appeared to be on the rise but decreased in 2014-2015. Landings of yellowfin tuna and particularly swordfish increased in 2016. Bluefin interactions, reflected in the number of landings and discards, decreased since 2012.

NMFS also calculated mean reported landings for longer, multi-year time periods before (2007-2010) and after (2012-2016) implementation to identify whether landings, discards, and numbers of hooks deployed by pelagic longline fishery participants increased or decreased following implementation. The mean reported landings of albacore tuna were greater following implementation of weak hooks. The mean reported landings of swordfish, bluefin and bigeye tuna were lower in the years following implementation of the weak hook requirement. Mean yellowfin tuna landings were about the same before and after implementation. Discards of swordfish and bluefin tuna were lower after implementation, while blue marlin discards were slightly higher. White marlin discards were higher after implementation than prior to implementation, and average catch-per-unit effort increased by 77 percent. Nominal catch-per-unit effort (CPUE as expressed as catch per 1000 hooks) between the two time periods was also analyzed. The catch-per-unit of effort of swordfish, yellowfin, and albacore tuna kept was higher in 2012-2016 versus 2007-2010. The catch-per-unit effort of bluefin tuna kept and discards were lower in 2012-2016 as were the catch-per-unit efforts of swordfish discards and bigeye tuna kept. The catch-per-unit effort of bluefin tuna kept was 39.5 percent lower following weak hook implementation and the catch-per-unit effort of bluefin tuna discards were 38.9 percent lower. Blue marlin catch-per-unit effort was greater after the weak hook requirement went into effect.

Table 3.4 Reported Number of Hooks Fished and Landings of Major Target Species and Blue Marlin Interactions from the Gulf of Mexico (2007–2017)

Year	Hooks (x1000)	Swordfish	Bluefin	Yellowfin	Bigeye	White Marlin Discards	Swordfish Discards	Bluefin Discards	Blue Marlin Discards
2007	2,914.5	8,051	116	23,917	586	201	4,402	186	282
2008	2,368.4	6,155	100	14,640	250	224	3,583	254	277
2009	3,037.2	8,438	116	23,278	160	632	2,831	229	478
2010	1,005.8	3,003	65	5,265	133	39	1,000	123	58
2011*	1,334.7	5,464	23	13,512	30	175	1,882	19	152
2012	2,655.5	10,129	137	25,419	292	521	3,292	206	484
2013	2,312.2	9,143	44	17,593	180	281	2,022	67	279
2014	2,219.7	4,868	53	15,212	151	407	1,401	68	223
2015	1,465.5	2,304	17	9,877	189	335	1,036	31	229
2016	1,618.6	2,907	14	15,263	135	501	1,370	84	276
2017	1,533.4	4,227	23	13,495	308	414	1,805	29	391
2007–2010 mean	2,331.5	6,419.3	99.3	16,775	282.3	274.0	2,954	198	273.8
2012–2017 mean	1,967.5	5,596.3	48.0	16,143.2	209.2	409.8	1,821.0	80.8	313.7
2007–2010 CPUE		2.7501	0.0426	7.1950	0.1211	0.1175	1.2670	0.0849	0.1174
2012–2017 CPUE		2.8444	0.0244	8.2050	0.1063	0.2083	0.9255	0.0411	0.1594

*Weak hooks were implemented in 2011.
Source: HMS logbook data (2018 HMS SAFE Report).

3.3 Pelagic Longline Target and Bycatch Species Biology and Habitat

The following is a summary of habitats comprising Essential Fish Habitat (EFH) of Atlantic HMS target species and bluefin tuna, originally published in the 2006 Consolidated HMS FMP and updated in Amendment 10 to the 2006 Consolidated HMS FMP (2017).

Tuna, swordfish, and billfish distributions are most frequently associated with hydrographic features such as density fronts between different water masses and currents. The scales of these features may vary.

- On the largest scale, the North and South Equatorial currents occur in the U.S. Caribbean islands. The North Equatorial Current continues through the Caribbean Basin to enter the Gulf of Mexico through the Yucatan Straits. The current continues through the Florida Straits to join the other water masses (including the Antilles Current) to form the Gulf Stream along the eastern coast of the United States. Variations in flow capacities of the Florida Straits and the Yucatan Straits produce the Loop Current, the major hydrographic feature of the Gulf of Mexico. These water movements in large part influence the distributions of the pelagic life stages of Atlantic HMS.
- The river plume of the Mississippi River extends for miles into the Gulf of Mexico and is a predictable feature, depending on the season.
- Fronts that set up over the DeSoto Canyon in the Gulf of Mexico, or over the Charleston Bump or the Baltimore Canyon in the Mid-Atlantic, may be of a much smaller scale. The locations of many fronts or frontal features are statistically consistent within broad geographic boundaries. These locations are influenced by riverine inputs, movement of water masses, and the presence of topographic structures underlying the water column, thereby influencing the habitat of Atlantic HMS.

The continental shelf is characterized by depths ranging from a few meters to approximately 60 m (198 ft), with a variety of bottom habitat types. From the Scotian Shelf in the north, past Georges Bank and through the Mid-Atlantic Bight, a shelf-slope front exists. This hydrographic boundary separates the fresher, colder, and more homogeneous waters of the shelf and the horizontally stratified, warmer, and more saline waters of the continental slope. The shelf-slope front may act as a barrier to shelf-slope transfer of water mass and momentum.

From Nova Scotia to Cape Hatteras, 26 large valleys that originate on the shelf cut into the seafloor across the continental slope and rise. The current patterns in and around these submarine canyons promote significant biological productivity and diversity. Peak currents occur near the canyon heads and flow down the canyon, while currents at intermediate depths flow up the canyon. Water circulation may trap sediments in the canyon heads and produce conditions conducive to front development. Atlantic HMS are known to aggregate in the areas where these fronts form, most likely as productive feeding grounds.

The shelf area of the Mid-Atlantic Bight averages about 100 km (60 mi) in width, reaching a maximum of 150 km (90 mi) off New England near Georges Bank, and a minimum of 50 km (30 mi) offshore Cape Hatteras, North Carolina. Current speeds are strongest at the narrowest part of the shelf where wind-driven current variability is highest. The distribution of marine species, including HMS, along the Atlantic seaboard may be strongly influenced by currents, the warm Gulf Stream in the middle and south portions of the region, and generally by the combination of high summer and low winter temperatures.

The Mid-Atlantic area from Cape Cod, Massachusetts to Cape Hatteras, North Carolina represents a transition zone between northern cold-temperate waters of the north and the warm-temperate waters to the south. Water temperatures in the Mid-Atlantic vary greatly by season. Consequently, many of the fish species of importance in the Mid-Atlantic area migrate seasonally, whereas the major species in the other three areas are typically resident throughout the year (MMS, 1992; 1996). The shelf-edge habitat may range in water depth between 40 and 100 m (131 and 328 ft). The bottom topography varies from smooth sand to mud to areas of high relief with associated corals and sponges.

3.3.1 Bluefin Tuna Distribution and Migration

A thorough discussion of bluefin tuna life history is available in Amendment 10 to the 2006 Consolidated HMS FMP (82 FR 42329; September 7, 2017)(Amendment 10), which addressed EFH for Atlantic HMS. The information below summarizes migration and distribution information that is considered relevant to this action.

Bluefin tuna are highly migratory and in the Western Atlantic generally range from 45° N latitude to the equator, but have also supported short-term fisheries off Brazil and in the North Sea (Fromentin 2010). The recognized spawning grounds for the western Atlantic stock is the Gulf of Mexico. The prevailing assumptions have been that mature western bluefin tuna follow an annual cycle of foraging off the eastern United States and Canadian coasts from June through March. Bluefin tuna spawning from mid-April through June, mainly in the Gulf of Mexico, which is the only known spawning area for the western stock of Atlantic bluefin tuna. Protecting these fish during spawning can help the long-term rebuilding of the depleted bluefin tuna population. Although individuals may spawn more than once a year, it has generally been assumed that there is a single annual spawning period. However, recent tagging data and the presence of small (less than 235 cm curved fork length (CFL)) sexually mature females in the Gulf of Maine in June and July suggest that either individual bluefin tuna do not spawn on an annual cycle (Lutcavage et al. 1999; Block et al. 2005; Fromentin and Powers 2005; Goldstein et al. 2007), or a component of the western stock is spawning somewhere other than the Gulf of Mexico (e.g., in the central North Atlantic or Gulf Stream edge) (Mather et al. 1995; Lutcavage et al. 1999; Goldstein et al. 2007).

Larval presence has been confirmed in the Gulf of Mexico (Richards 1991). Most of the larvae found in the Gulf of Mexico were located around the 1,000-fathom (1,828.8 m) curve in the northern Gulf of Mexico, with some sporadic collections off Texas. Using a time series of larval bluefin tuna data from the Gulf of Mexico, Muhling et al. (2010) defined favorable habitat for bluefin larvae as moderately warm waters (i.e., they were most commonly collected in 23.5 to 28 °C) outside the Loop Current and Loop Current eddies, and outside of cooler, higher chlorophyll continental shelf waters. It appears that larvae are generally retained in the Gulf of Mexico until they grow into juveniles.

Larvae have also been documented outside of the Gulf of Mexico, and the possibility of additional spawning areas cannot be discounted (McGowan and Richards, 1989). Larvae have been found as far north as the Slope Sea (Richardson et al. 2016), although their presence was previously associated with advection from the Florida Straits and not from offshore spawning (McGowan and Richards 1989). In the Florida Straits, larvae are primarily collected along the western edge of the Florida Current, suggesting some active transport from the Gulf of Mexico. This could also explain their occasional collection off the southeast United States in some studies.

In June, young-of-year bluefin (YOY) begin movements in schools to juvenile habitats (McGowan and Richards 1989) thought to be located over the continental shelf around 34° N and 41° W long. They have also been identified from the Dry Tortugas area in June and July (Richards 1991; ICCAT 1997). Juveniles migrate to nursery areas located between Cape Hatteras, North Carolina and Cape Cod, Massachusetts (Mather et al. 1995).

Variations in distribution and migration patterns have been noted through tagging studies and fishery independent surveys. For example:

- Lawson et al. (2010) noted that in March-April of a given year that tagged bluefin occupy weakly stratified, off-shelf waters along the edge of the Gulf Stream. As shelf waters warmed into the summer, the fish shifted distribution shoreward onto the shelf. Diving behavior changed by season. The fish departed shelf waters by November.
- Golet et al. (2013) studied the distribution of commercial sized (greater than 185 cm) bluefin tuna schools in the Gulf of Maine. Using a 28-year (1979-2005) time series of commercial bluefin tuna catches and sightings from fishermen's logbooks, they noted a gradual eastward shift of commercial sized bluefin tuna school distribution towards offshore and Canadian waters. The authors associated this shift in size distribution to the changes in size and abundance of Atlantic herring.
- Galuardi and Lutcavage (2012) developed and deployed mini popup satellite archival tags (PSAT) on juvenile bluefin tuna (aged 2-5) captured in coastal recreational fisheries off Cape Cod from 2005 to 2009. Tagged fish traveled between summer habitats in the Mid-Atlantic Bight and off Southern New England (coastal areas, the Gulf Stream margin and shelf break) to winter habitats in the South Atlantic Bight and the northern Bahamas.

3.4 Essential Fish Habitat

Section 303(a)(7) of the Magnuson-Stevens Act requires FMPs and their amendments to describe and identify EFH, minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat. The Magnuson-Stevens Act defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity." (16 U.S.C. § 1802(10)). Implementing regulations for EFH provisions are at 50 C.F.R. 600, Subpart J.

Adverse effects from fishing may include physical, chemical, or biological alterations of the substrate, and loss of, or injury to, benthic organisms, prey species, and their habitat, and other components of the ecosystem. Based on an assessment of the potential adverse effects of all fishing equipment types used within an area identified as EFH, NMFS must propose measures to minimize fishing effects if there is evidence that a fishing practice is having more than minimal and lasting adverse effect on EFH.

NMFS originally described and identified EFH and related EFH regulatory elements for all HMS in the management unit in 1999, some of which were updated in 2003 via Amendment 1 to the 1999 HMS FMP (68 FR 45237; August 1, 2003). EFH boundaries published in the 1999 HMS FMP and Amendment 1 to the 1999 HMS FMP were updated in Final Amendment 10 to the 2006 Consolidated HMS FMP (NMFS 2017). Amendment 10 included a complete review and update of the 10 components of EFH, which includes updates to EFH boundaries and text descriptions and an updated review of fishing and non-fishing impacts to EFH. Information presented in this section is summarized from Amendment 10, which reflects the best scientific information available.

Amendment 10 incorporates by reference several analyses that were completed in earlier Atlantic HMS FMP amendments. An EFH impacts analysis of all Atlantic HMS gears was completed for the 2006 Consolidated HMS FMP and is shown in Table 3.5.

Table 3.5 Impact Assessment of HMS Fishing Gear on HMS and Non-HMS EFH

HMS Gear Type	Contacts Bottom	SAV	Coral Reef	Hard Bottom	Sand/ Shell	Soft Bottom	HMS EFH Water Column
Bandit gear				/+			0
Bottom longline	X	0/	+/	+/+	0/+	0/+	0
Handline		0/	+/	+/+	0/	0/	0
Harpoon							0
Gillnet, anchored	X	+/+	++/	+/+	+/+	0/+	0
Gillnet/strikenet							0
Pelagic longline		0/0	0/0	0/0	0/0	0/0	0
Purse seine, tuna		0/?	0/	0/	0/+	0/+	0
Rod and feel		0/	+/	+/+	0/	0/	0
Tuna trap/fish weir	X	++/++	-	-	0/?	0/?	0

SAV = submerged aquatic vegetation.
"-"indicates that the gear type is not used in these habitat types.
Habitat impacts are as follows: negligible = 0, low = +, medium = ++, high = +++, unknown=?. A blank indicates not evaluated.
Source: The symbols before the slash are from the Caribbean FEIS, 2004 (Table 3.15a). Symbols after the slash are taken from Barnette, 2001.

Most HMS reside in the upper part of the water column and habitat preferences are likely influenced by oceanic factors such as areas of convergence or oceanographic fronts (e.g., those found over submarine canyons, continental shelf edges, or boundary currents), temperature convergence zones (e.g., boundaries of currents or features that influence currents including landforms such as Cape Hatteras or undersea features like the Charleston Bump, or surface structure (e.g., floating *Sargassum* mats). Although there is no substrate or hard structure in the traditional sense, these water column habitats can be characterized by their physical, chemical and biological parameters. The water column can be defined by a horizontal and vertical component. Horizontally, salinity gradients strongly influence the distribution of biota. Horizontal gradients of nutrients, decreasing seaward, affect primarily the distribution of phytoplankton and, secondarily, the organisms that depend on this primary productivity. Vertically, the water column may be stratified by salinity, oxygen content, and nutrients. The water column is especially important to larval transport. While the water column is relatively difficult to define in terms of habitat characteristics, it is no less important since it is the medium of transport for nutrients and migrating organisms between estuarine, inshore, and offshore waters.

NMFS completed reviews of fishing gear impacts in the 1999 HMS FMP, Amendment 1 to the 1988 Billfish FMP, the 2006 Consolidated HMS FMP, and Amendments 1 and 10 to the 2006 Consolidated HMS FMP. These analyses determined that the majority of HMS gears are fished within the water column and do not make contact with the sea floor. Because of the magnitude of water column structures and the processes that create them, there is little effect expected from the HMS fishing activities with pelagic longline gear undertaken to pursue these animals. Excessive dead discards could induce minor, localized increases in biological oxygen demand. However, deployment of pelagic longline gear is not anticipated to permanently affect the physical characteristics that define

HMS EFH such as salinity, temperature, dissolved oxygen, and depth. Because pelagic longline gear is fished in the water column and does not come in contact with the benthic environment, the pelagic longline fishery is anticipated to have minimal to no impact on EFH (for Atlantic HMS or for other species managed under Council FMPs) associated with the benthic environment.

For more information, please refer to the following websites:

- Final Amendment 10 website.
- EFH Boundaries may be viewed on the NMFS Habitat Mapper.
- Shape files, metadata, a species list, and a preview map may be viewed on the EFH Data Inventory website.

3.4.1 Bluefin Tuna EFH

The EFH text descriptions for bluefin tuna are provided in this section, along with corresponding maps for the Spawning/Eggs/Larvae (Figure 3.5), Juvenile (Figure 3.6), and Adult (Figure 3.7) life stages. This section also describes boundaries for a Habitat Area of Particular Concern (Figure 3.8).

Spawning, eggs, and larvae:	This life stage has been expanded into two areas of the Slope Sea (between North Carolina and Georges Bank, north of the Gulf Stream) due to the presence of extremely young larvae. One area encompasses pelagic habitats on and off the continental shelf, off the coast of North Carolina, and extends to the shoreline between the NC/VA line and Oregon Inlet. The other area includes pelagic waters of the Slope Sea, extending to the outer United States' EEZ south of Georges Bank. From the mid-east coast of Florida in the Atlantic Ocean to the western Gulf of Mexico (seaward of the 100m depth contour in the Gulf of Mexico). EFH for larvae is defined by habitat associations with temperatures ranging from 23.5 to 28 °C.
Juveniles (< 185 cm fork length (FL):	Coastal and pelagic habitats of the Mid-Atlantic Bight and the Gulf of Maine, between southern Maine and Cape Lookout, from shore (excluding Long Island Sound, Delaware Bay, Chesapeake Bay, and Pamlico Sound) to the continental shelf break. EFH in coastal areas of Cape Cod are located between the Great South Passage and shore. EFH follows the continental shelf from the outer extent of the U.S. EEZ on Georges Bank to Cape Lookout. EFH is associated with certain environmental conditions in the Gulf of Maine (16 to 19 °C; 0 to 40 m deep). EFH in other locations, associated with temperatures ranging from 4 to 26°C, is often in depths of less than 20 m (but can be found in waters that are 40-100 m in depth in winter).

Adults (≥ 185 cm FL):	EFH is located in offshore and coastal regions of the Gulf of Maine; the mid-coast of Maine to Massachusetts; on Georges Bank; offshore pelagic habitats of southern New England; from southern New England to coastal areas between the mouth of Chesapeake Bay and Onslow Bay, North Carolina; from coastal North Carolina south to the outer extent of the U.S. EEZ, inclusive of pelagic habitats of the Blake Plateau, Charleston Bump, and Blake Ridge. EFH also consists of pelagic waters of the central Gulf of Mexico from the continental shelf break to the seaward extent of the U.S. EEZ between Apalachicola, Florida and Texas.
Habitat Area of Particular Concern (HAPC):	Pelagic waters of the Gulf of Mexico seaward of the 100m bathymetric line, extending to the seaward extent of the United States' EEZ and eastward to the 82º W longitude meridian.

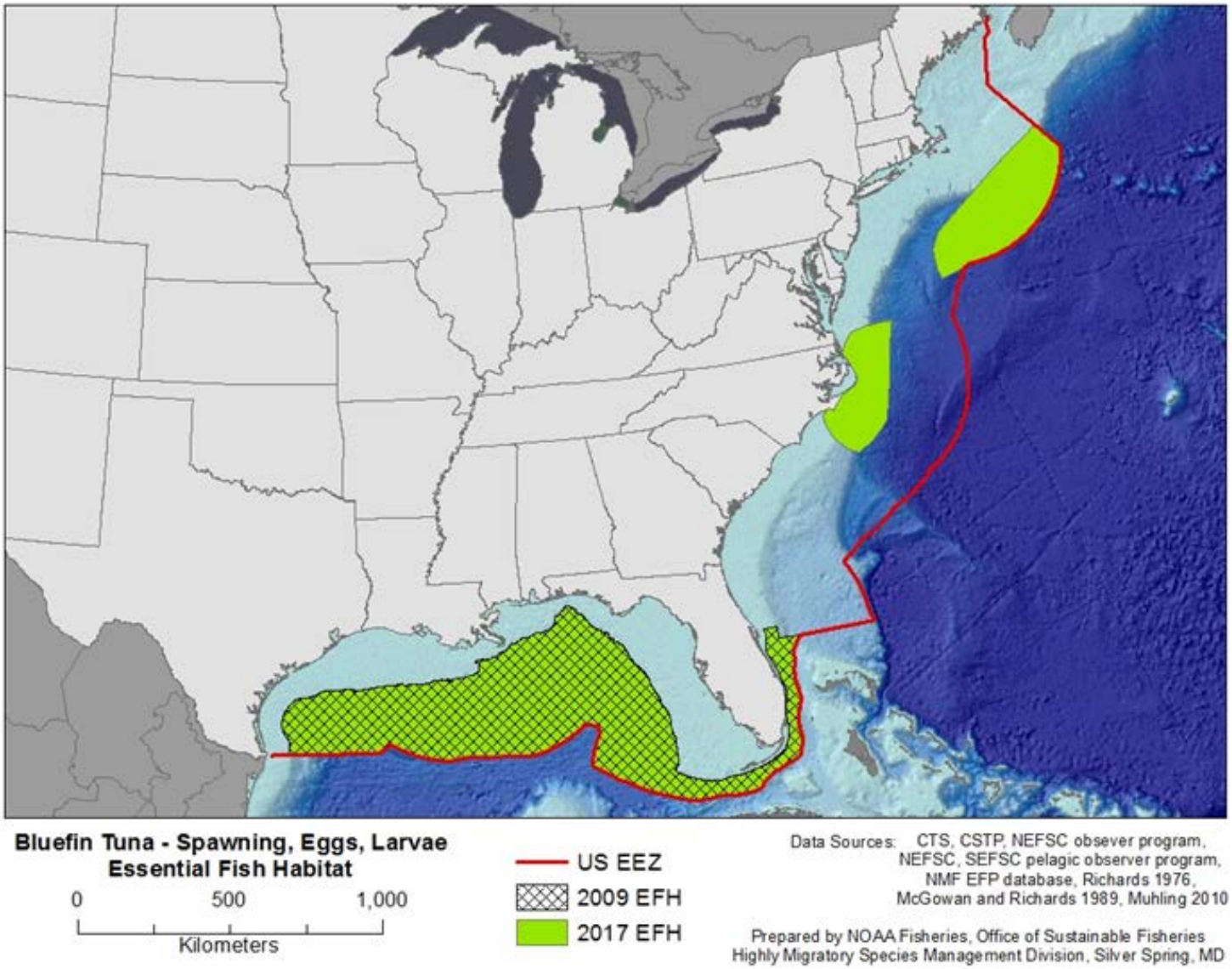

Figure 3.5 Essential Fish Habitat for Spawning, Eggs, and Larvae of Bluefin Tuna
Source: NMFS 2017.

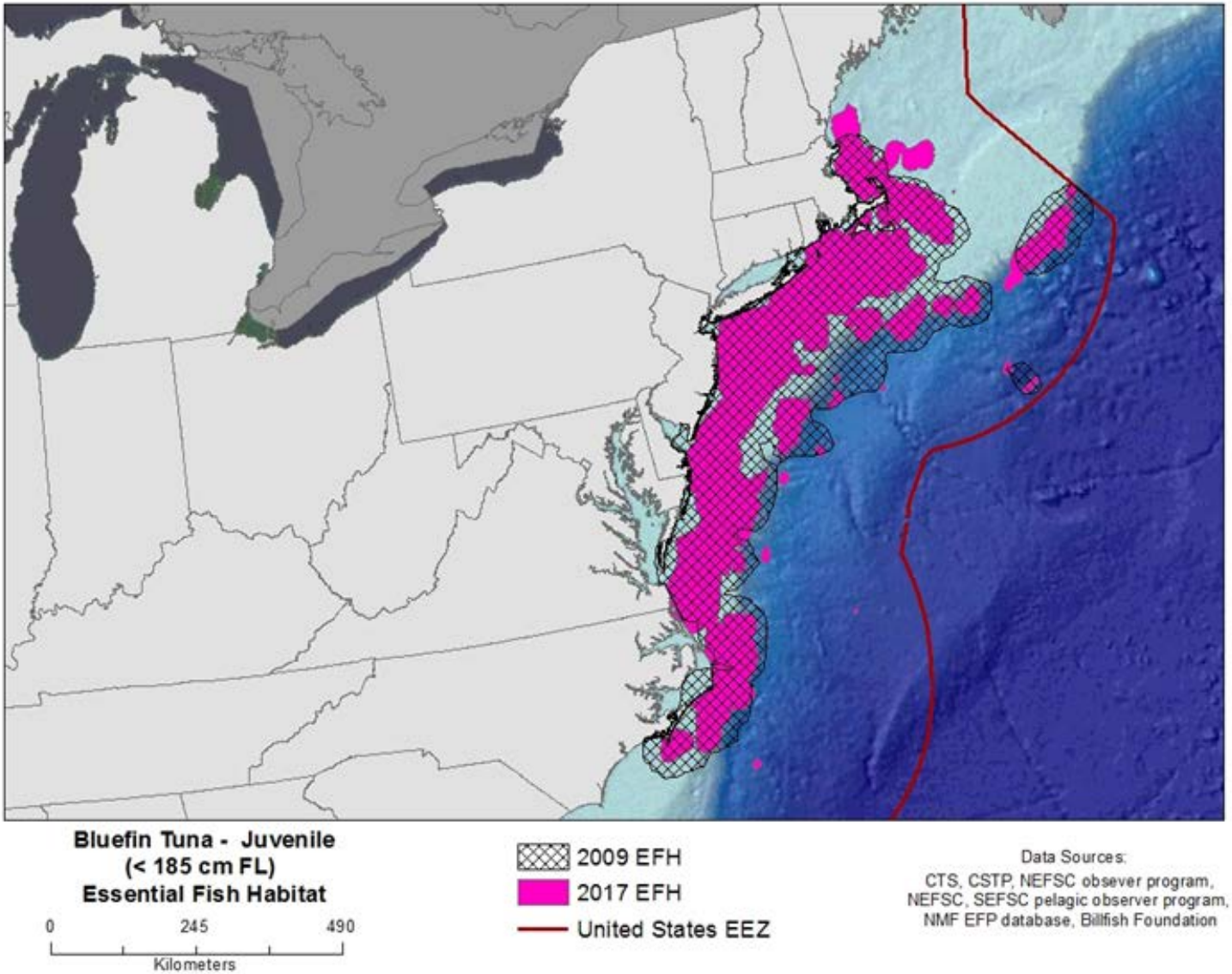

Figure 3.6 Essential Fish Habitat for Juvenile Bluefin Tuna
Source: NMFS 2017

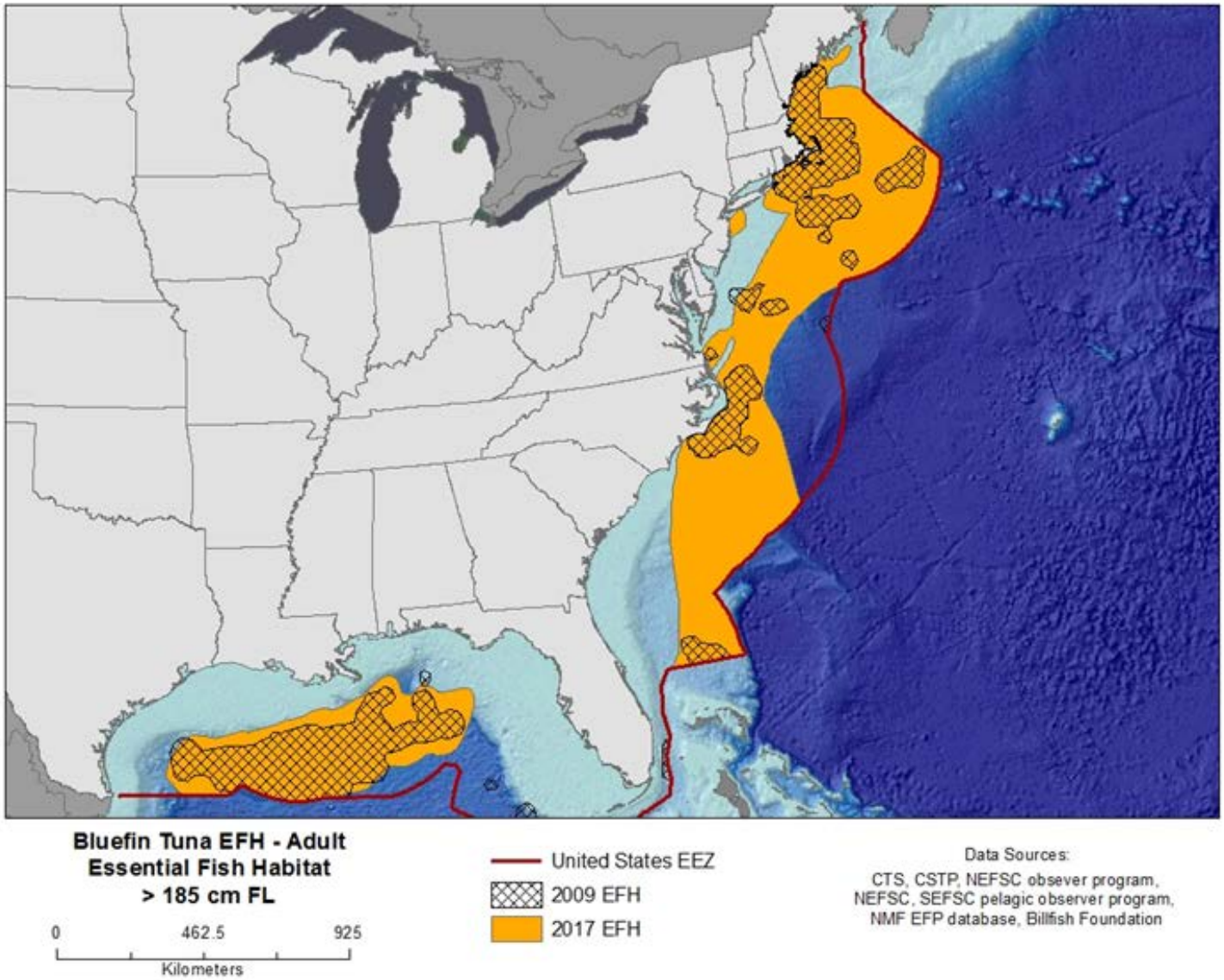

Figure 3.7 Essential Fish Habitat for Adult Bluefin Tuna
Source: NMFS 2017

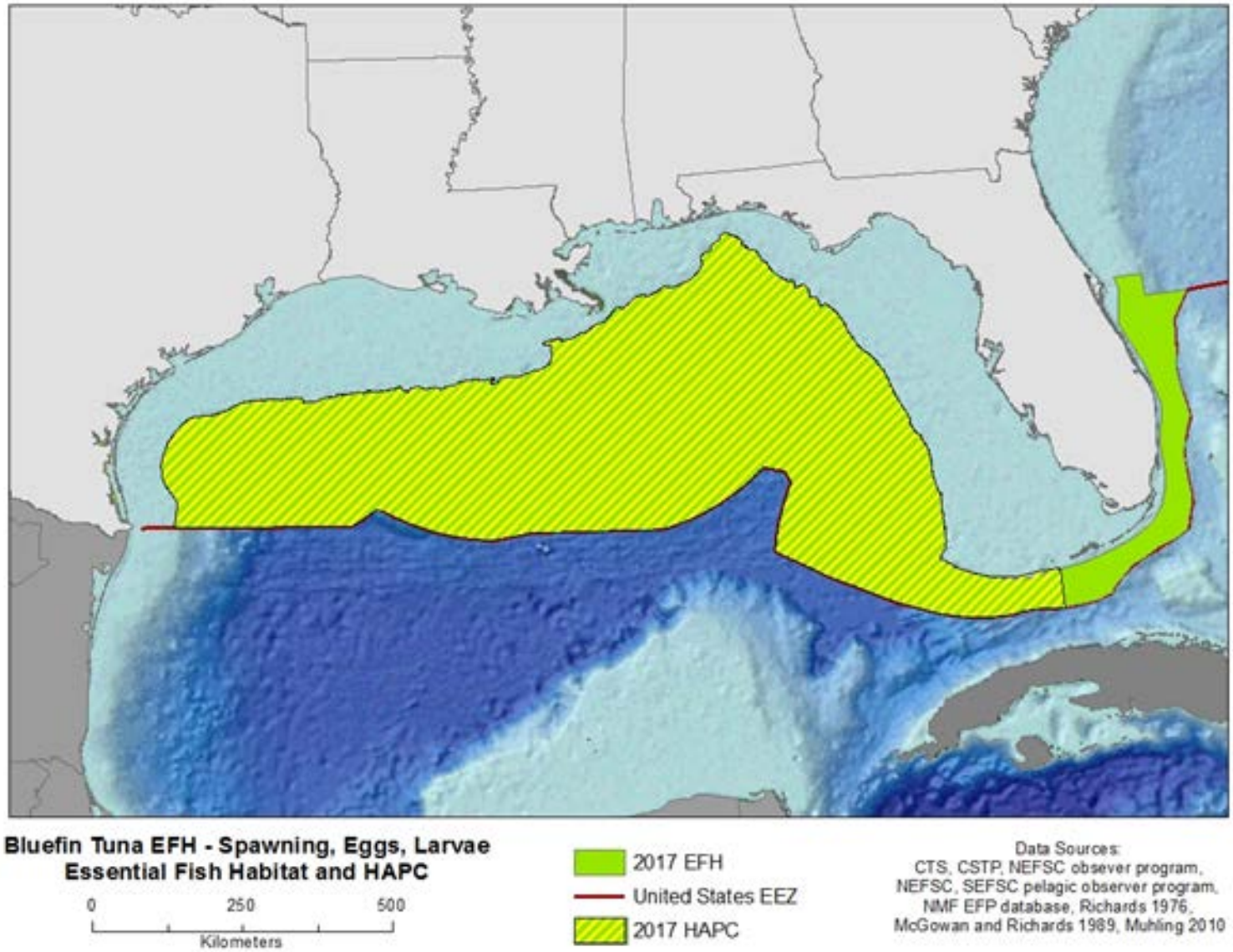

Figure 3.8 Bluefin Tuna Habitat Area of Particular Concern—Spawning, Eggs, Larval Life Stage
Source: NMFS 2017

3.5 Pelagic Longline Fisheries Data

This section describes the pelagic longline fishery data (effort, fishery trends, data from closed areas and gear restricted areas, and economic and societal environment), and provides a view of the current condition of the fishery, which serves as a baseline against which to compare potential impacts of the different alternatives.

3.5.1 Effort Data

The data described in this section has been updated from the data presented in the DEIS via the inclusion of an additional year of HMS logbook data (2018) that became available after the publication of the DEIS.

Table 3.6 shows the average number of hooks fished by the pelagic longline fishery from 2006 through 2011 (n ≈ 6,195,209), 2012 through 2014 (n ≈ 7,369,858), and 2015 through 2018 (n ≈ 4,676,545). The average number of hooks fished by the pelagic longline fishery over time shows a declining trend (Figure 3.9) along with the declining number of vessels deploying pelagic longline gear (Table 3.9). The 2006 through 2011 period encompasses the period after implementation of the 2006 Consolidated HMS FMP, while the 2012 through 2014 period encompasses the average number of hooks prior to the implementation of Amendment 7. The data from 2015-2018 represents post-Amendment 7 activity. Between 2015 and 2017, total effort fluctuated annually by less than 10 percent. However, in the last two years (2017 to 2018), total fleet-wide effort decreased by nearly 57 percent. The areas with the greatest fishing effort include the Gulf of Mexico, Mid-Atlantic Bight, South Atlantic Bight, Florida East Coast, and the Northeast Coastal areas (Figure 3.10).

Table 3.6 Total Number of Hooks Fished by the Pelagic Longline Fishery

Time Period	Average Annual # Hooks Fished
2006–2011 (average annual #hooks fished)	6,195,209
2012–2014 (average annual #hooks fished)	7,369,858
2015–2018 (average annual #hooks fished)	4,676,545
Year	**Total Hooks Fished**
2015	5,855,977
2016	5,217,547
2017	5,327,587
2018	4,030,875

Source: HMS logbook data.

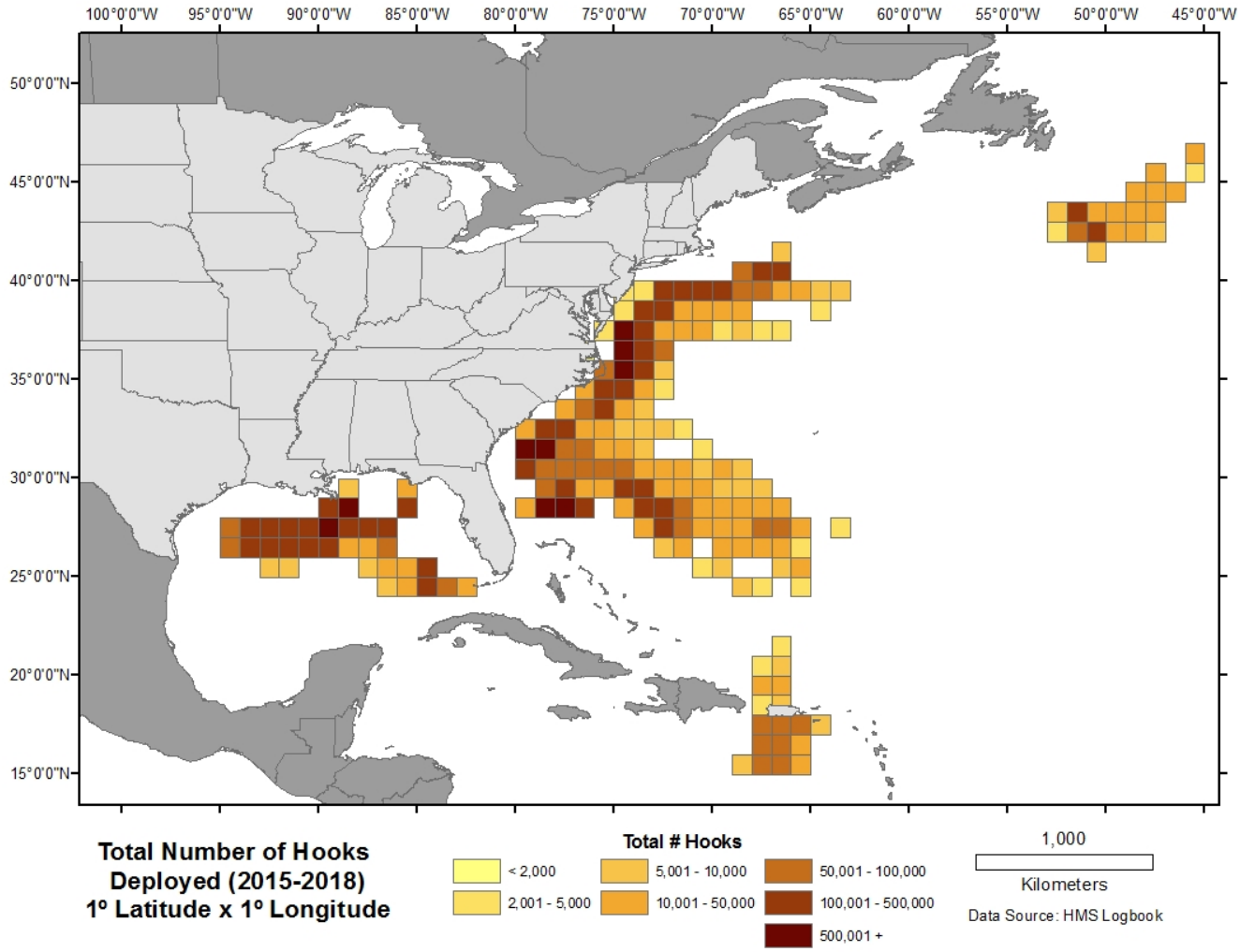

Figure 3.9 Reported Hooks Fished by the HMS Pelagic Longline Fleet (2015–2018)
Source: HMS logbook data.

3.5.2 Recent Fishery Trends and the IBQ Program

The following sections present data that describe the spatial distribution of the fleet, and CPUE and fleet-wide catch data for pelagic longline target species (e.g., swordfish, yellowfin/bigeye tuna and dolphin) and bluefin tuna. Data on bluefin interactions that are specific to the areas considered in this rulemaking (i.e., Northeastern U.S. Closure and an adjacent open reference area included in the analysis, the Cape Hatteras Gear Restricted area, and the Gulf of Mexico Gear Restricted Areas) are presented, as is the IBQ Program.

3.5.2.1 Fishery-Wide Catch Data

Most of the maps and data in this section have been updated from the DEIS to the FEIS to include an additional year of data (2018), per the availability of new data from the HMS Logbook database, Final Three-Year Review of the IBQ Program, and the most recent report by the United States to ICCAT.

Spatial distribution of pelagic longline target species catch-per-unit effort (catch per 10,000 hooks) is shown in Figure 3.10 to Figure 3.15 and Table 3.7; these maps show catch-per-unit effort averaged over 1º latitude x 1º longitude grid cells (note differences in the scale of each map). Data are displayed using quantile classification, a classification method that distributes a set of values into groups that contain an equal number of values (i.e., the attribute values are added up; then divided into the predetermined number of classes). The pelagic longline fishery experienced moderately high catch-per-unit efforts for swordfish across much of the fishing grounds in the Atlantic, with catch-per-unit effort hotspots occurring in the Grand Banks, Georges Bank, Florida (Blake Plateau and Florida Keys), South Carolina (Charleston Bump region), in the high seas east of the Bahamian EEZ, and in the U.S. Caribbean. Dolphin catch-per-unit effort hotspots occurred mainly within coastal regions of the South Atlantic Bight with some in the Caribbean. Two regional hotspots for yellowfin tuna are apparent in the Gulf of Mexico, and between North Carolina and Georges Bank. In comparison to these three species, catch-per-unit effort is much lower and more dispersed for bigeye and bluefin tuna. A moderate catch-per-unit effort hotspot is apparent just outside of the Florida East Coast Closure, and moderately high catch-per-unit efforts for bluefin tuna are apparent off southern Georges Bank.

One table in this section, Table 3.7, is derived from analyses generated for the 2018 HMS SAFE Report, and includes fishery landings and discard data spanning from 2012 through 2017. In general, target species landings have decreased between 2012 and 2017. For example, the number of swordfish, BAYS (bigeye, albacore, yellowfin, and skipjack) tunas, and dolphin kept has decreased by nearly 55 percent, 19 percent, and 31 percent, respectively (Table 3.7). The United States utilized nearly 87 percent of the ICCAT baseline swordfish allocation as recently as 2012, though only utilized just over 34 percent in 2018 (a decrease of 60 percent in 6 years) (Table 3.8). In contrast, bluefin tuna landings have generally increased from 2012 through 2017, especially in recent years as the fishery transitioned from the bluefin target catch program (whereby 1-3 bluefin were allowed to be landed based on the amount of target catch landed) to the IBQ Program (Table 3.7). Reported dead discards of bluefin have fluctuated from 2012 to 2017 (Table 3.7), with the largest change occurring between 2012 and 2017 (from 193 to 28, an 85% decrease) (NMFS 2018). The percent of active vessels landing bluefin has generally declined since 2012; however, the percent of active vessels reporting dead discards has fluctuated between 15 and 35 percent (Table 3.9).

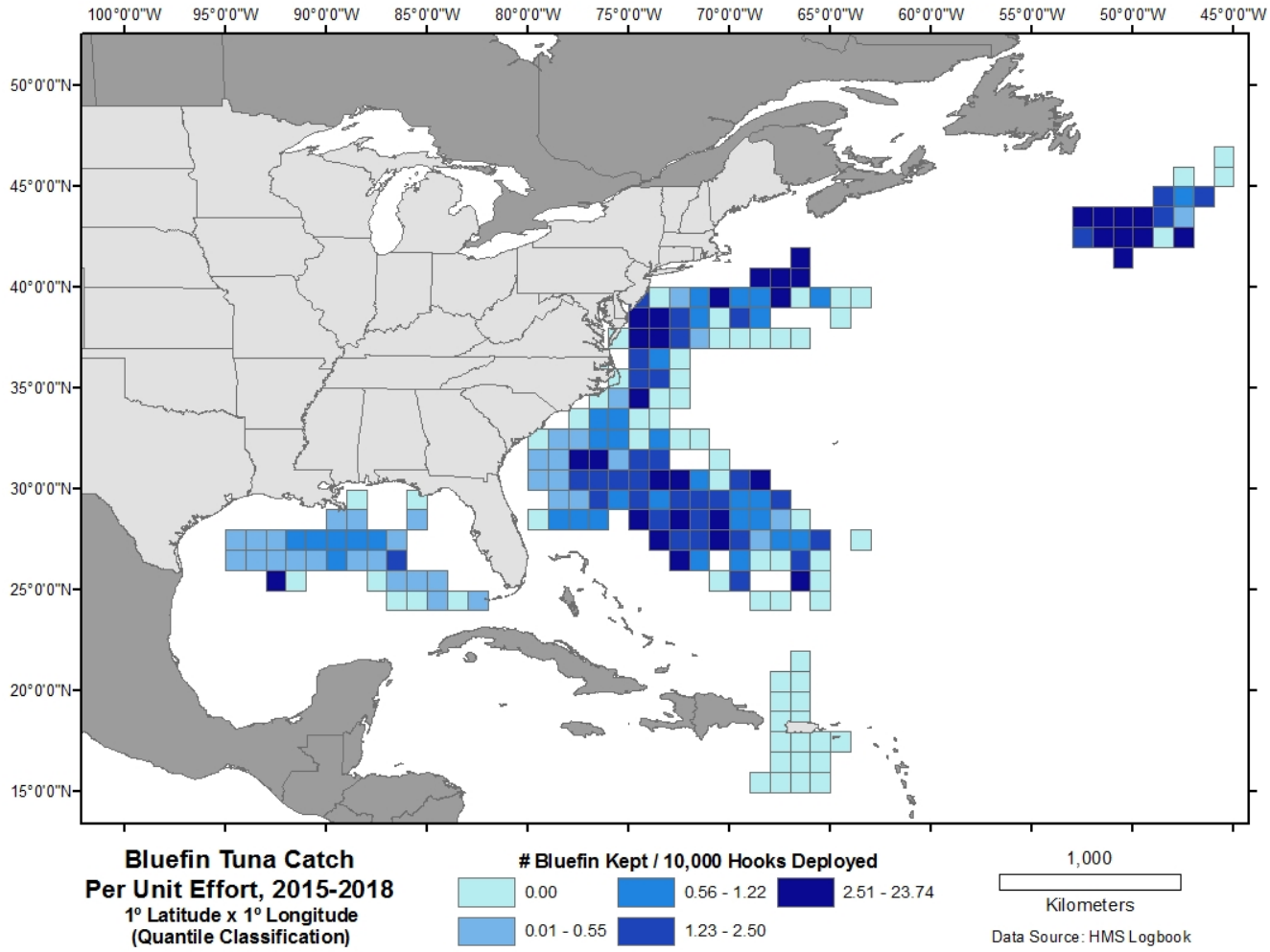

Figure 3.10 CPUE of Bluefin Tuna (2015–2018)
Catch-per-unit effort per cell = (sum of all bluefin tuna kept in a cell/sum of all hooks deployed in a cell) × 10,000.
Source: HMS Logbook Data.

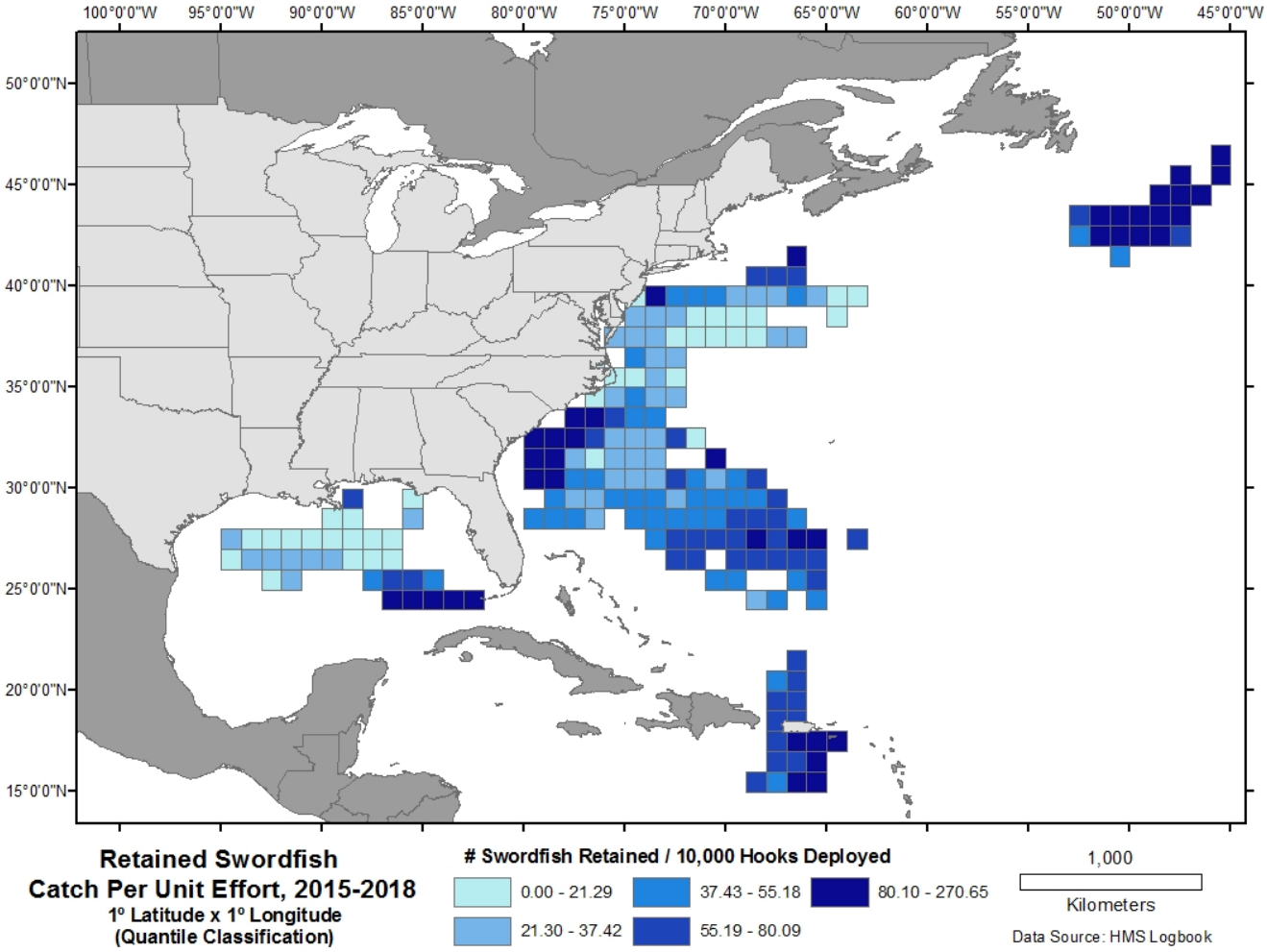

Figure 3.11 CPUE of Swordfish (2015–2018)

Catch-per-unit effort per cell = (sum of all swordfish kept in a cell/sum of all hooks deployed in a cell) × 10,000.

Source: HMS logbook data.

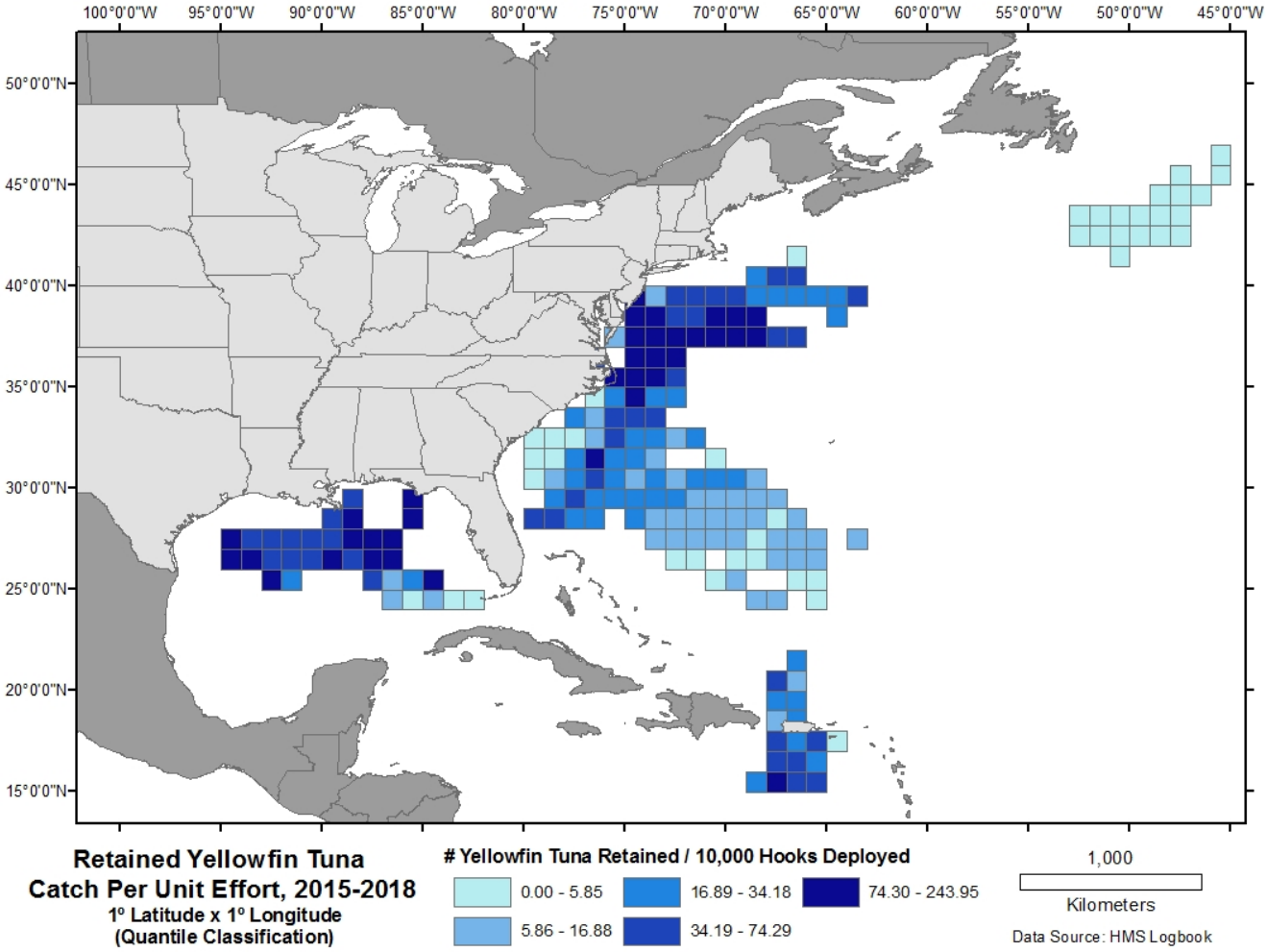

Figure 3.12 CPUE of Yellowfin Tuna (2015–2018)

Catch-per-unit effort per cell = (sum of all yellowfin kept in a cell/sum of all hooks deployed in a cell) × 10,000.

Source: HMS logbook data.

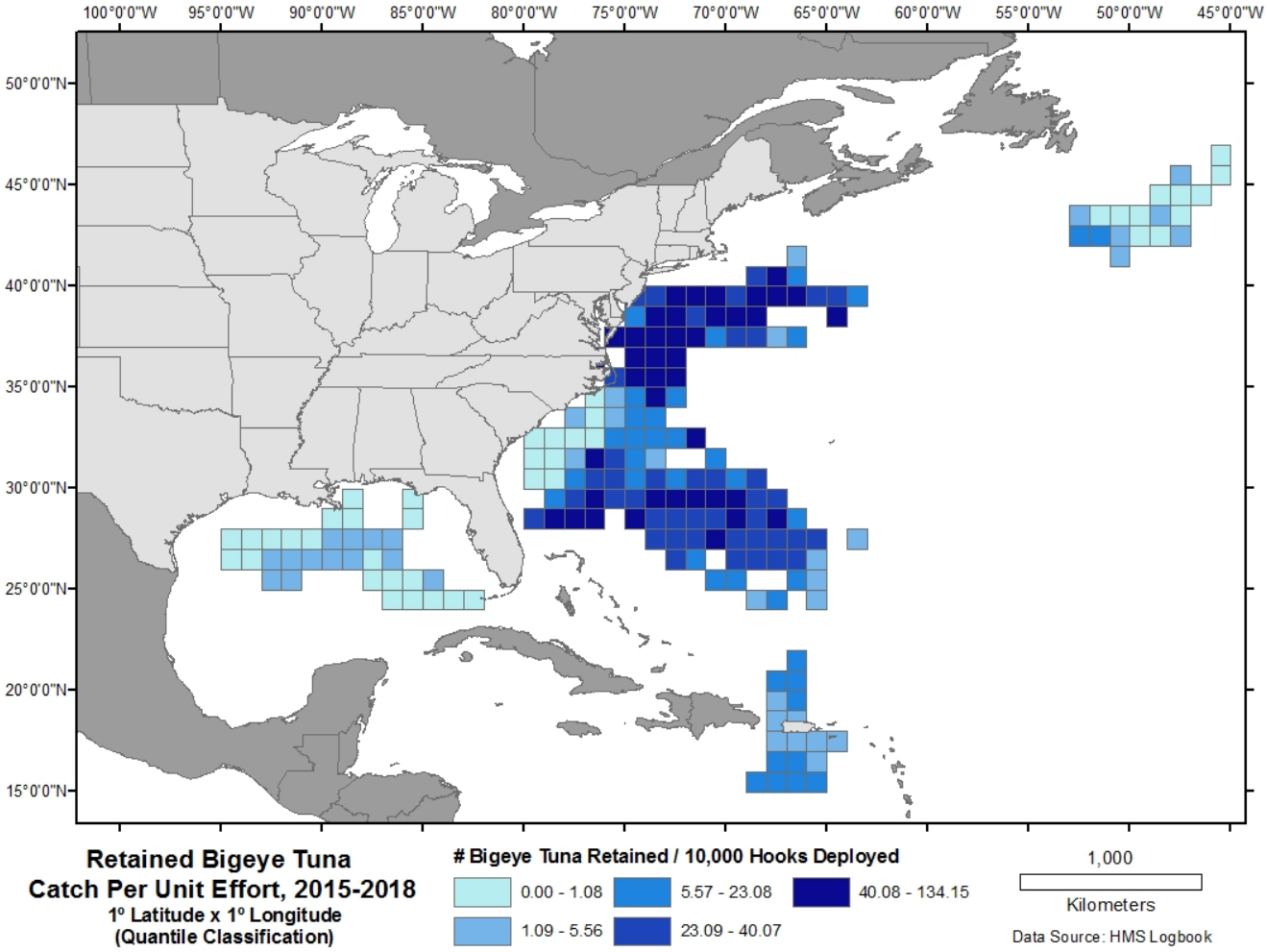

Figure 3.13 CPUE of Bigeye Tuna (2015–2018)

Catch-per-unit effort per cell = (sum of all bigeye tuna kept in a cell/sum of all hooks deployed in a cell) × 10,000.

Source: HMS logbook data.

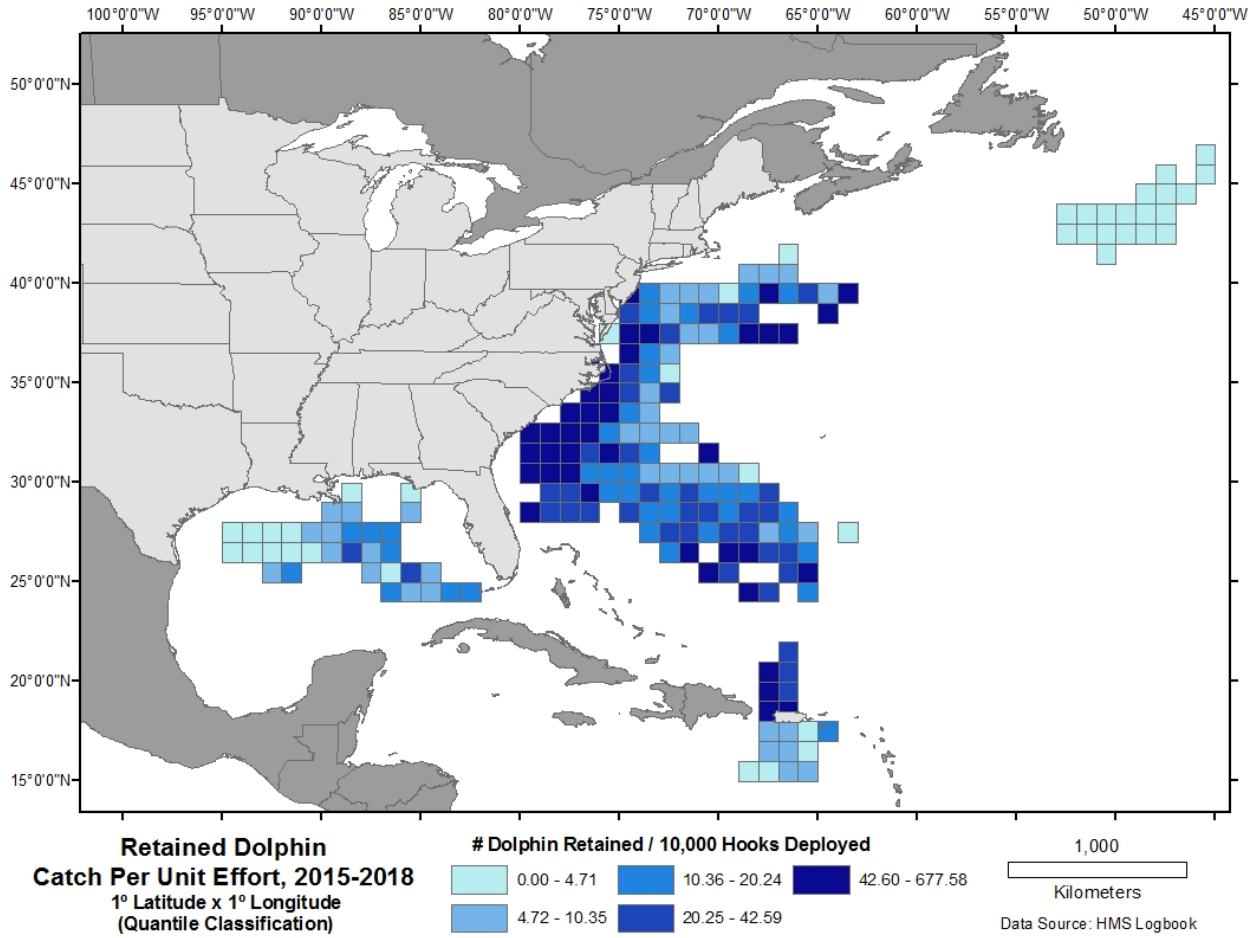

Figure 3.14 CPUE of Dolphinfish (*Coryphaena hippurus*) (2015–2018)
Catch-per-unit effort per cell = (sum of all dolphin kept in a cell/sum of all hooks deployed in a cell) × 10,000.
Source: HMS logbook data.

Table 3.7 Reported Numbers of Catch in the U.S. Atlantic Pelagic Longline Fishery (2012–2017)

Species	2012	2013	2014	2015	2016	2017
Swordfish kept	51,544	44,556	32,908	27,730	24,456	23,332
Swordfish discarded	7,996	4,756	4,655	5,382	4,437	7,116
Blue marlin discarded	896	844	718	990	1,050	1,562
White marlin discarded	1,432	1,239	1,580	2,885	2,153	2,221
Sailfish discarded	795	456	445	715	855	657
Spearfish discarded	270	342	306	837	745	686
Bluefin tuna kept*	407	299	392	323	437	501
Bluefin tuna discarded dead*	193	84	115	48	162	28
Bluefin tuna discarded alive*	353	168	232	158	418	201
Bigeye, albacore, yellowfin, and skipjack tunas kept ("BAYS" tunas)	84,707	67,083	73,339	54,734	56,978	68,329
Dolphin kept	42,445	34,250	63,217	53,526	46,376	29,141

Source: 2017 and 2018 HMS SAFE Reports. *Numbers were generated from the final Three-Year Review of the IBQ Program (Table 3.3; Table 6.26; and Table 6.27).

Table 3.8 ICCAT swordfish total allowable catch and United States quota allocation and catch (2012 - 2018)

Year	ICCAT Total Allowable Catch (mt)	U.S. Allocation (mt)	U.S. Catch (Landings & Discards) (mt)	U.S. Swordfish Catch Relative to ICCAT Swordfish Allocation (%)
2012	10,300.8	2,937.59	2,551.13	86.8
2013	10,300.8	2,937.59	2,123.31	72.3
2014	10,300.8	2,937.59	1,462.41	49.8
2015	10,300.8	2,937.59	1,291.73	44.0
2016	10,300.8	2,937.59	1,126.32	38.3
2017	10,300.8	2,937.59	1,036.09	35.3
2018	9,924.81	2,937.59	1,011.9	34.4

Source: NMFS 2019. Annual Report of the United States to ICCAT (2018). U.S. Department of Commerce, NOAA Fisheries. ANN-041/2019.

Table 3.9 Bluefin Interactions Across the Pelagic Longline Fleet (2012–2018)

Year	Vessels Deploying Pelagic Longline Gear	Vessels Reporting Bluefin Interactions	Percent with Interactions (%)	Percent without Interactions (%)
2012	122	94	77	39
2013	115	81	70	34
2014	110	87	79	30
2015	104	59	57	16
2016	85	56	64	29
2017	88	58	66	15
2018	76	50	66	16

HMS logbook data; Final IBQ 3 Year Review (NMFS 2019).

3.5.2.2 Pelagic Longline Closures and Gear Restricted Areas

Spatial distribution of bluefin and pelagic longline target species catch-per-unit effort (catch per 10,000 hooks) are shown in Figure 3.10 to Figure 3.15; these maps show catch-per-unit effort averaged over 1º latitude x 1º longitude grid cells. As mentioned above, most of these maps have been updated from the DEIS to the FEIS through the inclusion of an additional year of data (2018). Bluefin tuna catch-per-unit effort was lower than the other species, with CPUE hotspots occurring in the NED, off Georges Bank, in the Mid-Atlantic Bight, and in the high seas east of the Bahamian EEZ. The pelagic longline fishery experienced moderately high catch-per-unit efforts for swordfish across much of the fishing grounds in the Atlantic, with catch-per-unit effort hotspots occurring off Georges Bank, the South Atlantic Bight, the high seas (east of the Bahamian EEZ), and in the U.S. Caribbean (Figure 3.11). Dolphin catch-per-unit effort hotspots occurred mainly within coastal regions of the South Atlantic Bight, but some areas in the high seas east of the Bahamas and in portions of the U.S. Caribbean adjacent to northwestern Puerto Rico also had high catch per unit effort (Figure 3.14). Regional hotspots for yellowfin tuna are apparent in the Gulf of Mexico the U.S. Caribbean, and in the Mid-Atlantic Bight between North Carolina and Georges Bank (Figure 3.12). Bigeye tuna catch-per-unit effort was relatively high between Cape Hatteras and Georges Bank, on the Blake Plateau east of Florida, and in the high seas east of the Bahamian EEZ (Figure 3.13).

Northeastern United States Closed Area

As mentioned in Section 3.2.2.1, the Northeastern United States Closed Area was implemented on July 1, 1999, to reduce dead discards of bluefin by pelagic longline gear, while also minimizing the negative impact to targeted fishing activities. This area is closed to pelagic longline vessels during the month of June.

Table 3.10 and Table 3.11 show the bluefin interactions in the Northeastern United States Closed Area from 1996-1997 and from an area surrounding the closure (labelled the "Reference Area" in later analyses) in 2015-2018, respectively. Data for the reference area has been updated from the DEIS to the FEIS through the inclusion of an additional year of data (2018). The number of bluefin discarded dead during the month of June decreased by 82 percent from 440 to 78. The grand total of bluefin catch for 1996-1997 and 2015-2018, decreased from 694 to 388 (~ 56 percent reduction), respectively. Between 2015 and 2018, the catch-per-unit effort of bluefin in June in the mid-Atlantic and southern New England region was highest in continental shelf habitats in the Cape Hatteras region, the Mid-Atlantic Bight, and east of the current boundaries of the Northeastern United States Closed Area (Figure 3.15). This map has been updated from the DEIS to the FEIS with the inclusion of an additional year of data (2018). However, it should be noted that some of the areas to the east of the Northeast Closure are now closed to the fishery as a result of the Northeast Canyons and Seamounts National Monument. Therefore, the catch-per-unit effort in future years may vary as a result of distribution of open fishing grounds for the same areas analyzed.

Table 3.10 Northeastern U.S. Closed Area Bluefin Landings from 1996–1997

Time Period	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Bluefin Catch
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	3	85	67	70
June	38	824	440	478
July	18	166	72	90
August	2	8	2	4
September	0	0	1	1
October	0	2	0	0
November	7	6	7	14
December	13	40	24	37
Grand total	81	1131	613	694

Source: HMS logbook data.

Table 3.11 Northeastern U.S. Reference Area*—Bluefin Landings from 2015–2018

Time Period	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Bluefin Catch
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	3	16	15	18
June	193	244	78	271
July	65	71	11	76
August	9	23	3	12
September	2	0	0	2
October	0	3	0	0
November	6	9	2	8
December	1	0	0	1
Grand total	279	366	109	388
2015 totals	38	74	10	48
2016 totals	155	213	91	246
2017 totals	46	49	2	48
2018 totals	40	31	6	77

*See boundaries as depicted by blue shaded box in Figure 4.2 of this FEIS.

Source: HMS logbook data.

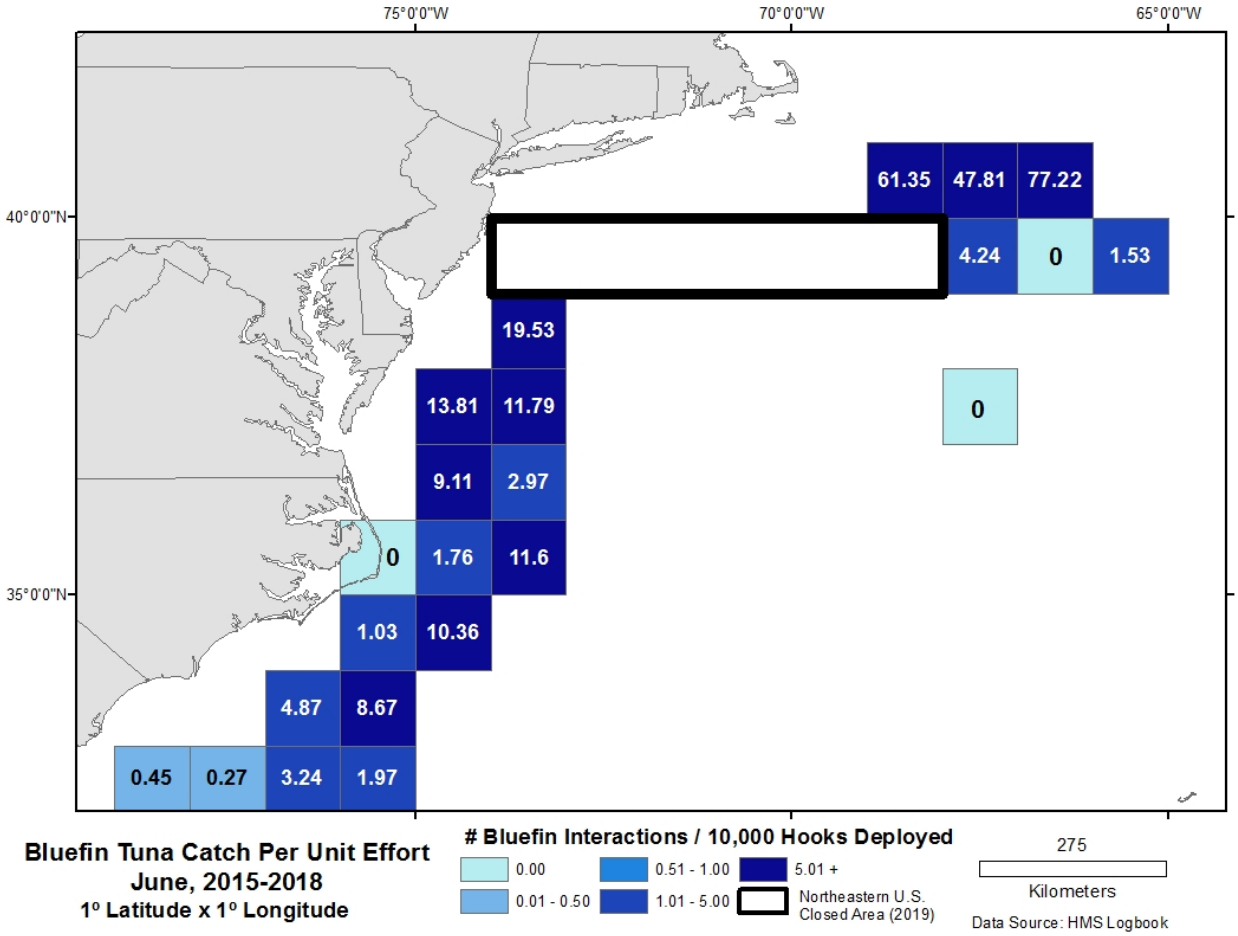

Figure 3.15 CPUE-Bluefin Interactions
Source: HMS logbook data.

Cape Hatteras Gear Restricted Area

As mentioned in section 3.2.2.2, the Cape Hatteras Gear Restricted Area was implemented on January 1, 2015, in order to reduce interactions of bluefin by pelagic longline gear, while minimizing the negative impact to targeted fishing activities.

The tables and map in this section have been updated from the DEIS to the FEIS with the inclusion of an additional year of data (2018). Table 3.12 and Table 3.13 show the bluefin landings in the Cape Hatteras Gear Restricted Area from 2015-2018 and bluefin tuna interactions by disposition from 2006-2011, 2012-2014, and 2015-2018, respectively. The average annual number of bluefin discarded dead for 2006-2011, 2012-2014, and 2015-2018, decreased from 110, to 13, to 8, respectively. Catch-per-unit effort in and around the Cape Hatteras Gear Restricted Area for the months of December-April (2015-2018) was very low compared to areas further northeast (Figure 3.17).

Table 3.12 Cape Hatteras Gear Restricted Area Sum of Bluefin Tuna Landings from 2015–2018

	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Bluefin Interactions
January	22	34	10	66
February	24	26	2	52
March	18	8	0	26
April	46	23	9	78
May	47	1	0	48
June	52	25	15	92
July	1	1	0	2
August	0	0	0	0
September	0	0	0	0
October	0	1	0	1
November	8	2	0	10
December	11	2	3	16
Grand total	229	123	39	391

Source: HMS logbook data.

Table 3.13 Cape Hatteras Gear Restricted Area Bluefin Tuna Interactions by Disposition and Time (December - April)

Bluefin Interactions	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Bluefin Interactions
2006–2011 average annual # bluefin*	28	330	110	468
2012–2014 average annual # bluefin	31	50	13	94
2015–2018 average annual # bluefin (see Table 4.13)	32	25	8	65
2015 totals	4	0	1	5
2016 totals	10	6	0	16
2017 totals	43	23	5	71
2018 totals	64	64	18	146

*See Table 3.24 (page 157) of NMFS 2014.

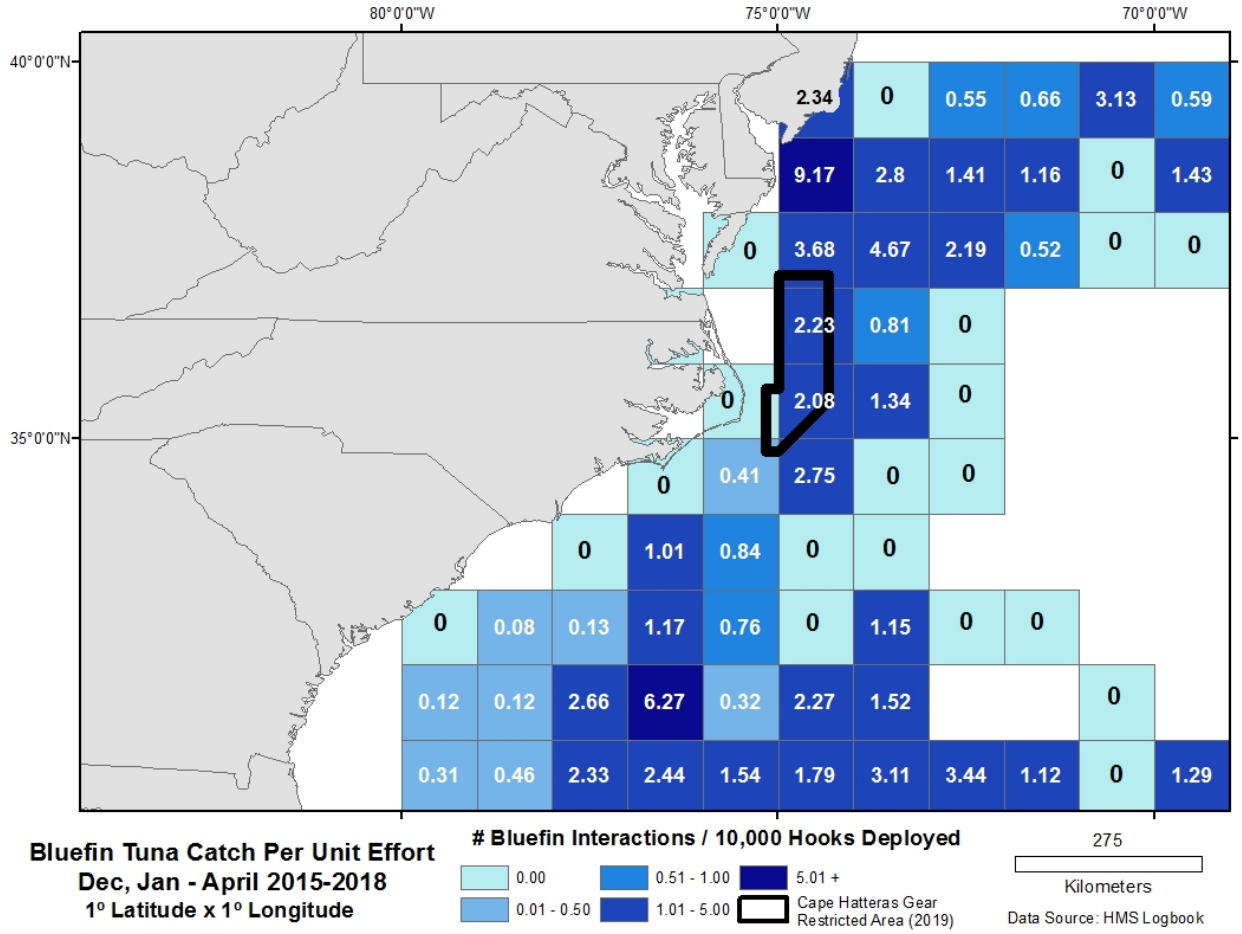

Figure 3.16 CPUE-All Bluefin Interactions
Source: HMS logbook data.

Spring Gulf of Mexico Gear Restricted Area

As discussed in section 3.2.2.3, the Spring Gulf of Mexico Gear Restricted Area was implemented on January 1, 2015, to reduce incidental interactions of bluefin tuna by pelagic longline gear, while minimizing the negative impact to targeted fishing activities. These areas are closed to pelagic longline vessels during the month of April through May.

Table 3.14 to Table 3.19 show the bluefin tuna interactions in the Gulf of Mexico pelagic longline gear restricted areas by disposition from 2006-2012, 2012-2014 and 2015-2018 (Table 3.14-Table 3.19) , and region-wide in the Gulf of Mexico from 2006-2012, 2012-2014 and 2015-2018 (Table 3.20-Table 3.22), respectively. The number of bluefin tuna discarded dead during the month of April and May from sets made within the Spring Gulf of Mexico Gear Restricted Area decreased from 323 to 0 (a 100 percent reduction) (Table 3.14 and Table 3.19). Total bluefin tuna interactions for 2006-2012 and 2015-2018 in the gear restricted area decreased from 1,105 to 90 (~ a 92 percent reduction), respectively. Average annual numbers of bluefin tuna interactions from sets made within the boundaries of the Spring Gulf of Mexico Gear Restricted Area (year-round) decreased across historical (n = 158; 2006-2012), pre-implementation (n = 120; 2012-2014) and recent (n = 23; 2015-2018) time periods (~ a 72 percent reduction). Average annual Gulf of Mexico region bluefin tuna interactions decreased across historical (n = 246; 2006-2012), pre-

implementation (n = 195; 2012-2014) and recent (n = 69; 2015-2018) time periods (~ an 85 percent reduction). Catch-per-unit effort in April and May (2015-2018) was relatively low in most areas surrounding the Gulf of Mexico Gear Restricted Areas (i.e., 1-2 fish per 10,000 hooks) (Figure 3.18).

Table 3.14 Bluefin Interactions Reported in the HMS Logbook by Month in the Spring Gulf of Mexico Gear Restricted Area (2006–2012)

Month	Bluefin Kept (A)	Bluefin Discarded Alive (B)	Bluefin Discarded Dead (C)	Total Sum of Bluefin (D) = (A+B+C)	Average Annual Bluefin (E) = D / 7 years
January	38	4	3	45	6
February	62	13	15	90	13
March	64	48	46	158	23
April	76	147	151	374	53
May	79	87	172	338	48
June	14	21	30	65	9
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	1	1	0
October	13	1	2	16	2
November	6	0	0	6	1
December	12	0	0	12	2
Total	364	321	420	1,105	158

Source: HMS logbook data.

Table 3.15 Bluefin Interactions Reported in the HMS Logbook by Month in the Spring Gulf of Mexico Gear Restricted Area (2012–2014)

Month	Bluefin Kept (A)	Bluefin Discarded Alive (B)	Bluefin Discarded Dead (C)	Total Sum of Bluefin (D) = (A+B+C)	Average Annual Bluefin (E) = D / 3 years
January	25	4	3	32	11
February	18	6	5	29	10
March	30	14	10	54	18
April	32	52	37	121	40
May	29	28	25	82	27
June	2	7	8	17	6
July	0	0	0	0	0
August	0	0	0	0	0
September	0	0	0	0	0
October	13	5	3	21	7
November	0	0	0	0	0
December	2	2	0	4	1
Total	151	118	91	360	120

Table 3.16 Bluefin Interactions Reported in the HMS logbook by Month in the Spring Gulf of Mexico Gear Restricted Area (2015–2018)

Month	Bluefin Kept (A)	Bluefin Discarded Alive (B)	Bluefin Discarded Dead (C)	Total Sum of Bluefin (D) = (A+B+C)	Average Annual Bluefin (E) = D / 4 years
January	7	3	1	11	3
February	5	3	4	12	3
March	13	14	12	39	10
April	0	0	0	0	0
May	0	0	0	0	0
June	0	10	6	16	4
July	1	2	0	3	1
August	0	3	1	4	1
September	0	0	0	0	0
October	0	2	1	3	1
November	0	0	1	1	0
December	1	0	0	1	0
Grand total	27	37	26	90	23

Source: HMS logbook data.

Table 3.17 Gulf of Mexico (Region-Wide) Bluefin Interactions Reported in the HMS Logbook from 2006 - 2012

Month	Bluefin Kept (A)	Bluefin Discarded Alive (B)	Bluefin Discarded Dead (C)	Total Sum of Bluefin (D) = (A+B+C)	Average Annual Bluefin (E) = D / 7 years
January	71	10	8	89	13
February	109	21	20	150	21
March	111	81	75	267	38
April	104	193	201	498	71
May	133	137	228	498	71
June	30	40	46	116	17
July	4	5	4	13	2
August	0	2	1	3	0
September	0	2	11	13	2
October	13	1	2	16	2
November	13	0	0	13	2
December	42	0	4	46	7
Grand total	630	492	600	1722	246

Table 3.18 Gulf of Mexico (Region-Wide) Bluefin Interactions Reported in the HMS Logbook from 2012 - 2014

Month	Bluefin Kept (A)	Bluefin Discarded Alive (B)	Bluefin Discarded Dead (C)	Total Sum of Bluefin (D) = (A+B+C)	Average Annual Bluefin (E) = D / 3 years
January	33	5	4	42	14
February	23	11	7	41	14
March	41	28	18	87	29
April	48	71	57	176	59
May	53	48	43	144	48
June	9	13	23	45	15
July	11	1	1	13	4
August	0	0	0	0	0
September	0	0	0	0	0
October	13	5	3	21	7
November	8	0	0	8	3
December	4	2	2	7	2
Grand total	243	184	157	584	195

Source: HMS logbook data.

Table 3.19 Gulf of Mexico (Region-Wide) Bluefin Interactions Reported in the HMS Logbook from 2015–2018

Month	Bluefin Kept (A)	Bluefin Discarded Alive (B)	Bluefin Discarded Dead (C)	Total Sum of Bluefin (D) = (A+B+C)	Average Annual Bluefin (E) = D / 4 years
January	8	3	3	14	4
February	7	3	4	14	4
March	20	16	27	63	16
April	7	11	7	25	6
May	9	29	11	49	12
June	15	46	19	80	20
July	4	11	2	17	4
August	0	4	1	5	1
September	0	1	0	1	0
October	0	2	1	3	1
November	0	1	1	2	1
December	1	1	2	4	1
Grand total	71	128	78	277	69

Source: HMS logbook data.

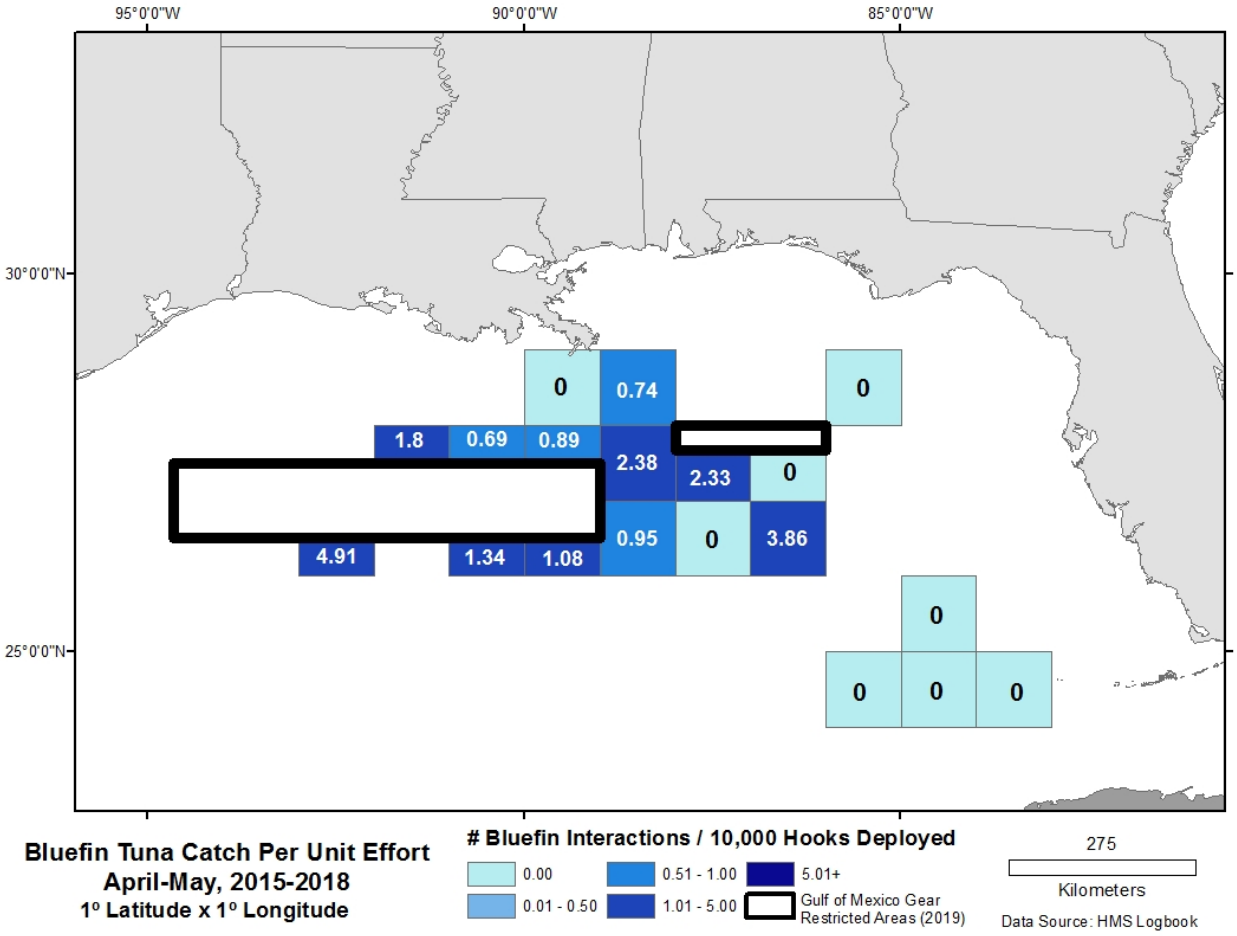

Figure 3.17 CPUE-Gulf of Mexico Total Bluefin Interactions
Source: HMS logbook data.

3.5.2.3 Individual Bluefin Quota (IBQ) Program

The Atlantic bluefin tuna fishery is a quota-managed fishery, and catch (landings and dead discards) must be accounted for within the available U.S. quota. The annual U.S. bluefin tuna quota (established by ICCAT) is allocated among seven domestic quota categories, including the Longline category. The non-longline quota categories include other commercial and recreational gear types and a Reserve category, used for research and inseason quota transfers as warranted. Most of these categories are for directed bluefin tuna fisheries (commercial hand gear, purse seine, and recreational fisheries); however, fishermen in the Longline category are not allowed to direct on bluefin tuna. Because the pelagic longline fishery incidentally catches bluefin tuna, while primarily targeting swordfish, yellowfin tuna, and bigeye tuna, the Longline quota category was established to provide the pelagic longline fishery with bluefin quota to account for that incidental bluefin catch. The IBQ Program was designed to provide individual vessel accountability for bluefin tuna catch (landings and dead discards). For additional information, please refer to the Three-Year Review of the IBQ Program.

IBQ Program and Bluefin Tuna Bycatch

The IBQ Program implemented by Amendment 7 enhanced accountability for bluefin tuna catch at the individual vessel level and is supported by several reporting and monitoring requirements. The broad elements of Amendment 7 and the IBQ Program are described above in Section 5.1.1. Quota

allocations under the IBQ Program, including annual and inseason distributions of bluefin tuna quota, and quota adjustments based on changes to the overall U.S. bluefin tuna quota pursuant to ICCAT, are described below.

Annual Distribution of Allocation

IBQ allocations are distributed to IBQ shareholders on January 1 of each year. A shareholder's share tier percentage is multiplied by the total pounds of Longline category quota available to derive the amount of allocation in pounds. The shareholder's percentage is defined by the shareholder's tier level: high (1.2 percent), medium (0.6 percent), or low (0.37 percent). If an IBQ shareholder has a permit that is not associated with a vessel, the relevant annual allocations of IBQ are not released to the shareholder's IBQ account until the permit is associated with a vessel.

Inseason Distribution of Allocation

NMFS may transfer bluefin tuna quota from the Reserve category to other quota categories throughout the year. These inseason transfers are based on consideration of regulatory determination criteria relating to the current circumstances in the fishery and the goals and objectives of the 2006 Consolidated HMS FMP, as amended. The regulations and processes pertaining to inseason transfers from the Reserve category to other categories are distinct from those regulations and processes that determine annual IBQ allocation distributions to shareholders. For each year since Amendment 7 was implemented, NMFS has transferred quota to the Longline category inseason to achieve specific objectives. These objectives include reducing quota debt, encouraging full accounting of bluefin tuna catch by vessels that may be in debt, fostering conditions in which permit holders become more willing to lease IBQ shares to other vessel owners, and reducing uncertainty in the fishery as a whole.

NMFS may distribute bluefin tuna quota inseason either to all IBQ share recipients or to only active vessels in the fishery, regardless of whether the vessels are IBQ share recipients. This option provides flexibility with respect to which vessels receive IBQ inseason transfers and allows NMFS to achieve the objectives of the IBQ Program, such as accounting for bluefin during longline operations and optimizing fishing opportunity for target species. Active vessels in this context are those with any fishing activity using pelagic longline gear over the course of the previous and subject year and are established with the required logbook, VMS, and/or EM data. Table 3.20 includes data on the annual (January 1), inseason, and combined (total) distributions of IBQ by shareholder tier. Table 3.21 summarizes various IBQ Program metrics regarding allocation, catch, fishing effort, leasing of IBQ, and reporting and monitoring. Both of these tables have been updated from the DEIS to the FEIS through the inclusion of an additional year of data (2018). Table 3.20 was updated with 2018 data published in the final draft of the Three-Year Review of the IBQ Program, which came available after publication of the DEIS for this rulemaking. Table 3.21 was updated with 2018 HMS Logbook data that became available after publication of the DEIS for this rulemaking.

Table 3.20 IBQ Allocations (t) to the Pelagic Longline Category by Share Tier (lb) in 2015–2018

	Quota Distribution	IBQ (t)	Date	IBQ (lb) to Each Eligible Shareholder*		
				High Tier (~1.2 %)	Medium Tier (~0.6 %)	Low Tier (~0.37 %)
2015	Annual allocation	137.3	January 1, 2015	3,616	1,808	1,124
	Transfer from Reserve category	34.0	July 28, 2015	551	551	551
	ICCAT baseline quota increase	11.0	August 28, 2015	292	146	90
	2015 Total	182.3		4,459	2,505	1,765
2016	Annual allocation	148.3	January 1, 2016	3,913	1,956	1,206
	Transfer from Reserve category	34.0	January 4, 2016	551	551	551
	2016 total	182.3		4,464	2,507	1,757
2017	Annual allocation	148.3	January 1, 2017	3,913	1,956	1,206
	Transfer from Reserve category**	45.0	March 2, 2017	1,102	1,102	1,102
	2017 total	193.3		5,015	3,058	2,308
2018	Annual allocation	148.3	January 1, 2018	3,913	1,956	1,206
	Transfer from Reserve category**	44.5	April 13, 2018	1,102	1,102	1,102
	ICCAT baseline quota increase	15.3	October 5, 2018	404	202	124
	2018 total	208.1		5,419	3,260	2,432

*Only allocated to eligible shareholders, for which the valid permit was associated with a vessel.
**Transfer from Reserve Category to active vessels only (vessels with recent fishing activity).
Data Source: Three-Year Review of the IBQ Program

Table 3.21 Bluefin Catch and Other Metrics of the IBQ Program (2015–2018)

Metric	2015	2016	2017	2018
Permits eligible for IBQ shares	136	136	136	136
# vessels that fished with pelagic longline gear	104	85	89	76
# vessels Landing Bluefin	59	55	58	50
Total weight bluefin landed (lb, ww)	157,388	196,142	229,396	193,969
Total weight bluefin landed (t, ww)	71.3	89.0	104.1	88
Landed in Gulf of Mexico (t, ww)	3.7	3.5	5.7	3.3
Landed in Atlantic (t, ww)	67.6	85.5	98.1	81.0
# Bluefin landed	323	447	501	467
# landed in Gulf of Mexico	15	13	21	12
# landed in Atlantic	308	424	480	455
metric tons (t) of NED* quota caught (max. 25 t)	24.9	17.3	25	4
Total bluefin dead discards (t, ww)	17.1	22.6	11.4	14.6
Discarded in Gulf of Mexico (t, ww)	5.6	7.1	6.5	3.6
Discarded in Atlantic (t, ww)	11.5	14.8	3.7	11
Discarded in NED* (t, ww)	0	0.7	1.2	0
# trips with pelagic longline gear	1,124	1,025	1,078	921
# pelagic longline sets	7,769	6,885	7,305	5,635
# hooks	5,549,451	5,217,547	5,327,587	4,030,875
Number of IBQ leases	49	81	85	83
Number of participants leasing	44	63	52	55
Average amount leased per transaction (lb)	2,580	1,743	1,789	2,050
Total amount leased (lb)	126,407	141,183	152,050	170,160
Average price per pound (weighted average)	$ 3.46	$ 2.52	$ 1.67	$2.02
#Trips (per VMS** prelanding declarations)	1,030	990	793	936
# Sets based on VMS bluefin reports	5,472	5,921	6,507	5,479
# Vessels with installed EM systems	111	113	112	112
# Hard drives received	785 (Jun-Dec)	975	1,020	925
# Vessels submitting hard drives	91 (Jun-Dec)	85	86	77

*NED = northeast distant area (See Figure 3.30). **VMS = Vessel Monitoring System

Sources: Dead discard data: POP and UDP; Landings, effort, and IBQ leasing data: UDP and IBQ Systems; VMS data; EM data: Saltwater, Inc. (NMFS contractor for installation and maintenance of EM systems) and ERT Corp. (NMFS contractor for review and storage of EM data).

Compliance with the Amendment 7 Regulations

The data indicate that, in general, compliance with the Amendment 7 regulations is high. For example, one of the reporting requirements is for dealers and vessel operators to report bluefin tuna landings and dead discards in the online IBQ System at the point of sale. The amount of landings of bluefin tuna, as indicated by data entered into the online IBQ System, was very similar to the amount derived from the preexisting mandatory bluefin tuna dealer reports, which was required for all commercially landed bluefin tuna regardless of gear type or geographic area.

In 2018, there was close correlation between the number of bluefin retained as reported in the VMS, and the number of bluefin landed as reported on bluefin tuna dealer reports (Figure 3.19; figure updated from the DEIS to the FEIS to reflect the most recent year of available data (2018)). Bluefin tuna dealer reports are maintained in the Commercial Bluefin Tuna Landings Database, also known as the electronic bluefin tuna landings database (eBFT).

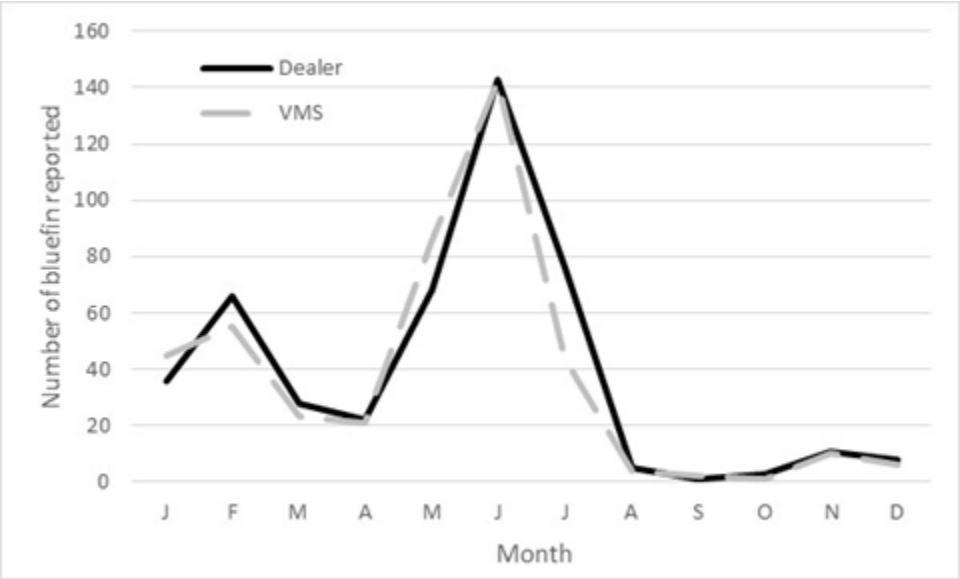

Figure 3.18 Number of Bluefin Tuna Reported Retained (VMS) vs. Number Landed (Dealer Data) in 2018 (Jan–Dec, 2018)
Sources: VMS; eBFT (dealer data).

Analyses presented in a formal review of the IBQ Program, the Three-Year Review of the IBQ Program, imply that the IBQ Program was successful in achieving its five objectives:

- Based on a review of the landings and dead discards during the IBQ period, the IBQ Program was considered successful in limiting bluefin tuna landings and dead discards in the pelagic longline fishery. Total bluefin tuna catch (landings and dead discards) after implementation of the IBQ Program was reduced compared to total bluefin catch prior to implementation of the IBQ Program.
- The substantial reduction in total bluefin tuna catch described in the Three-Year Review illustrated the effectiveness of the regulatory incentives to avoid bluefin tuna inherent in the IBQ Program. The regulatory incentives to avoid bluefin tuna catch resulted from the combination of requirements associated with the IBQ Program, including individual allocations of bluefin tuna, accountability for bluefin tuna catch, VMS reporting, video monitoring, and other regulations applicable to the pelagic longline fishery.

- The Three-Year Review found that the IBQ Program also provided flexibility in the quota system to enable pelagic longline vessels to obtain IBQ allocation from other vessels with available IBQ allocation in order to enable full accounting for bluefin tuna landings and dead discards, and minimize constraints on fishing for target species.
- The Three-Year Review found that the IBQ Program achieved the balance of limiting bluefin tuna landings and dead discards with the optimizing fishing opportunities and maintaining profitability. However, the Three-Year Review noted the difficulty in separating out the influence of the IBQ Program from other factors (including swordfish imports, other regulations such as closed areas, as well as target species availability), and it is likely that the IBQ Program contributed to reduced revenue and fishing effort during the IBQ period. Reductions in fishing effort during the first year of the IBQ Program may have been due to uncertainty regarding the new regulations, as well as the factors driving the long-term reduction in fishing effort.
- Analysis presented in the Three-Year Review implied that NMFS was able to successfully balance achieving the IBQ Program objectives with impacts on the permit categories that target bluefin tuna and on HMS dealers, as well as the broader objectives of the 2006 Consolidated HMS FMP and the Magnuson-Stevens Act.

3.6 Economic and Social Environment

This section provides a summary of socioeconomic information related to the pelagic longline fishery as a whole. Maps have been updated to include 2018 Logbook data, which became available after publication of the DEIS. Information on top HMS ports from 2015 through 2018 is available in Chapter 8. In general, average ex-vessel price for bluefin tuna, yellowfin tuna, and swordfish has been relatively stable between 2015 and 2018 and varied by $0.24, $0.50, and $0.47 per pound, respectively (Table 3.22). Total landings for bluefin and yellowfin tunas have generally increased (with some variability) since 2015, however landings of swordfish decreased by ~ 826,000 lb between 2015 and 2018. Ex-vessel annual revenue data trends are similar to those of total landings. In considering spatially referenced set revenue data (Figure 3.20 and Figure 3.21), the locations with the highest average set revenue tend to be in the U.S. Caribbean, off Trinidad and Tobago, west of the Florida Keys, and in high seas areas seaward of the Bahamian EEZ. However, locations with the highest set revenue are closer to shore. Therefore, locations that tend to generate lower average revenue per set still produce the most revenue overall.

For more information on the overall economic status of HMS fisheries, please see the most recent HMS SAFE Report.

Table 3.22 Average Target Species Ex-Vessel Prices, and Overall Ex-Vessel Revenue (2015–2018)

Species	Year	Annual Landings (lb dw)	Average Ex-Vessel Price (per lb)	Ex-Vessel Annual Revenue
Bluefin tuna	2015	1,347,920	$6.45	$8,716,613
	2016	1,522,634	$7.23	$11,008,644
	2017	1,490,321	$6.45	$9,581,816
	2018	1,587,794	$6.99	$11,010,617
Yellowfin tuna	2015	1,965,050	$3.71	$8,494,781
	2016	2,351,936	$3.53	$9,622,286
	2017	2,637,684	$3.70	$10,918,095
	2018	1,543,898	$4.03	$7,052,949
Swordfish	2015	2,576,537	$4.07	$10,175,662
	2016	2,488,044	$4.54	$10,351,695
	2017	2,019,857	$4.32	$9,012,183
	2018	1,750,631	$4.10	$7,540,277

Sources: HMS eDealer database, 2018 HMS SAFE Report.

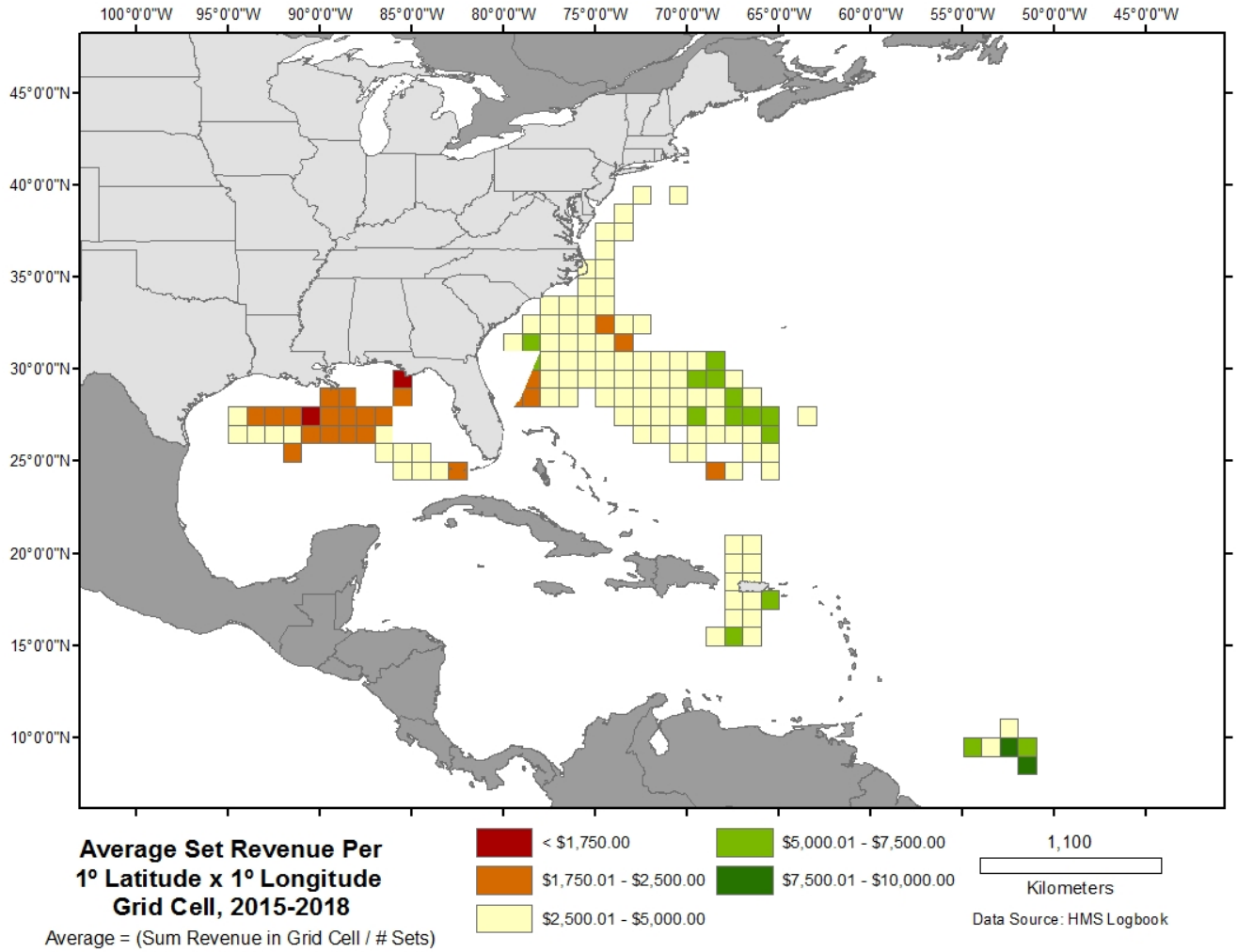

Figure 3.19 Average Pelagic Longline Set Revenue (2015–2018) by One Degree Grids
Source: HMS logbook data.

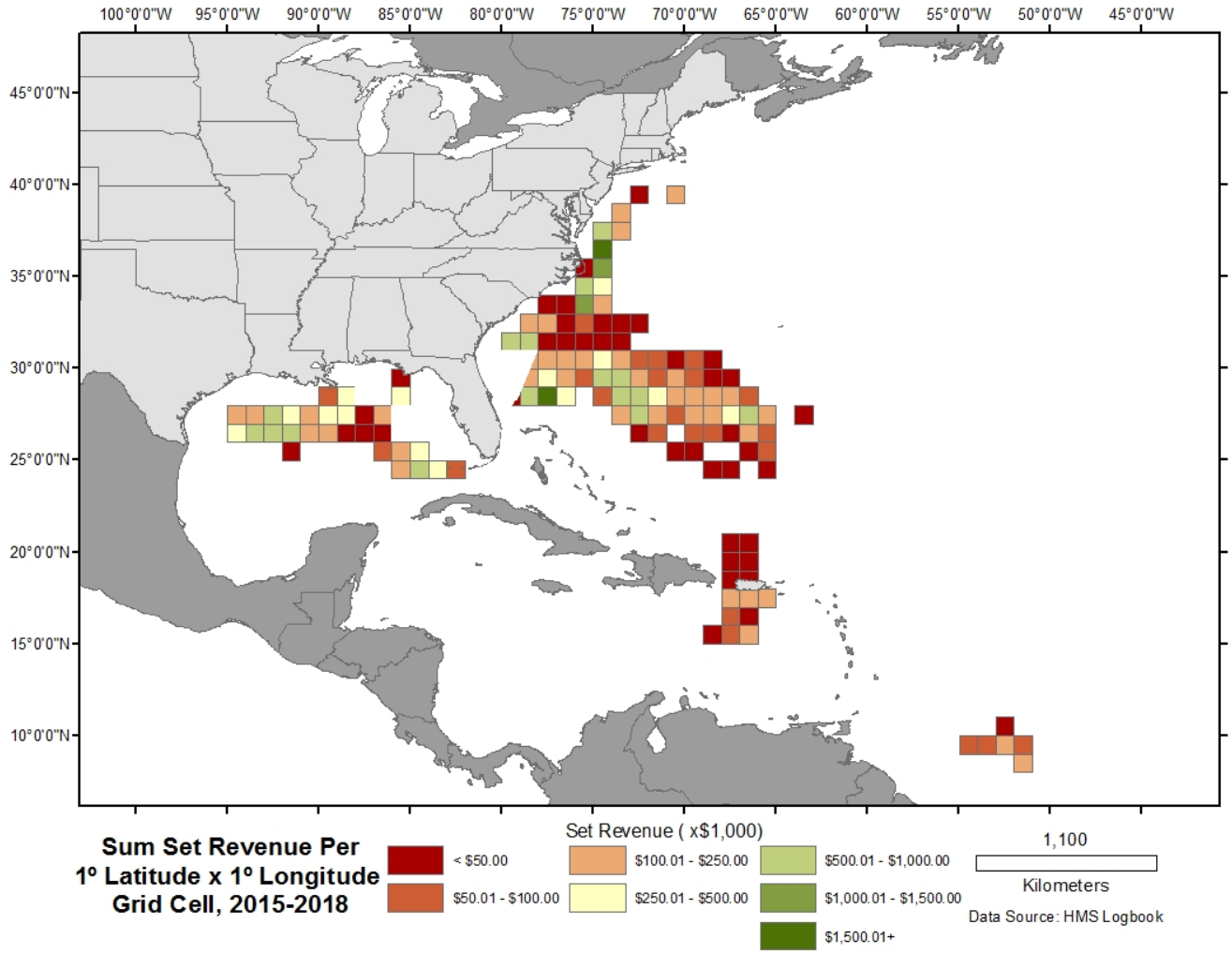

Figure 3.20 Sum of Set Revenue (2015–2018) by One Degree Grids
Source: HMS logbook data.

3.7 Bycatch and Protected Species Management and Data

This section summarizes information on Atlantic HMS fisheries bycatch, including fish species managed under the Magnuson-Stevens Act and protected species interactions addressed by other regulatory programs. The HMS SAFE Report provides additional information on species protected under the MMPA, ESA, and the Migratory Bird Treaty Act, including a description of the Pelagic Longline Take Reduction Team, Take Reduction Plan, and measures to address protected species concerns. The interaction of seabirds and longline fisheries are also considered under the United States "National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries" (NPOA-Seabirds). The pelagic observer program, the primary tool used to monitor bycatch, is discussed in further detail in the HMS SAFE Report (e.g., observer coverage).

To minimize bycatch and bycatch mortality in the domestic pelagic longline fishery, NMFS implemented regulations to close certain areas to this gear type (see Figure 3.4) and has banned the use of live bait by pelagic longline vessels in the Gulf of Mexico.

In addition to the regulations mentioned above, to protect sea turtles, vessels using pelagic longline gear onboard must, at all times, in all areas open to pelagic longline fishing except the Northeast distant, possess onboard and/or use only 16/0 or larger non-offset circle hooks and/or 18/0 or larger circle hooks with an offset not to exceed 10 degrees. Only whole finfish and squid baits may be possessed and/or utilized with allowable hooks. Vessels fishing in the Northeast distant are required to use 18/0 or larger circle hooks with an offset not to exceed 10 degrees and whole mackerel or squid baits. All pelagic longline vessels must possess and use sea turtle handling and release gear in compliance with NMFS careful release protocols. Additionally, all pelagic longline vessel owners and operators must be certified in the use of the protected species handling and release gear. Certification must be renewed every three years and can be obtained by attending a training workshop. Approximately 18 to 24 workshops are conducted annually, and they are held in areas with significant numbers of pelagic longline permit holders.

In 2009, to protect pilot whales and Risso's dolphins, the Pelagic Longline Take Reduction Plan (PLTRP) (74 FR 23349, May 19, 2009) included a requirement that pelagic longline vessel operators fishing in the Cape Hatteras Special Research Area must contact NMFS at least 48 hours prior to a trip, and carry observers if requested. The PLTRP also established a 20 nautical mile upper limit on mainline length for all pelagic longline sets in the Mid-Atlantic Bight, and required that an informational placard be displayed in the wheelhouse and on the working deck of all active pelagic longline vessels in the Atlantic fishery.

3.7.1 Bycatch Interactions and the Magnuson Stevens Act

Under the Magnuson-Stevens Act, "bycatch" has a very specific meaning: "Fish which are harvested in a fishery, but which are not sold or kept for personal use, and includes economic discards and regulatory discards. Such term does not include fish released alive under a recreational catch and release fishery management program" (16 U.S.C. §1802(2)). Fish is defined as finfish, mollusks, crustaceans, and all other forms of marine animal and plant life other than marine mammals and birds (§1802(12)). Birds and marine mammals are therefore not considered bycatch under the Magnuson-Stevens Act.

National Standard 9 of the Magnuson-Stevens Act requires that fishery conservation and management measures shall, to the extent practicable, minimize bycatch and minimize the mortality of bycatch that cannot be avoided (16 U.S.C. §1851(a)(9)). In many fisheries, it is not practicable to eliminate all bycatch and bycatch mortality. Some relevant examples of fish caught in Atlantic HMS fisheries as bycatch or incidental catch are marlin, undersized swordfish, and bluefin tuna by commercial fishing gear; undersized swordfish and tunas in recreational hook and line fisheries; species for which there is little or no market such as blue sharks; species caught and released in excess of a bag limit; and prohibited species such as those in the prohibited shark complex and longbill spearfish. Table 3.23 lists methods that are employed to reduce bycatch in the Atlantic HMS fisheries.

As very few legal fishing gears are perfectly selective for the target species of each fishing operation, expecting to eliminate bycatch of all non-target species in Atlantic HMS fisheries would be impractical. The goal of bycatch reduction, therefore, is to minimize the amount of bycatch to the extent practicable and safely minimize the mortality of species caught as bycatch.

Table 3.23 Bycatch Reduction Methods in the Atlantic HMS Fisheries

Commercial Fisheries	Recreational Fisheries
Gear modifications (including hook and bait types)	Circle hooks (mortality reduction only)
Circle hooks	Formal voluntary or mandatory catch-and-release program for all fish or certain species
Weak hooks	Prohibiting retention of fish
Time/area closures	Education/outreach
Performance standards	De-hooking devices (mortality reduction only)
Education/outreach	
Effort reductions (i.e., limited access)	
De-hooking devices (mortality reduction only)	
Prohibiting retention of fish	

NMFS scientists and managers continue to consult as necessary on reporting methodology design considerations, including changes in monitoring and reporting technology, to improve the quality of target and non-target catch estimates as needed while considering cost, technical, and operational feasibilities. NMFS uses mandatory self-reported logbook data (HMS and Coastal Fisheries Logbook Programs, including a supplemental discard report), at-sea observer data (the Pelagic Longline, Southeast Gillnet, and Bottom Longline Observer Programs), mandatory recreational fish landings reports, online reporting of dead discards of bluefin tuna in the commercial harpoon and hook and line fisheries (Atlantic Catch and Landings Reporting Site), and survey data (recreational fishery dockside intercept and telephone surveys) to produce bycatch estimates for HMS fisheries. The incidental catch of bluefin tuna in the pelagic longline fishery is monitored electronically via camera array, and catch reporting via VMS. Post-release mortality of HMS is considered in stock assessments to the extent that the data allow. Fishing mortality estimates from these sources of information, as incorporated in stock assessments, are critical to understanding the overall status and outlook of a stock as well as helping to understand the available options for conservation and management measures for the stock and potential implications for the ecosystem in which it lives.

3.7.2 Bycatch Data

NMFS collects data on the disposition (released alive or dead) of bycatch species from logbooks submitted by fishermen in the pelagic longline fishery. Observer reports also include disposition of the catch as well as information on hook location, trailing gear, and injury status of protected species interactions. These data are used to estimate post-release mortality of sea turtles and marine mammals based on guidelines for each (Angliss and DeMaster 1998, Ryder et al. 2006). Bycatch information is summarized extensively in the HMS SAFE Report (see Chapter 8 of the 2017 and 2018 versions).

The pelagic longline fishery encounters a variety of species in addition to the target species, including sea turtles, marine mammals, seabirds, sharks, and bluefin tuna. Data on bluefin tuna bycatch (i.e., discarded fish) is also available in Section 3.5.2.2 which summarizes some trends across the fishery (e.g., Table 3.7 and Table 3.9), and for specific spatially managed areas (e.g., Sections 3.5.2.1-Section 3.5.2.3). Information about Atlantic HMS bycatch since implementation of Amendment 7 measures are shown in Table 3.24. In recent years (from 2015 to 2017), the number of swordfish, blue marlin, and large coastal shark discards have increased by approximately 32 percent, 58 percent, and 30 percent, respectively (Table 3.24). However, between 2015 and 2017

the number of white marlin discards, sailfish discards, and pelagic shark discards have decreased by 23 percent, 8 percent, and 43 percent, respectively. Bluefin tuna dead discards increased by 9 percent between 2015 (n = 210 fish) and 2017 (n = 229 fish); however, the increase in bluefin tuna reported discards in 2016 is notable (n = 582) (see Table 3.21 for IBQ and pelagic longline fishing trends such as number of hooks and sets deployed occurring currently with this bycatch). While some variability from year-to-year is expected depending on a variety of factors (i.e., fishing conditions, distribution of bluefin, distribution of target species, etc.), these numbers are on average lower than dead discards reported in years prior to implementation. Projected numbers of discards associated with these bycatch species are associated with the ecological analysis of alternatives in Chapter 4. Appendix B also provides a summary of white marlin interactions as bycatch in a discussion of weak hook data, showing a statistically significant increase in white marlin bycatch with the use of weak hooks. This statistically significant increase in white marlin bycatch is notable, given that the seasonal application of weak hooks could reduce Gulf of Mexico bycatch occurring in the second half of the year.

Spatial trends in catch-per-unit effort of HMS bycatch for 2015-2018 were mapped (Figures 3.22 - Figures 3.29). The maps have been updated from the DEIS to the FEIS through the inclusion of an additional year of data (2018), and are summarized here:

- Most of the bluefin tuna discards occurred in locations near the edge of the continental shelf break, in the NED, and in the central Gulf of Mexico (Figure 3.21).
- Swordfish discard catch-per-unit effort was high primarily along the continental shelf break from Georges Bank to the northern border of the Florida East Coast Closed Area, along the west Florida shelf, and in the central Gulf of Mexico (Figure 3.22).
- Dusky shark discard catch-per-unit effort was highest off North Carolina (Figure 3.23).
- Blue marlin discard catch-per-unit effort was highest along and seaward of the U.S. east coast continental shelf break, off the west Florida shelf, and the U.S. Caribbean (Figure 3.24).
- White marlin discard catch-per-unit effort was highest along and seaward of the U.S. east coast continental shelf, in the high seas east of the Bahamian EEZ, and in the U.S. Caribbean (Figure 3.25).
- Roundscale spearfish discard catch-per-unit effort was greatest in the high seas east of the Bahamian EEZ, and in the U.S. Caribbean (Figure 3.26).
- Sailfish discard catch-per-unit effort was highest in the South Atlantic Bight, in the Gulf of Mexico, and in the U.S. Caribbean (Figure 3.27).
- Shortfin mako discards were highest in the Mid-Atlantic Bight, off Georges Bank, and in the Grand Banks/NED (Figure 3.28).

Table 3.24 Reported Numbers of Catch in the U.S. Atlantic Pelagic Longline Fishery (2015–2017)

Species	2015	2016	2017
Swordfish discarded	5,382	4,437	7,116
Blue marlin discarded	990	1,050	1,562
White marlin discarded	2,885	2,153	2,221
Sailfish discarded	715	855	657
Bluefin tuna discarded	210	582	229
Pelagic sharks discarded	45,082	27,900	25,564
Large coastal sharks discarded	8,839	9,549	11,533

Source: HMS logbook data.

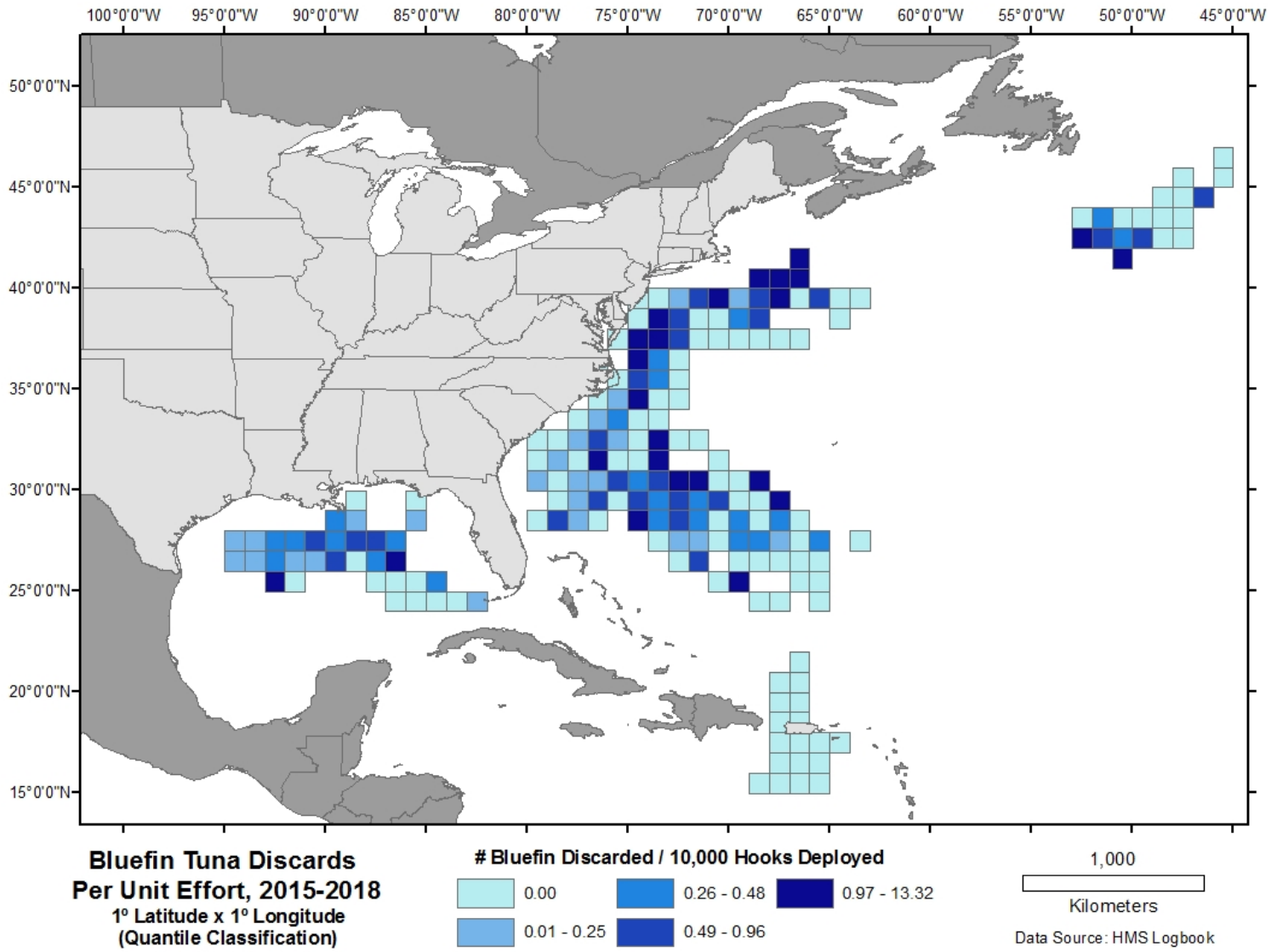

Figure 3.21 Spatial Distribution of Bluefin Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

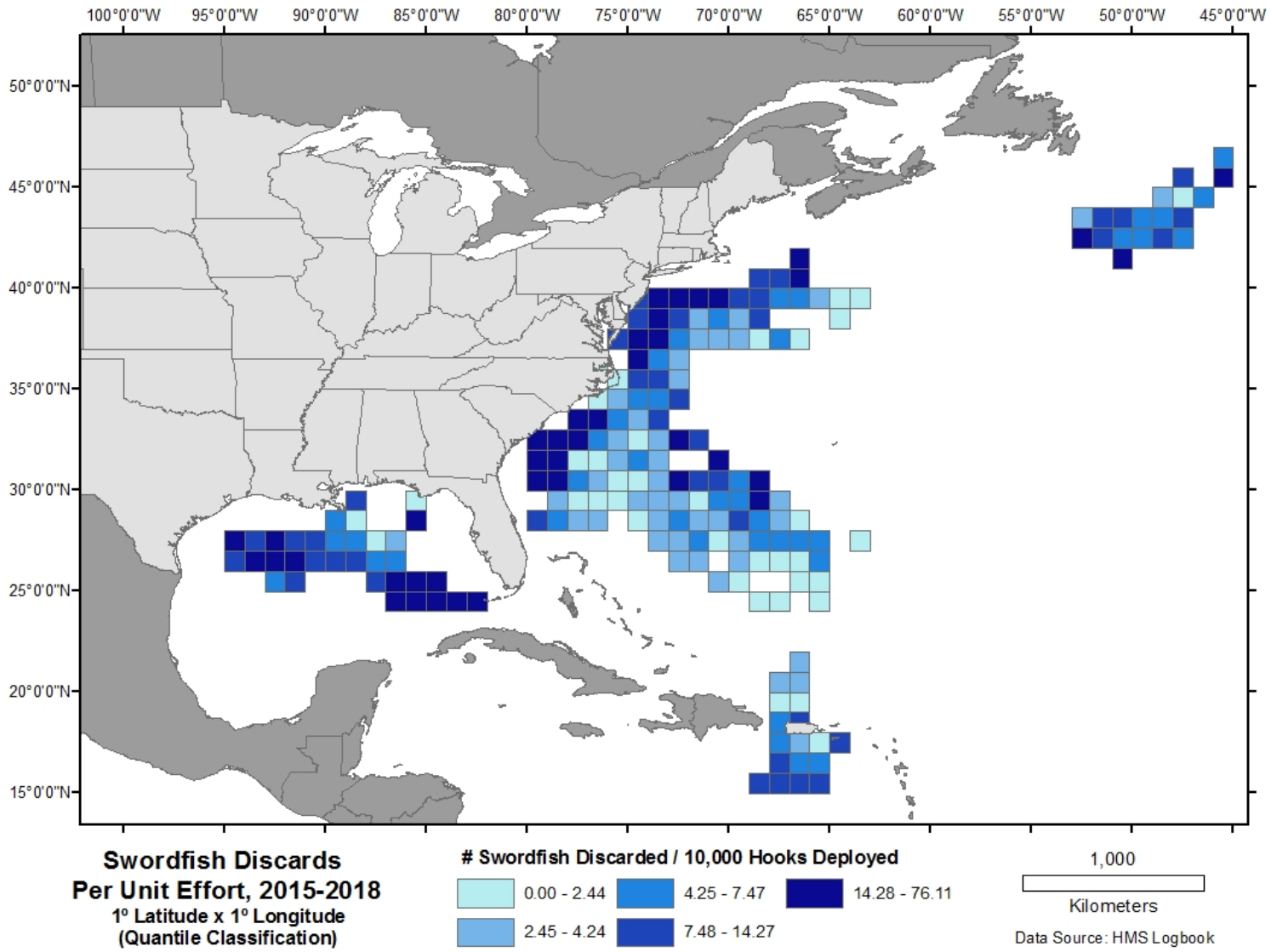

Figure 3.22 Spatial Distribution of Swordfish Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

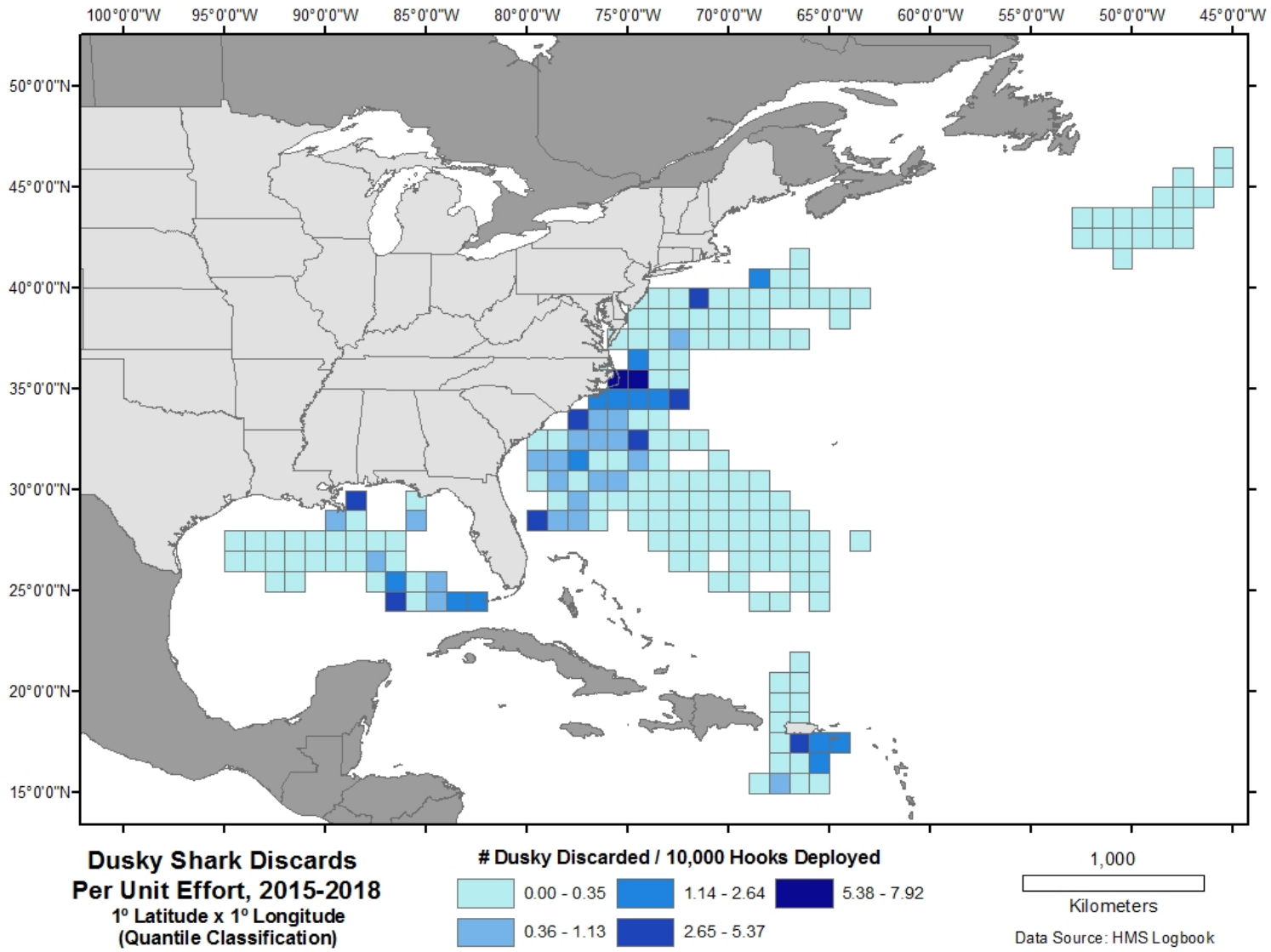

Figure 3.23 Spatial Distribution of Dusky Shark Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

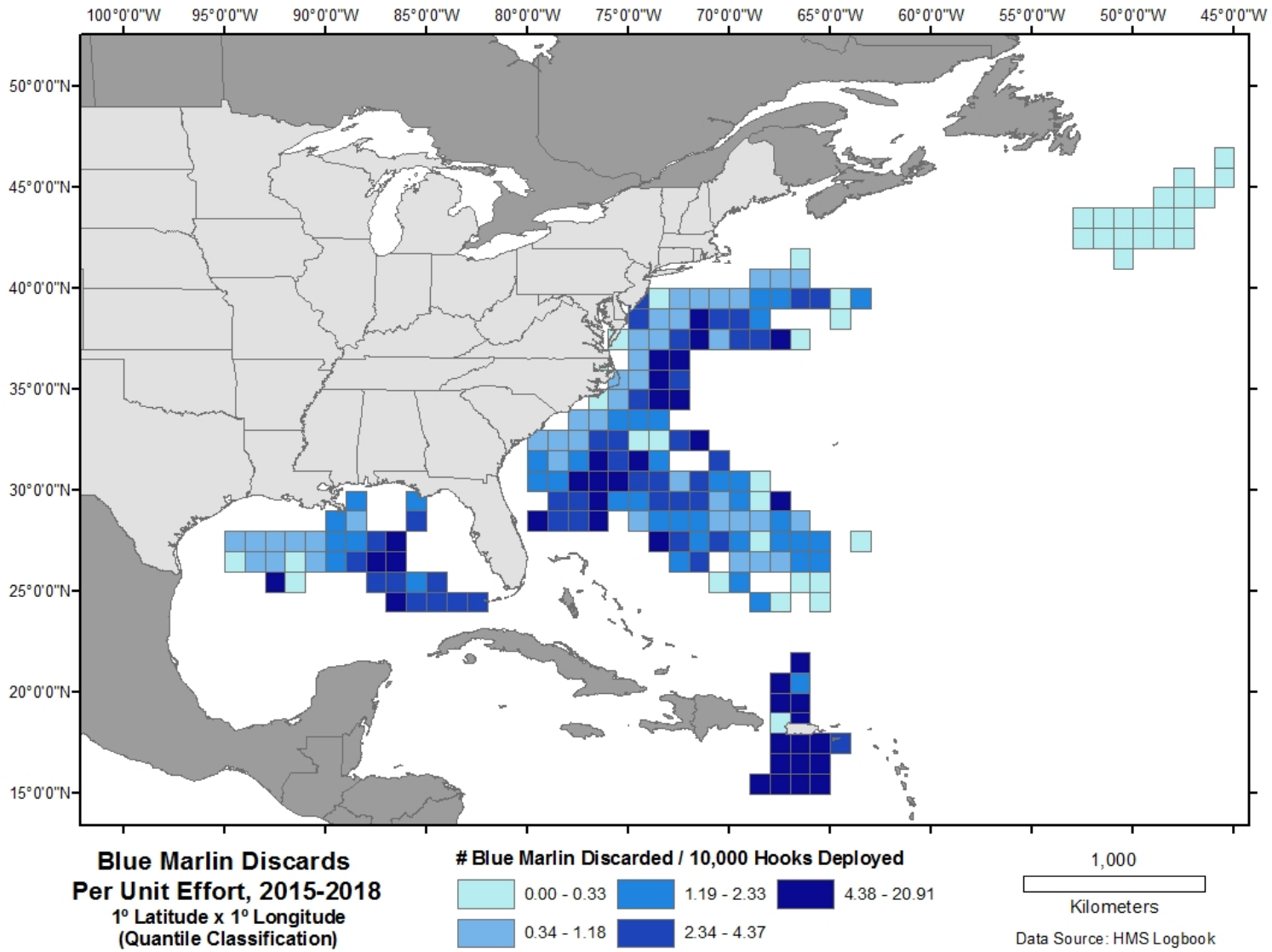

Figure 3.24 Spatial Distribution of Blue Marlin Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

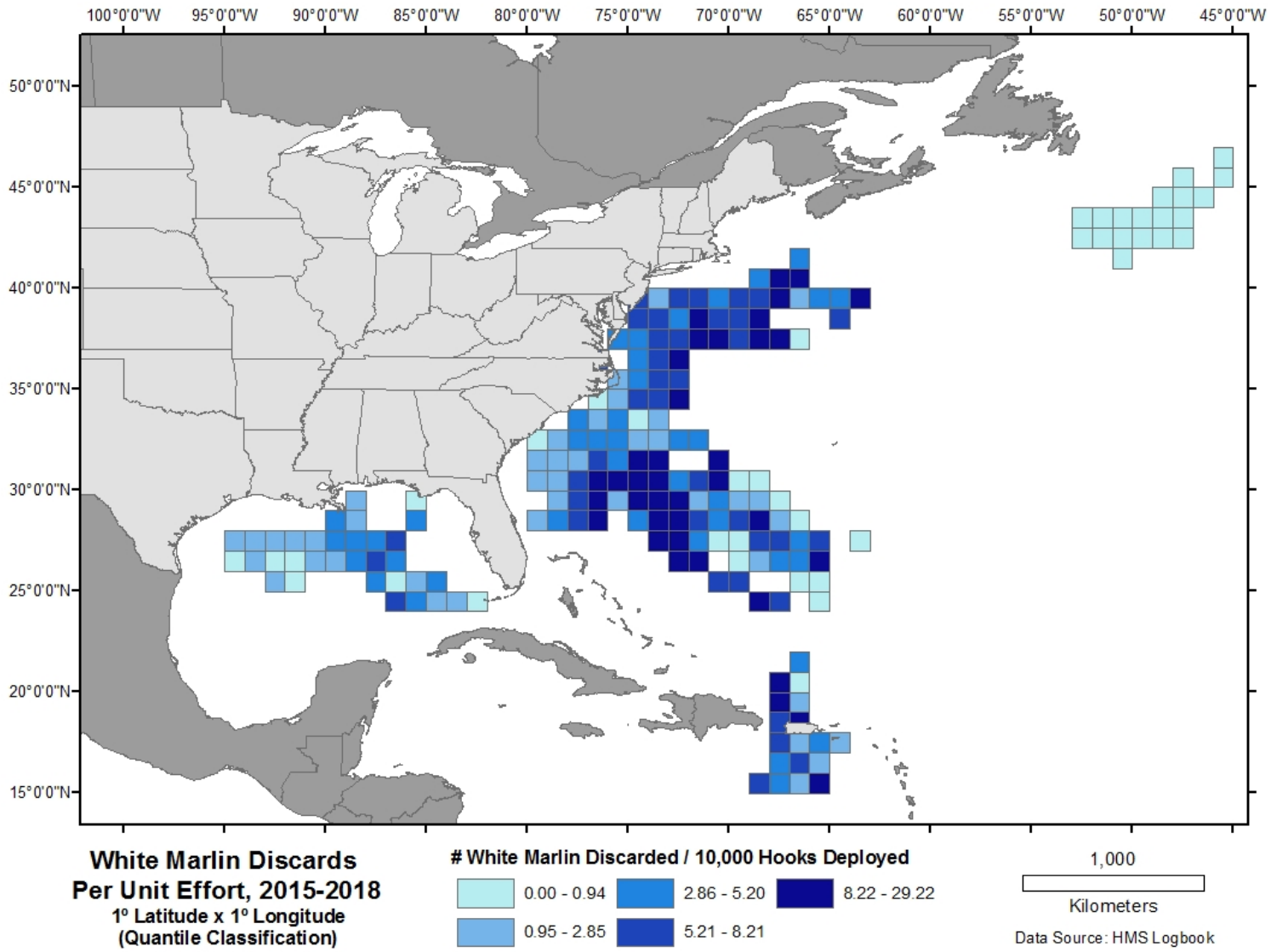

Figure 3.25 Spatial Distribution of White Marlin Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

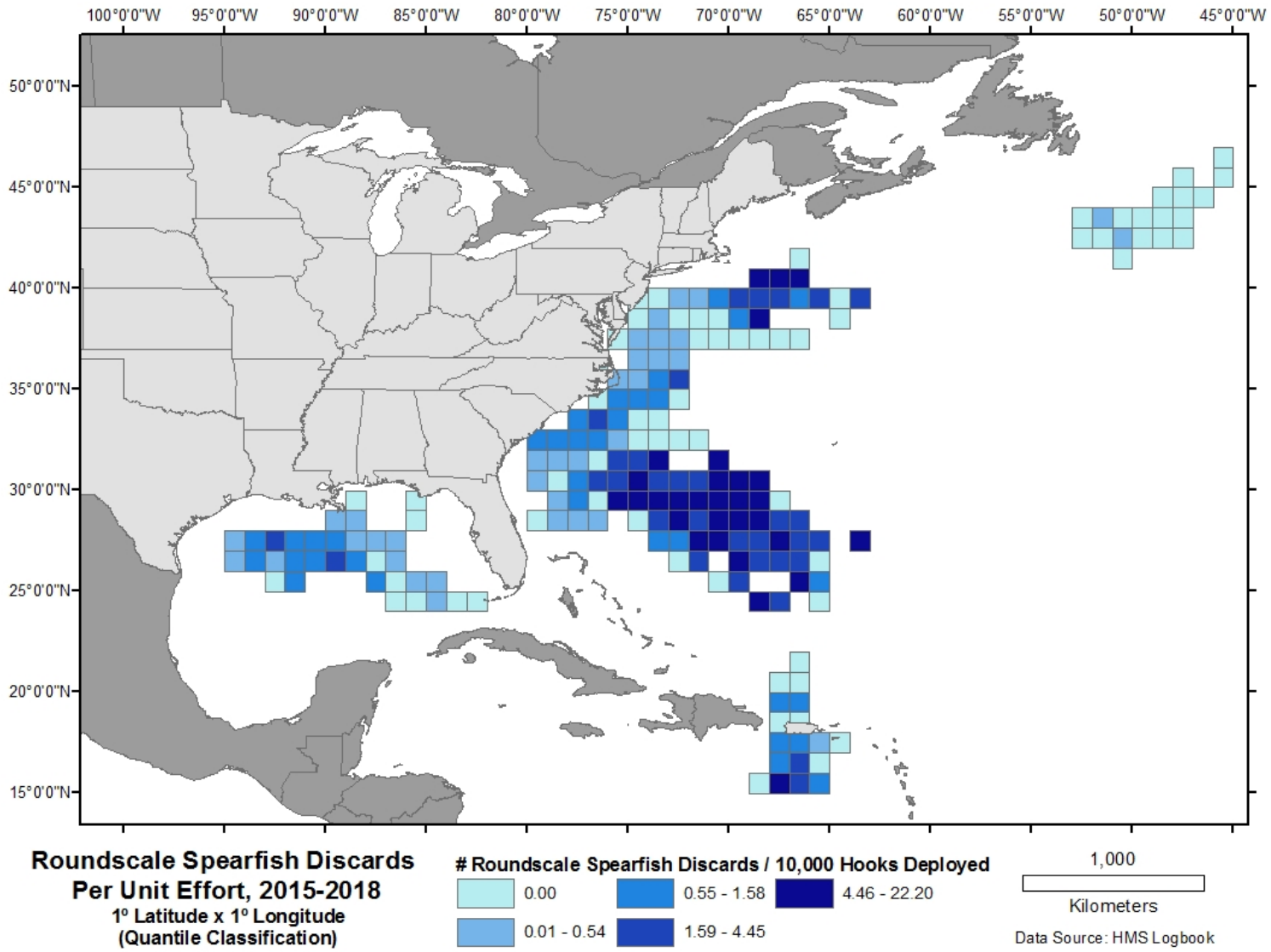

Figure 3.26 Spatial Distribution of Roundscale Spearfish Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

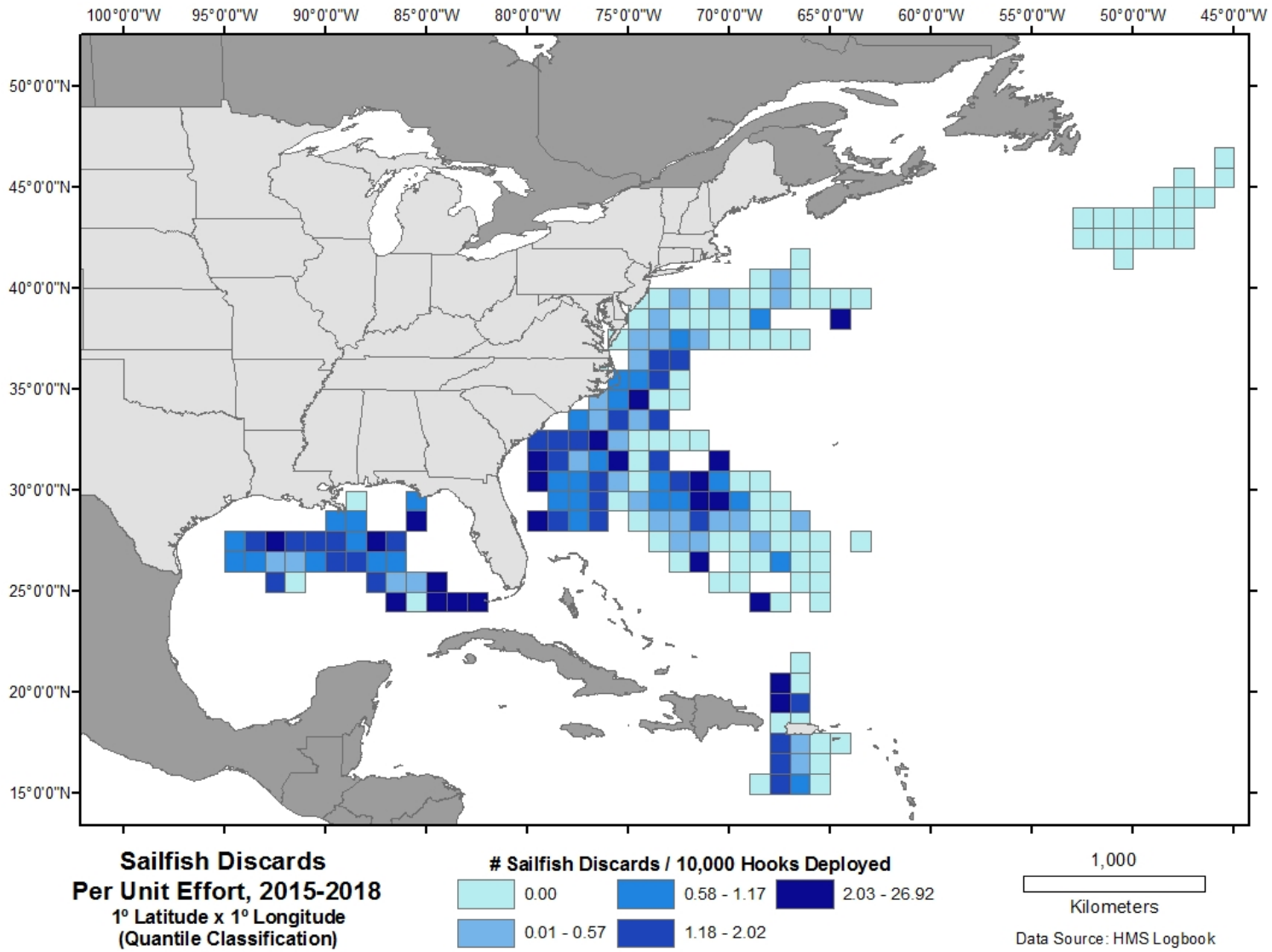

Figure 3.27 Spatial Distribution of Sailfish Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

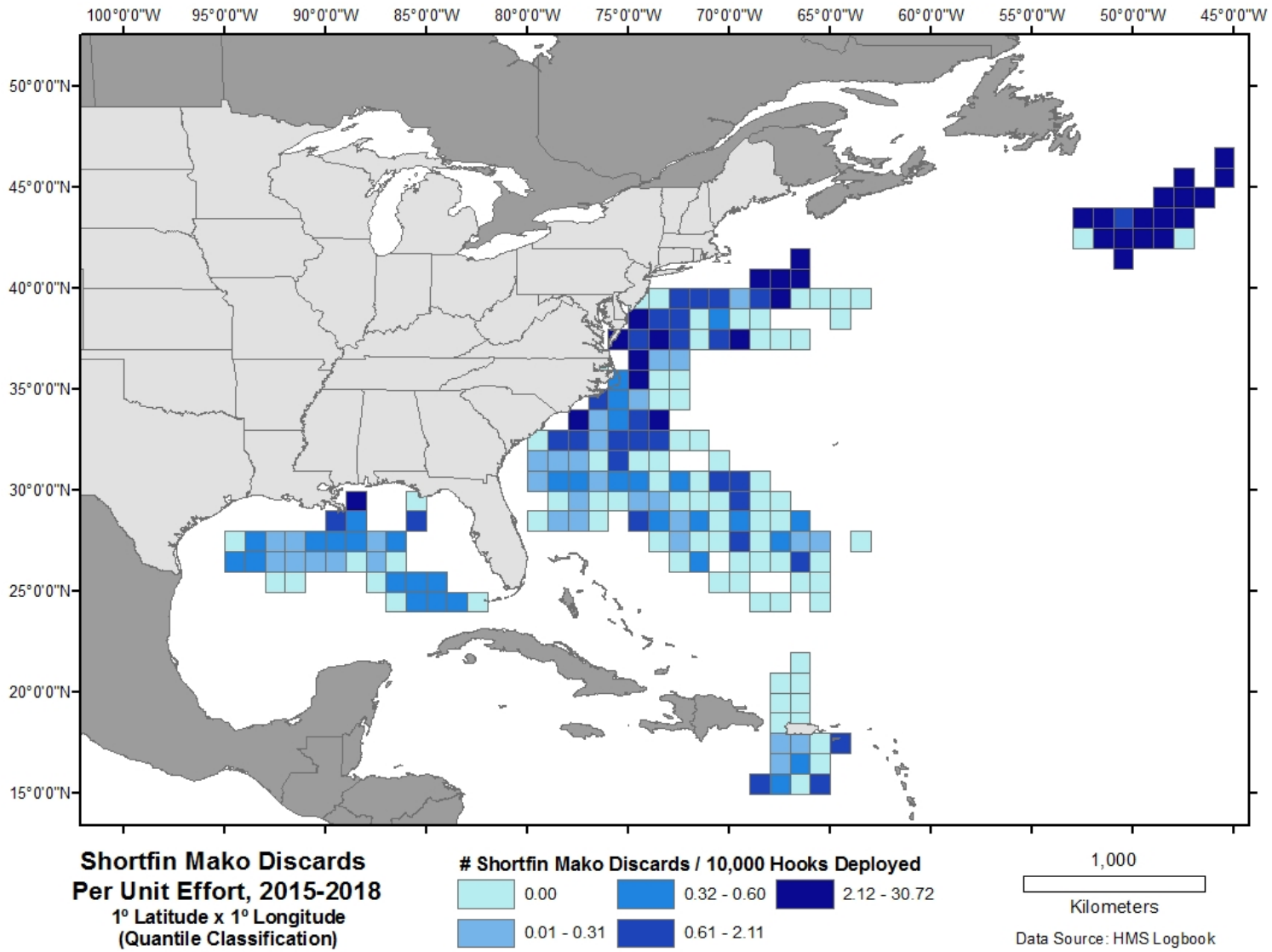

Figure 3.28 Spatial Distribution of Shortfin Mako Discards within the Pelagic Longline Fishery
Source: HMS logbook data.

3.7.3 Interactions and the MMPA

The MMPA of 1972 as amended is one of the principal Federal statutes guiding marine mammal species protection and conservation policy. In the 1994 amendments, section 118 established the goal that the incidental mortality or serious injury of marine mammals occurring during the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality rate goal and serious injury rate within seven years of enactment (*i.e.*, April 30, 2001). In addition, the amendments established a three-part strategy to govern interactions between marine mammals and commercial fishing operations. These include the preparation of marine mammal stock assessment reports, a registration and marine mammal mortality monitoring program for certain commercial fisheries (Category I and II), and the preparation and implementation of take reduction plans. NMFS relies on both fishery-dependent and fishery-independent data to produce stock assessments for marine mammals in the Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea. Marine mammal species that occur off the Atlantic and Gulf Coasts that are or could be of concern with respect to potential interactions with HMS fisheries are included in Table 3.25.

Table 3.25 List of Marine Mammals under the Protection of the MMPA

Common Name	Scientific Name	Common Name	Scientific Name
Atlantic spotted dolphin	*Stenella frontalis*	Northern right whale	*Eubalaena glacialis*
Blue whale	*Balaenoptera musculus*	Pygmy sperm whale	*Kogia breviceps*
Bottlenose dolphin	*Tursiops truncatus*	Risso's dolphin	*Grampus griseus*
Common dolphin	*Delphinis delphis*	Sei whale	*Balaenoptera borealis*
Fin whale	*Balaenoptera physalus*	Short-beaked spinner dolphin	*Stenella clymene*
Harbor porpoise	*Phocoena*	Short-finned pilot whale	*Globicephela macrorhynchus*
Humpback whale	*Megaptera novaeangliae*	Sperm whale	*Physeter macrocephalus*
Killer whale	*Orcinus orca*	Spinner dolphin	*Stenella longirostris*
Long-finned pilot whale	*Globicephela melas*	Striped dolphin	*Stenella coeruleoalba*
Minke whale	*Balaenoptera acutorostrata*	White-sided dolphin	*Lagenorhynchus acutus*
Northern bottlenose whale	*Hyperoodon ampullatus*		

1. Category I fisheries are those with frequent serious injury or incidental mortality to marine mammals.
2. Category II fisheries are those with occasional serious injury or incidental mortality.
3. Category III fisheries are those with remote likelihood of serious injury or known incidental mortality to marine mammals.

The most recent MMPA LOF was published on May 16, 2019 (84 FR 22051). The Atlantic Ocean, Caribbean, and Gulf of Mexico large pelagic longline fishery is classified as Category I. Fishermen participating in Category I or II fisheries are required to register under the MMPA and to accommodate an observer aboard their vessels if requested. Vessel owners or operators, or fishermen, in Category I, II, or III fisheries must report all incidental mortalities and serious injuries of marine mammals during the course of commercial fishing operations to NMFS. There are currently no regulations requiring recreational fishermen to report takes, nor are they authorized to have incidental takes (*i.e.*, they are illegal).

Many of the marine mammals that are hooked by U.S. pelagic longline fishermen are released alive, although some animals suffer serious injuries and may die after being released. The observed and estimated marine mammal interactions for 2013 to 2017 are summarized in Table 3.26. Marine mammals are caught primarily during the third and fourth quarters in the Mid Atlantic Bight (MAB), and during the second quarter in the South Atlantic Bight (SAB). These geographic areas are illustrated in Figure 3.30, below. In 2017, the majority of observed interactions were with short-finned pilot whales (Garrison, unpublished data). NMFS monitors observed interactions with sea turtles and marine mammals on a quarterly basis and reviews data for appropriate action, as necessary.

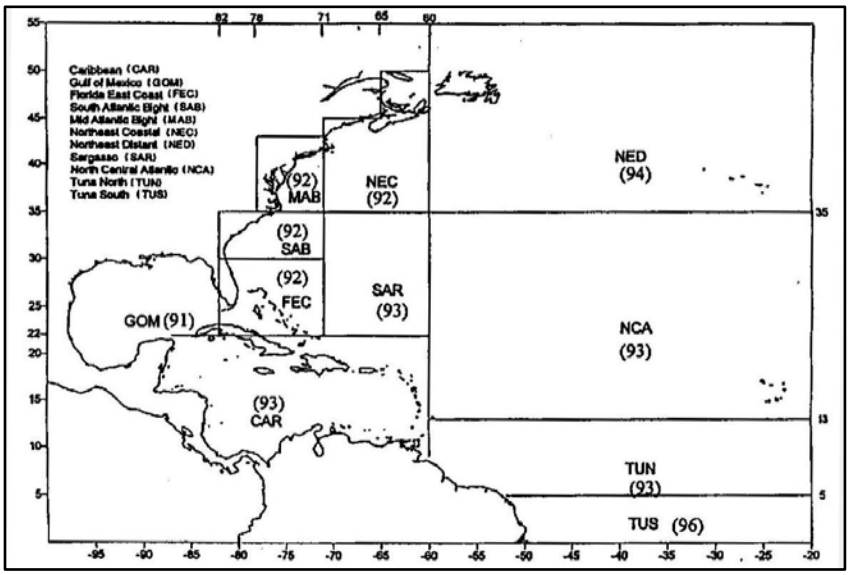

Figure 3.29 Geographic Areas Used in Summaries of Pelagic Logbook Data

The geographic zones are referred to as Caribbean (CAR), Gulf of Mexico (GOM), Florida east coast (FEC), south Atlantic bight (SAB), mid-Atlantic bight (MAB), northeast coastal (NEC), northeast distant (NED), Sargasso Sea (SAR), north central Atlantic (NCA), tuna north (TUN), and tuna south (TUS).
Source: Cramer and Adams 2000.

Table 3.26 Marine Mammal Interactions in the Atlantic Pelagic Longline Fishery (2015-2017)

Year	Species	Total		Mortality		Serious Injury*		Alive*	
		Obs.	Est.	Obs.	Est.	Obs.	Est.	Obs.	Est.
2015	Beaked whale	1	4.0	-	-	1	4.0	-	-
	Bottlenose dolphin	1	4.7	-	-	-	-	1	4.7
	Common dolphin	2	14.4	-	-	1	9.0	1	5.4
	Risso's dolphin	2	8.4	-	-	2	8.4	-	-
	Short-finned pilot whale	38	233.5	-	-	32	202.9	6	30.7
	Sperm whale	1	1.3	-	-	1	1.3	-	-
	Unidentified dolphin	2	8.5	-	-	-	-	2	8.5
	Unidentified marine mammal	2	10.5	-	-	1	5.8	1	4.7
2016	Long-finned pilot whale***	0.3	1.3	-	-	0.2	1.1	0.1	0.2
	Risso's dolphin	4	22.0	1	5.6	1.5	10.5	1.5	5.9
	Short-finned pilot whale***	22.7	130.8	-	5.1	19.3	111.1	3.4	14.6
	Unidentified dolphin	2	9.3	-	-	1	1.2	1	8.1
	Unidentified marine mammal	2	4.1	-	-	0.5	0.8	1.5	3.3
	Unidentified whale	1	9.2	-	-	0.5	4.7	0.5	4.5
2017	Common dolphin	1	4.9	-	-	1	4.9	0	-
	Long-finned pilot whale***	1.3	15.6	-	-	0.3	3.3	1	12.3
	Risso's dolphin	1	7.7	-	-	0	-	1	7.7
	Short-finned pilot whale***	29.7	340.3	-	-	14	132.9	15.7	207.4
	Unidentified dolphin	1	5.3	-	-	0	-	1	5.3
	Unidentified marine mammal	2	11.7	-	-	0	-	2	11.7

Obs.= observed; Est.= estimated.
*Cases where serious injury cannot be determined based upon available data are partitioned based upon observed serious injury rates from past interactions. This results in proportional assignment of observed animals to the serious injury and alive categories.
**Pantropical spotted dolphin was observed dead in an experimental set.
***Pilot whales are not identified to species at sea by observers. Observed interactions are partitioned between the two species based upon location, water depth, and sea surface temperature at the time of the interaction.
Sources: Garrison and Stokes, 2012, 2013, 2014. Garrison 2015, 2016, 2017—unpublished data.

3.7.4 Interactions and the ESA

The ESA of 1973, as amended (16 U.S.C. 1531 et seq.), provides for the conservation and recovery of endangered and threatened species of fish, wildlife, and plants. The listing of a species is based on the status of the species throughout its range or in a specific portion of its range in some instances. Threatened species are those likely to become endangered in the foreseeable future [16 U.S.C. § 1532(20)] if no action is taken to stop the decline of the species. Endangered species are those in danger of becoming extinct throughout all or a significant portion of their range [16 U.S.C. § 1532(20)]. Species can be listed as endangered without first being listed as threatened. The Secretary of Commerce, acting through NMFS, is authorized to list marine and anadromous fish species, marine mammals (except for walrus and sea otter), marine reptiles (such as sea turtles), and marine plants. The Secretary of the Interior, acting through the US Fish and Wildlife Service

(USFWS), is authorized to list walrus and sea otter, seabirds, terrestrial plants and wildlife, and freshwater fish and plant species.

In addition to listing species under the ESA, the service agency (NMFS or USFWS) generally must designate critical habitat for listed species concurrently with the listing decision to the "maximum extent prudent and determinable" [16 U.S.C. §1533(a)(3)]. The ESA defines critical habitat as those specific areas that are occupied by the species at the time it is listed that are essential to the conservation of a listed species and that may be in need of special consideration, as well as those specific areas that are not occupied by the species that are essential to their conservation. Federal agencies are prohibited from undertaking actions that are likely to destroy or adversely modify designated critical habitat.

NMFS reinitiated consultation over the effects of the pelagic longline fishery on listed species under Section 7 of the ESA. NMFS also reinitiated consultation over the effects of the non-pelagic longline HMS fisheries.

Below is the list of ESA-listed species within the action area for this action and with which the HMS fisheries that are the subject of this action may interact.

Marine Mammals	**Status**
Blue whale *(Balaenoptera musculus)*	Endangered
Fin whale *(Balaenoptera physalus)*	Endangered
Humpback whale *(Megaptera novaeangliae)*	Endangered
Northern right whale *(Eubalaena glacialis)*	Endangered
Sei whale *(Balaenoptera borealis)*	Endangered
Sperm whale *(Physeter macrocephalus)*	Endangered
Sea Turtles	
Green turtle *(Chelonia mydas)*	*Endangered/threatened
Hawksbill sea turtle *(Eretmochelys imbricata)*	Endangered
Kemp's ridley sea turtle *(Lepidochelys kempii)*	Endangered
Leatherback sea turtle *(Dermochelys coriacea)*	Endangered
Loggerhead sea turtle *(Caretta caretta)*	Threatened
Olive ridley sea turtle *(Lepidochelys olivacea)*	Threatened
Critical Habitat	
Northern right whale (*Eubaleana glacialis*)	Endangered
Finfish	
Smalltooth sawfish *(Pristis pectinata)*	Endangered
Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*)	**Endangered/threatened
Scalloped hammerhead shark (*Sphyrna lewini*)	***Threatened
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened
Giant manta ray (*Mobula birostris*)	Threatened

*Green sea turtles in U.S. waters are listed as threatened except for the Florida breeding population, which is listed as endangered. Due to the inability to distinguish between the populations away from the nesting beaches, green sea turtles are considered endangered wherever they occur in U.S. waters.
** Atlantic sturgeon have five distinct population segments. The population in the Gulf of Mexico is considered threatened. The other populations in the New York bight, Chesapeake Bay, Carolina, and South Atlantic are all considered endangered.
***Refers to the Central and Southwest Atlantic distinct population segment, the only population of this species that may interact with U.S. Atlantic HMS fisheries.

3.7.5 Sea Turtles

NMFS has taken several significant steps to reduce sea turtle bycatch and bycatch mortality in domestic longline fisheries, including: the required use of mitigation gear on pelagic longline vessels and handling/release guidelines and protocols (66 FR 17370); On March 30, 2001, NMFS implemented via interim final rule requirements for U.S. flagged vessels using pelagic longline gear on board to have line clippers and dipnets to remove gear on incidentally captured sea turtles (66 FR 17370); and additional gear, bait and safe handling regulations for the Atlantic pelagic longline fishery to further reduce the mortality of incidentally caught sea turtles (69 FR 40734). NMFS conducts workshops to educate longline and gillnet fishermen on all regulations and safe handling practices.

Internationally, the United States is pursuing sea turtle conservation through international, regional, and bilateral organizations such as ICCAT, the Asia Pacific Fishery Commission, and FAO Committee on Fisheries (COFI). At the 24th session of COFI held in 2001, the United States distributed a concept paper for an international technical experts meeting to evaluate existing information on turtle bycatch, to facilitate and standardize collection of data, to exchange information on research, and to identify and consider solutions to reduce turtle bycatch. COFI agreed that an international technical meeting could be useful despite the lack of agreement on the specific scope of that meeting. The United States has developed a prospectus for a technical workshop to address sea turtle bycatch in longline fisheries as a first step. Other gear-specific international workshops may be considered in the future.

A history of fishery management measures intended to address sea turtle bycatch, a summary of ESA consultation history, and a review of regulations for the pelagic longline fishery is available in the HMS SAFE Report.

As a result of increased sea turtle interactions in 2001 and 2002, NMFS reinitiated consultation for the pelagic longline fishery and completed a new BiOp on June 1, 2004. The June 2004 BiOp concluded that long-term continued operation of the Atlantic pelagic longline fishery as proposed 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 included a reasonable and prudent alternative (RPA), which was adopted and implemented within the pelagic longline fishery, and an Incidental Take Statement (ITS) for 2004-2006 and each subsequent three-year period (NMFS 2004a).

Sea turtle bycatch in the U.S. Atlantic pelagic longline fishery has decreased significantly in the last decade. From 1999 to 2003 (NMFS, 2019), the pelagic longline fleet targeting HMS interacted with an average of 772 loggerhead and 1,013 leatherback sea turtles per year, based on observed takes and total reported effort. In 2005, the fleet was estimated to have interacted with 275 loggerhead and 351 leatherback sea turtles outside of experimental fishing operations (Walsh and Garrison, 2006). In 2017, the U.S Atlantic pelagic longline fishery was estimated to have interacted with 78 loggerhead sea turtles and 292 leatherback sea turtles (Garrison, 2018, unpublished data) (Table 3.26). Distribution of interactions varies with species, but in general interactions per unit effort are higher in the high seas seaward of the Bahamian EEZ, off Georges Bank, and off the Grand Banks (Figure 3.30). The grid cell in Figure 3.30 that had the highest number of interactions per unit effort reflects 3 leatherback and 5 loggerhead interactions that occurred over 14 sets deployed (~12,091 hooks). This map was updated from the DEIS to the FEIS through the inclusion of an additional year of data (2018). In 2017, the majority of loggerhead sea turtle interactions occurred in the South Atlantic bight and Gulf of Mexico areas (NMFS, 2019). Interactions with leatherback sea turtles were highest in the mid-Atlantic bight, south Atlantic bight, and Gulf of Mexico areas

(NMFS, 2019). The total interactions for the 2013–15 Incidental Take Statement, takes the most recent and complete 3-year period, which were below the level established by the statement in the 2004 BiOp for both loggerheads and leatherbacks (Table 3.27). NMFS monitors observed interactions with sea turtles and marine mammals on a quarterly basis and reviews data for additional appropriate action, as necessary.

Table 3.27 Estimated Sea Turtle Interactions and Sea Turtle Incidental Take Levels in the U.S. Atlantic Pelagic Longline Fishery by Species in 2010–2017

Species	Total (2010–12)	2013	2014	2015	Total (2013–15)	2016	2017	Total (2016–17)	*Total 3-Year ITS Level
Leatherback	1,006	366	279	300	945	339	292	590	1,764
Loggerhead	1,463	377	247	243	867	154	78	216	1,905
Other/unidentified sea turtles	22	0	6	18	24	3	25	3	105

*Applies to all subsequent three-year Incidental Take Statement periods (e.g.; 2010–12, 2013–15, 2016–18); 2017 data are preliminary estimates.

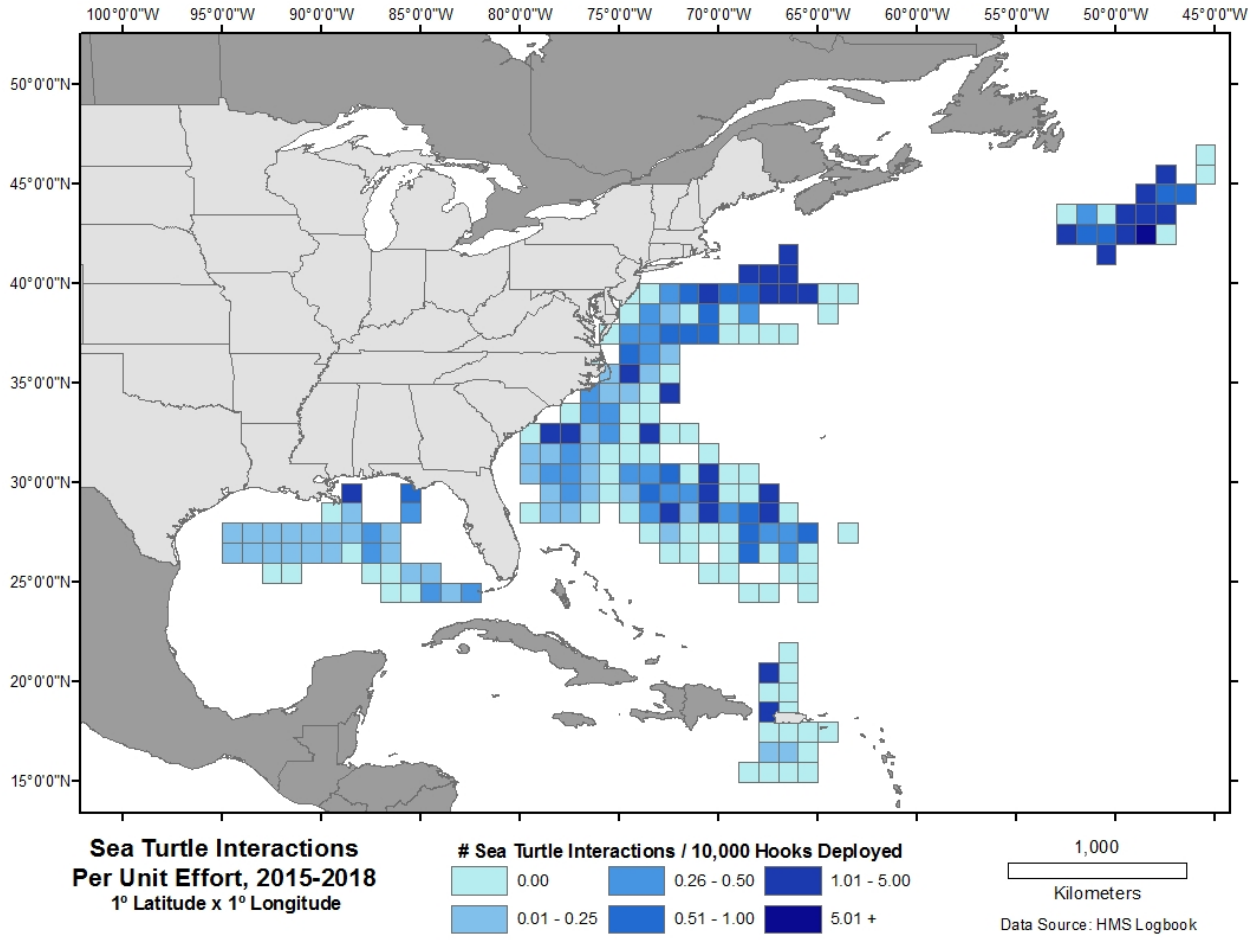

Figure 3.30 Spatial Distribution of Sea Turtle CPUE within the U.S. Pelagic Longline Fishery
Source: HMS logbook data.

3.7.6 Interactions with Seabirds

The Migratory Bird Treaty Act provides protections for all seabirds, including gannets, gulls, greater shearwaters, and storm petrels. These species are occasionally hooked by Atlantic pelagic longline gear. The majority of longline interactions with seabirds occur as the gear is being set. The birds eat the bait and become hooked on the line. The line then sinks and the birds are subsequently drowned.

The NPOA-Seabirds was released in February 2001, and calls for detailed assessments of longline fisheries, and, if a problem is found to exist within a longline fishery, for measures to reduce seabird bycatch within two years. Because interactions appear to be relatively low in Atlantic HMS fisheries, such measures have not been necessary. The 2014 Report on the Implementation of the United States National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries was submitted to the UN FAO in June 2014.

Observer data indicate that seabird bycatch is low in the U.S. Atlantic pelagic longline fishery (NMFS 2018). In 2017, there were 89 active U.S. pelagic longline vessels in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea that reportedly set approximately 5.3 million hooks. Seven seabirds were observed taken (two unidentified shearwaters, two herring gulls, one northern gannet, one northern fulmar, and one unidentified seabird). Five seabirds were released dead and two seabirds were released alive.

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4 Environmental and Economic Consequences of Alternatives

The purpose of this chapter is to analyze the potential effects of the alternatives described in Chapter 2. It analyzes and considers the direct, indirect, and cumulative environmental impacts of the alternatives. Both adverse and beneficial effects are analyzed. The chapter focuses on the ecological and socioeconomic impacts of the alternatives on the environment, including the effects on bluefin tuna, other Atlantic HMS, and non-HMS species such as dolphin fish; restricted and protected species; and EFH. Separate impact analyses were completed for each alternative, except for the anticipated impacts on EFH, which are presented as a single analysis for all of the alternatives due to anticipated low impact across all of the alternatives and little change in the types of impacts across different habitats.

For quota-managed stocks, including western Atlantic bluefin tuna and North Atlantic swordfish, the actions considered and analyzed in this FEIS would not affect or alter the science-based quotas for the stocks. Any action considered in the alternatives would manage stocks within these already-established allowable catch levels. For these stocks, NMFS previously implemented the quotas through rulemaking with the appropriate environmental analyses of the effects of quota implementation (see section 3.1.1). Where changes in amounts of interactions would occur as a result of an alternative (e.g., increases in target catch in the pelagic longline fishery in Alternative A4 for yellowfin tuna), any such increases would be within the previously-analyzed quotas or catch levels. The extent and effect of any such changes is discussed and analyzed for the relevant alternatives below.

NMFS has available a variety of sources of commercial fisheries data. This action focuses on area-based measures, whether related to fishing vessel access or gear requirements. Given that the action addresses discrete geographical area designations and gear configuration within certain areas, rather than, for example, the amount of allowable catch for a stock or estimates of stock abundance for a stock assessment, the most relevant data sources for this action are fishery-dependent data that reflect the needed geographic and other data for the area-based analyses. Atlantic HMS Logbook Data is required, self-reported data that includes landings, discards, gear, location, and other set and trip information. All pelagic longline fishermen with Atlantic HMS permits are required to use this logbook. There are also a few HMS fishermen who use other gear types (e.g., greenstick, bottom longline, and rod and reel) who also report in this logbook. This data provides specific latitude/longitude coordinates for fishing gear sets and encompasses all of the reported fishery dependent interactions of HMS-permitted participants in the pelagic longline fishery. In addition to the actual logbook forms, which include a set form, a trip form, and an economic information form, fishermen who use this logbook are also required to submit "weigh-out slips" when they submit the logbooks. Weigh-out slips are provided to the fishermen by the dealers and are not required to meet a specific format, but do include the tally and weight of each individual fish from a given trip. With the implementation of Amendment 7, several additional reporting and monitoring requirements, which are described below, have been placed on the pelagic longline fishery (e.g., EM, bluefin tuna landings and dead discard data submitted via the online IBQ System, bluefin tuna set reports submitted via VMS). Because the need for action focuses on the HMS pelagic longline fishery, because all HMS pelagic longline fishermen are required to report in this logbook,

because the data can be cross-validated with other data sources, and because the data provides location and other fishing variables required for the various analyses, NMFS used the HMS logbook as the primary data source for the analysis of this rulemaking in both the ecological and socioeconomic sections to determine the effects on catch of target species and protected/restricted species interactions, after considering all of the available data and data sources. NMFS also used some Atlantic HMS electronic dealer data for the socioeconomic calculations. Logbook data from the pelagic longline fishery were used to reflect levels of landings and discards (alive or dead), as specified in each table and accompanying analyses, of select species, including bluefin tuna, target HMS (swordfish and yellowfin and bigeye tunas), other marketable species such as dolphin fish, restricted HMS species (e.g., white and blue marlin, roundscale spearfish, sailfish, dusky sharks, and shortfin mako); and interactions with protected species.

Some additional considerations for the analyses include:

- NMFS analyzed ecological impacts on species reported in the HMS logbook by reviewing and projecting levels of landings and discards or fishing mortality of species (as specified in each table and accompanying analyses) under different scenarios, with the assumption that levels that are substantially higher than those in recent years could have adverse stock implications, especially if catches exceed the already-established quotas or are otherwise deemed contrary to conservation and management objectives. Catches or fishing mortality that is much lower than in recent years could have beneficial stock implications, if fishing pressure on those stocks is lessened and, consequentially, there are more individuals available to grow to maturity and produce the next generational cohort. Projected catches or fishing mortality that are slightly higher or lower than those in recent years, could have minor adverse or beneficial ecological impacts. For example, a minor beneficial impact to the stock could result from a management option that might benefit large individuals of different species (e.g., some of the weak hook options) which are presumably more fecund than smaller individuals. A minor adverse impact could result where there is an increase in harvest that is still within the allowable catch limits established for that stock and would likely not result in adverse stock impacts that could, for example, cause a stock to become overfished. Projected catches or fishing mortality that do not vary from the range expected to occur under a No Action alternative (i.e., status quo) generally are anticipated to continue to have the same type of impact absent other changes in circumstances. Unless otherwise stated, status quo levels of catch and fishing mortality could be considered a neutral impact, which would likely maintain the current stock status and not contribute to the stock becoming overfished or other negative effects.

- NEPA guidance specifies that the amount of data and analyses included must be commensurate with the context and intensity of the impact and to provide support for any conclusions drawn. The Atlantic HMS species in this analysis were included due to relevant nature to the rulemaking (bluefin tuna) or as target species in the pelagic longline fishery (swordfish, yellowfin and bigeye tunas, and dolphin fish). Other species were analyzed given factors such as the degree of public interest and/or legal requirements related to bycatch (billfish, sharks), substantial results in data analyses (white marlin), or public feedback received during the scoping process (white marlin, sharks). Other species (e.g. skipjack and albacore tunas) data are available in the Atlantic HMS logbook but the ability to conduct analyses are limited by a lack of data points to complete spatial analysis, are not an important component of pelagic longline interactions, or there is no data that indicates an expected impact by the alternatives analyzed in this FEIS.

- The protected species analyses were focused on certain species for different reasons primarily related to the potential for effects, and also including but not limited to their prevalence in the data; existing regulations that prohibit the retention of some species by pelagic longline fisheries (e.g., oceanic whitetip); a high degree of public interest; stock status; or the need to ensure that proposed management measures would not conflict with management requirements under the Magnuson-Stevens Act, ESA, MMPA, ICCAT recommendations, or other applicable laws. Other data are available but are limited by a lack of data points to complete spatial analysis or a species specific level of detail.

- The retention of white marlin, blue marlin, sailfish, and dusky sharks are prohibited onboard pelagic longline vessels, and sea turtles are ESA-listed species. While other species are also prohibited (e.g., oceanic whitetip are prohibited from PLL retention and night sharks are prohibited more generally within the prohibited shark complex) or listed, the effects analyses focus on these species because of the factors considered above or because only negligible impacts would be expected for such other species under the alternatives being analyzed.

- As of 2018, the retention of shortfin mako sharks is only allowed if the sharks are dead at haulback and other conditions are met. NMFS implemented rulemaking to this effect, first through an emergency rulemaking and then through an FMP amendment. Data collected before publication of the interim final rule (83 FR 8946; March 2, 2018) and subsequent final Amendment 11 to the 2006 Consolidated HMS FMP (84 FR 5358; February 21, 2019) were analyzed for this rule, as well as some data from 2018 following publication of the interim rule. The data likely reflect more mortality than what is expected to occur in data following implementation of Amendment 11.

- Roundscale spearfish was not included in analyses for the Cape Hatteras Gear Restricted Area due to lack of interactions during the effective period. Statistical analyses for weak hook research cited extensively in discussion of Alternatives D1 through D3 were completed by Southeast Fisheries Science Center staff on species that were caught in high enough numbers to support robust statistical analyses. White marlin and roundscale spearfish data were combined because it can be difficult to differentiate between these species.

NMFS used data from 2015 through 2018 to analyze potential ecological impacts of the alternatives on the specified Atlantic HMS and protected species. These years were chosen because they follow the January 2015 initial effective date of Amendment 7, which was the most recent major bluefin tuna and pelagic longline fishery management action. Management measures implemented under Amendment 7 significantly changed the management structure for the pelagic longline fishery. Extending the time series for ecological impacts assessment further back in time to include additional years would encompass fishing effort that occurred under different regulations, making the analyses less representative of the existing regulatory environment. Older data relevant to the initial implementation of spatial management measures for the Northeastern United States Closed Area and the Gulf of Mexico and Cape Hatteras gear restricted areas are summarized to provide a point of reference.

4.1 Northeastern United States Closed Area

The Northeastern United States Closed Area was implemented in 1999 for the purpose of reducing bluefin tuna dead discards across the pelagic longline fleet. Recently, there have been indications that the Closed Area may not be needed to appropriately reduce bluefin interactions by the pelagic longline fleet, given other management measures in place that serve that purpose.

In this document, NMFS analyzes several alternatives to evaluate whether the Northeastern United States Closed Area measures are still necessary to reduce and/or maintain low numbers of pelagic longline bluefin tuna discards and interactions. The alternatives, which are listed below, range from maintaining the status quo under the No Action alternative to eliminating the closure. Where appropriate, data tables and discussion have been updated to include an additional year of HMS logbook data (2018). Figures and tables with this additional year of data will indicate the new data as part of a date range (i.e., 2015 – 2018 instead of 2015 – 2017).

During the analysis of the DEIS there was a calculation error associated with revenue estimates for the Northeastern United States Closed Area. The revenue calculations for all the alternatives related to the Northeastern United States Closed Area inadvertently omitted the prices for each of the target species (resulting in a default value of $1 per pound). This error resulted in the underestimate of revenue for these alternatives. Irrespective of the calculation error, the estimated change in revenue associated with the proposed alternatives presented in the FEIS falls within a similar range to those presented in the DEIS, when compared to the no action alternative. The analysis in Table 4.11 does show a slight increase in the high range of revenue over the no action alternative but this increase is also due in part to the inclusion of 2018 HMS logbook data. The revenue calculations for the Gulf of Mexico alternatives did not experience this error in the DEIS.

During the public comment periods on stages of this rulemaking and prior to this rulemaking, NMFS heard from fishermen in the pelagic longline fishery that bluefin tuna concentrations may have shifted away from the Northeastern United States Closed Area, and, as a result, fishing effort outside the Northeastern United States Closed Area is now occurring in areas with higher bluefin tuna concentrations. NMFS analyzed data related to this issue. The data regarding higher rates of bluefin tuna landings and discards (alive and dead) occurring to the northeast of the closure in June is reflected in Figure 3.16

During scoping for this rulemaking, NMFS received public comment supporting removal of the closure, making it smaller, and/or allowing pelagic longline fishermen into the area during June provided that landings and dead discards do not meet a designated threshold. NMFS also received comments that were opposed to removing the restrictions in the area, and commenters also stated that data collection should occur before eliminating the areas. NMFS received a range of comments during the proposed rule comment period both in support of and opposed to the preferred alternative in the DEIS. As described below, after consideration of those comments, NMFS selected the same alternative (Alternative A4) as the preferred alternative in this final EIS.

Alternative A1: No Action. This area would remain closed to all vessels using pelagic longline gear onboard from June 1 through June 30 of a given year.

Alternative A2: Modify the current Northeastern United States Closed Area to remove a western portion of the closure.

Alternative A3: Apply individual performance based access to the Northeastern United States Closed Area.

Alternative A4: Undertake a review process to evaluate the continued need for Evaluation of the Northeastern United States Pelagic Longline Closure (Preferred Alternative)

Alternative A5: Eliminate the Northeastern United States Closed Area.

4.1.1 Alternative A1: No Action. Maintain the Northeastern United States Closed Area regulations.

This alternative would maintain the Northeastern United States Closed Area as it is currently defined, and the current regulations at § 635.21(c)(2)(i). The currently defined area would remain closed to all vessels using pelagic longline gear onboard from June 1 through June 30 of a given year.

Ecological Impacts on Bluefin Tuna and Target Species

As described above, this alternative would not allow pelagic longline fishing to occur during June in the Northeastern United States Closed Area. Any potential positive ecological benefits occurring from the absence of fishing in the area would continue to occur.

This area was implemented to reduce dead discards of bluefin tuna in the pelagic longline fishery. and not to lessen other environmental impacts, however. The restrictions in this area may no longer be necessary in conjunction with the IBQ Program and other measures in place to address bluefin tuna bycatch in the pelagic longline fishery. Previously-established, science-based limits on bluefin quota would continue to be adhered to and would not be affected by this alternative or any of the alternatives under consideration, as all of the alternatives only affect the time, place, and manner of catch and not the overall amount of allowable catch.

This alternative would not allow for any fishery-dependent data collection during the course of normal fishing operations from the area to evaluate the necessity of the Closed Area. The Northeastern United States Closed Area has been closed since 1999, and current information about catch rates during normal fishing operations within the area is not available. To properly analyze potential impacts of the alternatives, NMFS needed to devise a way to analyze the impacts of these alternatives, since some of the alternatives anticipate allowing some level of fishing within the Area. NMFS felt that using recent, fishery-wide data or average data from the entire area in which the pelagic longline fishery operates would not accurately reflect the potential impacts of opening a discrete geographic area to fishing because pelagic longline trends can vary widely by region. Instead, NMFS looked for a discrete geographic area within the open area that would most accurately help approximate conditions within the Closed Area. NMFS determined an appropriate "reference area" surrounding the Northeastern United States Closed Area (see Figure 4.1 under Section 4.1.2). This area was selected because NMFS determined that it would be the most relevant spatially and temporally (2015 through 2018) to help describe the ecological and socioeconomic impacts that could be anticipated within the Closed Area.

Under Alternative A1, the reference area is used to provide baseline information about catch levels that have recently occurred in the immediate vicinity of the Northeastern United States Closed Area. Under Alternatives A2 through A4, the reference area is used in data analysis to estimate catch-per-unit effort and compare potential impacts of different alternatives in the Closed Area because no fishery-dependent data collected during the course of normal fishing operations is available from within its boundaries.

Recent landings and discards (2015 through 2018) of bluefin tuna and target species (swordfish, yellowfin and bigeye tunas, and dolphin) in the reference area during the month of June are anticipated to continue in future years under this alternative (i.e., neutral impacts or no effect) (Table 4.1; updated from DEIS to include an additional year of data (2018)). This alternative would maintain recent catch levels and no fishery-dependent data from within the Northeastern United

States Closed Area in June, resulting in neutral direct ecological impacts to bluefin tuna and target species in the short- and long-term.

Table 4.1 Pelagic Longline Landings and Discards of Bluefin and Target Species in the Open Reference Area During the Effective Period of the Northeastern U.S. Closed Area (June, 2015–2018)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
Average annual amount from open reference area in June	256	31	48	20	208	4	119	6	336

Ecological Impacts on Selected Restricted and Protected Species

Discards of white marlin, blue marlin, sailfish, and dusky sharks, as well as shortfin mako shark and sea turtle interactions, in the reference area during the time period of the Northeastern United States Closed Area (June) are shown in Table 4.2 for 2015 through 2018 (updated from DEIS to include an additional year of data (2018)). All dispositions (i.e. kept and discarded dead and alive) of shortfin mako sharks were tallied together, since the vast majority of interactions will result in discards following the implementation of Amendment 11, which requires the release of any shortfin mako sharks that are alive at haulback, and given that the majority of shortfin mako sharks are alive at haulback. Under this alternative recent catch levels would be maintained and no fishery dependent data would be gathered from within the Northeastern United States Closed Area in June, resulting in neutral indirect ecological impacts to restricted and protected species in the short- and long-term.

Table 4.2 Pelagic Longline Discards of Restricted and Protected Species in the Open Reference Area during the Effective Period of the Northeastern U.S. Closed Area (June, 2015–2018)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark Interactions	Dusky Shark Discards	Sea Turtle Interactions
Average annual amount from Open Reference Area in June	8	22	5	0	88	4	17

Socioeconomic Impacts

Revenue for bluefin tuna and target species in the reference area during June are shown in Table 4.3 for 2015 through 2018 (updated from DEIS to include an additional year of data (2018)). Average annual revenue for bluefin tuna and target species combined during this time period was $178,847. The no action alternative would maintain the recent landings levels and corresponding revenues in the reference area. Also, fishery-dependent data collection would not occur during the course of normal fishing operations within the Northeastern United States Closed Area in June

because the area would remain closed to pelagic longline fishing. Therefore, this alternative would result in neutral direct and indirect socioeconomic impacts in the short- and long-term.

Table 4.3 Pelagic Longline Revenue for Bluefin and Target Species in the Open Reference Area During the Effective Period of the Northeastern U.S. Closed Area (June, 2015–2018)

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept	Total Target Species
Average annual revenue	$79,147	$48,881	$17,936	$19,990	$12,893	$178,847

Conclusion

While this alternative would meet the objective to continue minimizing bycatch and bycatch mortality of bluefin tuna through continued restrictions on fishing effort in this area during the month of June, there is uncertainty due to lack of data from within the Closed Area regarding whether this Closed Area is redundant, still appropriately located, or if it still meets its original objectives. Furthermore, given the extensive actions taken in Amendment 7, including the current IBQ Program effectively placing limits on bluefin tuna mortality on an individual vessel basis, the actions in this alternative may not be necessary to appropriately limit bluefin tuna bycatch in the pelagic longline fishery. Not all of the regulations currently in place appear to be needed to appropriately limit incidental catch of bluefin tuna in the pelagic longline fishery, and maintaining all of the restrictions may unnecessarily restrict pelagic longline fishery effort and create unnecessary regulatory burden for fishery participants. Additionally, this alternative does not meet the objective of simplifying and streamlining Atlantic HMS management and would not further the objective of improving the ability to fish available target species quotas. For these reasons, this alternative is not preferred at this time.

4.1.2 Alternative A2 Modify the current Northeastern United States Closed Area to remove a western portion of the closure.

Alternative A2 would modify the current Northeastern United States Closed Area by removing a portion of the Closed Area west of 70°W longitude, thus leaving that specific area open to pelagic longline fishing when the other section of the closed area remains closed in June.

Compared to the area east of 70º W longitude, the area west of 70°W longitude that is considered for opening in this alternative did not historically have high numbers of bluefin tuna discards reported in the HMS logbook during the time period of data originally analyzed for implementation of the closure in the 1999 HMS FMP (64 FR 29090; May 28, 1999). Figure 4.1 shows percent volume contours of bluefin tuna interactions from June in 1996 and 1997 within the boundaries of the Northeastern United States Closed Area, which was the timeframe of data considered when the area was originally closed in 1999. Each contour encompasses the respective percentage of total bluefin tuna interactions occurring within the area, for example the red contour surrounds 50 percent of the total bluefin tuna interactions. Percent volume contours were calculated using the kernel density estimation and isopleth tools in Geospatial Modeling Environment, and displayed for mapping in ArcGIS 10.3. Recent catch levels of bluefin tuna have been low in the open areas adjacent to the western portion of the Northeastern United States Closed Area, which would be opened under this alternative compared to areas surrounding the area that would remain closed. NMFS anticipates that the areas immediately adjacent to the eastern portion of the Closed Area, which had higher bluefin tuna interactions than the areas adjacent to west of 70°W longitude if the

Northeastern United States Closed Area, are effectively closed because of the Northeast Canyons and Seamounts Marine National Monument, which includes the vast majority of productive water in this area. As described in Chapter 3 the National Monument located in this area prohibits commercial fishing, including pelagic longline gear.

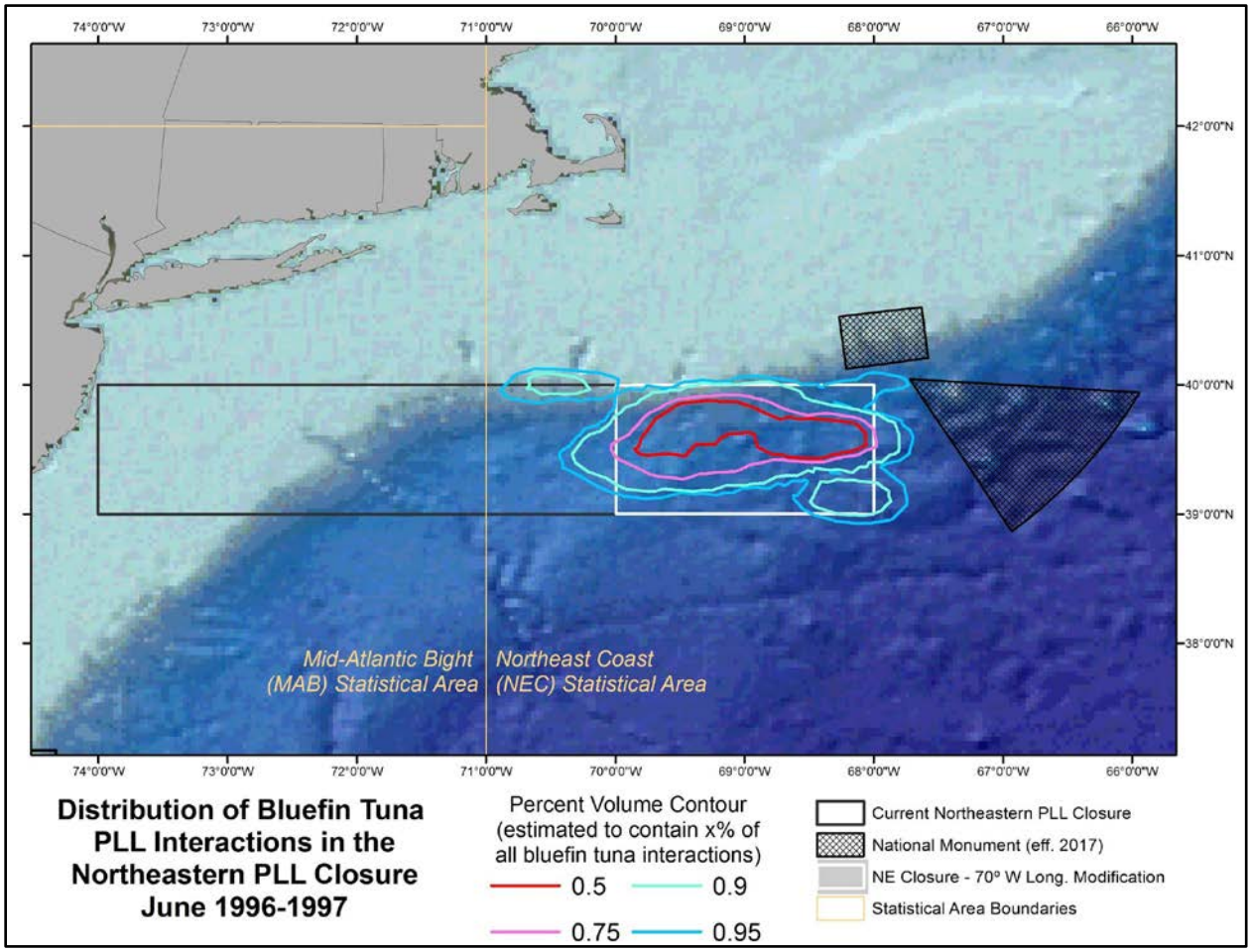

Figure 4.1 Distribution of Historical (1996–1997) Pelagic Longline Bluefin Interactions Occurring Within the Boundaries of the Northeastern U.S. Closed Area

Ecological Impacts on Bluefin Tuna and Target Species

The effort that could occur in the area, if opened by this alternative, was estimated using both historical and current effort. First, NMFS determined an appropriate reference area in the surrounding open areas of the Northeastern United States Closed Area and is the same area used to describe the impacts of taking no action (blue box, Figure 4.2). Data from this reference area was used to estimate potential impacts of this alternative in areas that have no recent data to analyze. NMFS determined that most of the current pelagic longline effort in this reference area could move into and access the area of the Northeastern United States Closed Area considered for opening in this alternative (area west of 70°W, dark green box in Figure 4.2). NMFS calculated the percent of total hooks, reported through logbooks, that were fished in the area of the Northeastern United States Closed Area considered for opening (7 percent) and area that would remain closed (93 percent) using data from the month of June from 1996 and 1997. These years of data were selected to determine the percent of total hooks because this was the time period used to evaluate ecological

impacts and determine the necessity and appropriateness of a closure in the 1999 HMS FMP. The percentage of the total hooks calculated from the historical data was then multiplied by the effort occurring in June in the reference area from 2015 through 2018 to predict the amount of effort that would be fished in the open portion of the Northeastern United States Closed Area. Both historical and current effort numbers were annualized (Table 4.4).

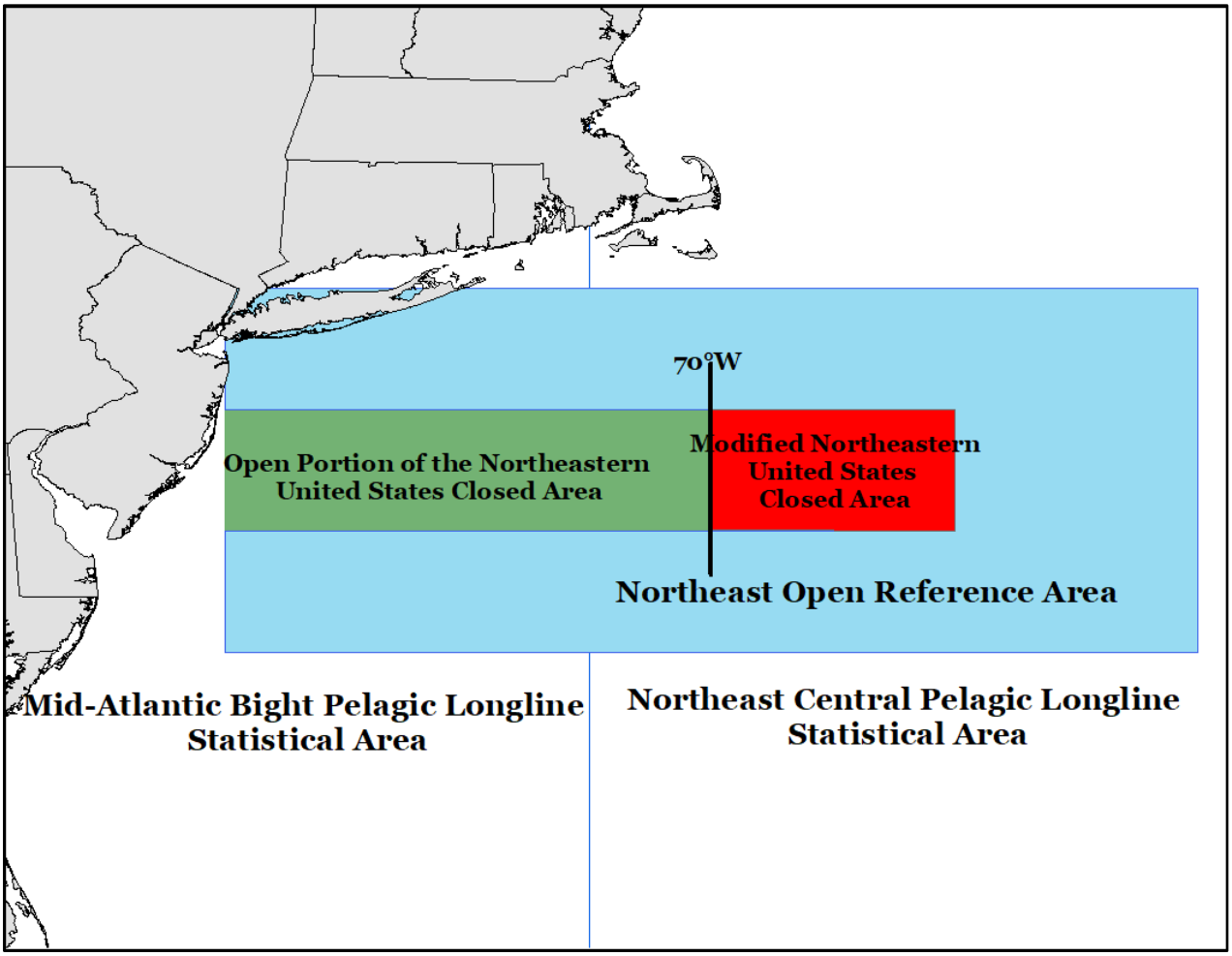

Figure 4.2 Reference Area (Blue Box); Area Considered for Opening (Green Box) in Alternative A2; Area that Could Remain Closed (Red Box)

Table 4.4 Annual Predicted Effort Calculations for the Modified Northeast U.S. Pelagic Longline Closed Area

Historical Effort in Closed Area East of 70W	Historical Effort in Portion of Closure to Remain Closed	Historical Percent of Total Hooks in the Closed Area	Current Effort in NE Open Reference Area	Expected Effort to be Fished in Area Considered for Opening
12,625 hooks	171,048 hooks	7 percent	43,206 hooks	3,024 hooks

To estimate the amount of interactions that could occur during the month of June in the area considered for opening under this alternative, NMFS used regional species-specific catch-per-unit effort from 2015 through 2018 for the month prior (May) and the month after (July) the closure to

predict catch-per-unit effort and numbers of interactions (updated from the DEIS to include an additional year of data (2018)). The catch-per-unit effort for both months provide a range of amounts of interactions that may occur during the month of June. The catch-per-unit effort for May and July were calculated from pelagic longline sets within the portion of the Northeastern United States Closed Area (i.e., the green box in Figure 4.2) that is being considered for opening under this alternative, which provide the best available data for the Northeastern United States Closed Area. Catch-per-unit effort for May and July were then multiplied by the predicted effort numbers for June (Table 4.5; updated from the DEIS to include an additional year of data (2018)) to estimate the range of predicted interactions that could occur in the area being considered for opening under this alternative. These catch-per-unit effort calculations were used to estimate interaction numbers that could occur in the area considered for opening because no fishing has occurred in that area since 1999. NMFS determined that historical catch-per-unit efforts in the Northeastern United States Closed Area when it was open (pre 1999) were not appropriate to estimate interactions due to numerous changes in the management of the pelagic longline fishery.

From 2015 to 2018, no fishing effort occurred during the month of May, in the area being considered for opening under this alternative; therefore, catch-per-unit effort for May was not available. With the absence of data from May, NMFS is using July as a proxy for estimates of interactions. Given that NMFS predicts, in the effort analysis above, only seven percent of the current effort would occur in the area considered for opening under this Alternative, NMFS assumed that 93 percent of the current effort would still occur in the reference area. Therefore, NMFS calculated numbers of interactions for the reference area and included those numbers to come up with the overall ecological impacts to all species considered in this analysis. These numbers were annualized for each species and shown in Table 4.5. Some effort would presumably still occur outside the area even after opening it and to estimate the total impact of Alternative A2, 93 percent of the baseline amounts (under the No Action Alternative) has been added to Table 4.5 (second to last row).

NMFS estimated the annual harvest from the area that would be opened under this alternative by multiplying the catch-per-unit effort of adjacent areas (reference area) by the estimated annual effort (3,024 hooks) and dividing by 10,000 hooks. Dividing by 10,000 was necessary since catch rates were presented on a per 10,000 hook basis.

Table 4.5 CPUE and Predicted Pelagic Longline Landing and Discard Ranges for Bluefin and Target Species for the Northeastern U.S. Closed Area (2015–2018)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
CPUE July (per 10,000 hooks)	23.9	4.7	1.2	0.3	37.5	1.1	29.5	0.3	7.6
Estimated June effort	3,024 hooks								
Predicted amounts in modified closed area (based on 7 percent of fishing effort)	7	1	1	0	11	1	9	0	2
Predicted amounts occurring in the open reference area (based on 93 percent of fishing effort)	238	29	45	19	193	4	111	6	312
Predicted total amounts from the modified closed area and open reference area (sum of two rows above)	245	28	46	19	204	5	120	6	314
Annual amounts from open reference area in June (shown from Alternative A1 for ease of comparison)	256	31	48	20	208	4	119	6	336

Alternative A2 would result in direct short- and long-term neutral ecological impacts on all target species (Table 4.2). Under this alternative, NMFS expects little change in the amount of fishing effort in the reference area on an annual basis, compared to the No Action alternative. Also, NMFS expects that the historical percentage of total hooks fished in the reference area and area considered for opening will not change substantially as a result of this alternative (Table 4.4). The amounts estimated for all target species from the area being considered for opening under this Alternative is below the level under the No Action alternative (predicted June amounts from the reference area adjacent to the closure).

The expected ecological impacts on bluefin tuna as a result of this alternative would result in direct short and long-term neutral impacts. The range of predicted catch is slightly less than the current landings and dead discards occurring in the reference area analyzed in the No Action alternative (Table 4.2). Opening the area west of 70°W longitude is anticipated to result in one additional landed bluefin tuna and one additional discard. As noted above, this portion of the closure historically (1996-1997) had low numbers of bluefin tuna and the area continues to have low CPUEs for bluefin tuna in July.

Ecological Impacts on Restricted and Protected Species

The predicted interactions for all billfish species and dusky sharks is expected to slightly increase or stay the same and would result in indirect short- and long-term neutral impacts when compared to Alternative A1, the No Action alternative (Table 4.6; updated from the DEIS to include an additional year of data (2018)). The predicted interactions with all sea turtle species and shortfin mako are expected to result in indirect short- and long term neutral to minor beneficial impacts when compared to the No Action alternative. During the implementation of the Northeastern United States Closed Area in 1999, NMFS determined that the closure would not affect the pelagic longline interaction levels of bycatch species (except bluefin tuna) based on the redistribution analysis completed in the 1999 FMP.

Table 4.6 CPUE and Predicted Pelagic Longline Landing and Discard Ranges for Restricted and Protected Species for the Northeastern U.S. Closed Area (2015–2018)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark Interactions*	Dusky Shark Discards	Sea Turtle Interactions
CPUE July (per 10,000 hooks)	0.6	8.7	1.5	0.1	3.2	0	0.8
Estimated June effort	3,024 hooks						
Predicted amounts in modified closed area (based on 7 percent of fishing effort)	0	3	0	0	1	0	0
Predicted amounts occurring in the open reference area (based on 93 percent of fishing effort)	7	20	5	0	82	4	16
Predicted total amounts from the modified closed area and open reference area (sum of two rows above)	7	23	5	0	82	4	16
Annual amounts from open reference area in June (shown from Alternative A1 for ease of comparison)	8	22	5	0	88	4	17

Socioeconomic Impacts

Table 4.7 Predicted Pelagic Longline Landings and Average Annual Revenue for Bluefin and Target Species for the Northeastern U.S. Pelagic Longline Monitoring Area in June

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept
Average annual landings in 2015–2018	256	48	208	119	336
Predicted range of landings	245	46	204	120	314
Percent change from 2015–2018 landings to predicted landings (%)	-4	-4	-2	+1	-7
Average annual revenue in 2015–2018	$79,147	$48,881	$17,936	$19,990	$12,893
Predicted range of average annual revenue	$75,746	$46,844	$17,592	$20,158	$12,048

Total average annual revenue for bluefin tuna and select target species in June of 2015 through 2018 was $178,847 (Table 4.7, sum of bottom row). The predicted total average annual revenue under this alternative would be $172,389. Under Alternative A2, revenue from most species is predicted to decrease during the month of June, particularly for bluefin tuna. Revenue from bigeye tuna, on the other hand, could increase slightly. Fishing revenue impacts for this alternative are expected to be neutral despite the predicted decrease in overall revenue. Fishermen will make decisions about where to fish in any given year depending on fish availability and will likely decide not to fish in the area considered for opening under this alternative if they discover it lowers their fishing revenue. Most revenue from bluefin tuna and target species would come from the reference area since much of the effort would still occur there.

The area considered for opening under this alternative would provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch.

An unquantified long-term socioeconomic benefit of this alternative is a reduction in trip length and associated fuel costs. The alternative would open areas for pelagic longline fishing that are closer to shore than the areas where most of the effort is currently occurring during the month of June. In addition, shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing. Shorter trip lengths can also reduce the social impacts of crew and captains being separated from their families while at sea. These benefits are likely to be small due to much of the effort still occurring in the open areas.

In the long-term, overall socioeconomic impacts are expected to range between minor beneficial to neutral based on the increased flexibility in fishing areas, potentially shorter trips and associated lower fuel costs, and thus potentially increased profits from fishing.

Conclusion

Given the low numbers of expected target catch in this proposed opened area, this alternative would not provide access to the more productive areas of the modified Northeastern United States Closed Area. Opening a portion of the Northeastern United States Closed Area would not alleviate uncertainty about whether the remaining closed area is still needed to achieve bluefin tuna bycatch management objectives. Also, this alternative does not provide an evaluative mechanism for opening the portion of the Northeastern United States Closed Area that would remain closed, does not address redundant regulations in the fishery, does not update the known data from the entire area that is over 20 years old, and this regulation may not remove potentially redundant regulations. For these reasons, NMFS is not preferring this alternative at this time.

4.1.3 Alternative A3: Apply individual performance based access to the Northeastern United States Closed Area.

This alternative would convert the Northeastern United States Closed Area to a gear restricted area (i.e., the "Northeastern United States Gear Restricted Area"), and apply performance based access using the access criteria currently used for the Cape Hatteras Gear Restricted Area (currently codified at § 635.21(c)(3) and § 635.14). The performance metrics defined at § 635.14 are: (1) level of bluefin tuna interactions/avoidance; (2) observer program participation; and (3) logbook submissions. Vessels would be evaluated against these performance metrics, evaluating their ability to avoid bluefin tuna, comply with Pelagic Observer Program requirements, and comply with HMS logbook submission requirements using the three most recent years of available data associated with a vessel. If no data are available, then NMFS would not be able to make a determination about vessel access, and such vessels would be excluded from gear restricted area access until NMFS has collected sufficient data for assessment (consistent with current operational Amendment 7 implementation procedures). Those vessels that meet the criteria for performance metrics would be allowed to fish in the closed area. This measure would be evaluated after at least three years of data have been collected to determine whether it effectively achieves the management objectives of this rulemaking.

The application of existing performance-based gear restricted area access regulations can provide an example of how this alternative could be applied for the Northeast United States Gear Restricted Area. In the analyses of gear restricted area access for 2018 - 2019 and 2019 - 2020, two to six pelagic longline vessels that fished in the reference area were excluded from the Cape Hatteras Gear Restricted Area out of a total of a total 14 and 16 vessels that fished in the reference area, respectively. Those same vessels would also be excluded from the Northeastern United States Gear Restricted Area under this alternative. Therefore, given this basis for comparison in access determinations, between 63 and 86 percent of vessels that fished in the reference area would be expected to have access to the Northeastern United States Gear Restricted Area under this alternative.

Under this alternative, the use of other authorized gear types such as buoy gear, green-stick gear, or rod and reel, would be allowed in the Northeast United States Gear Restricted Area by all pelagic longline vessels. NMFS could stop access by all pelagic longline vessels to the gear restricted area via inseason action to address issues including: (1) failure to achieve or effectively balance the objective of reducing dead discards with the objective of providing fishing opportunity; (2) bycatch of bluefin tuna or other HMS that may be inconsistent with the objectives or regulations or the 2006 Consolidated HMS FMP or ICCAT recommendations; or (3) bycatch of marine mammals or

protected species that is inconsistent with the MMPA, ESA, Pelagic Longline Take Reduction Plan (PLTRP), or relevant biological opinions.

Ecological Impacts on Bluefin Tuna and Target Species

To estimate effort that would occur in the Northeastern United States Gear Restricted Area under this alternative, both historical effort and current effort were used. As in Alternatives A1 and A2 above, NMFS determined an appropriate reference area in the surrounding open areas of the Northeastern United States Gear Restricted Area (blue box, Figure 4.3) to estimate amounts of interactions and effort in the Northeastern United States Closed Area if it were to be opened to qualified vessels based on individual performance metrics. This area was selected because NMFS determined that most of the current pelagic longline effort in the reference area could have the ability to move into and access the Northeastern United States Gear Restricted Area if it were opened under this alternative. NMFS calculated the percent of the total hooks that were fished in the area that became the Northeastern United States Closed Area (80 percent) and in the open portions of the reference area (20 percent) in June in 1996 and 1997. These years were selected because this data was used to determine and finalize the closure in the 1999 HMS FMP. The percentage of the total hooks calculated from the historical data were then multiplied by the annual effort occurring from June of 2015 through 2018 to predict the amount of effort that would be fished in the Northeastern United States Gear Restricted Area if finalized as a gear restricted area rather than a closed area and if access to the area were based on individual performance metrics. (green box, Figure 4.3). Both historical and current effort numbers were annualized (Table 4.8).

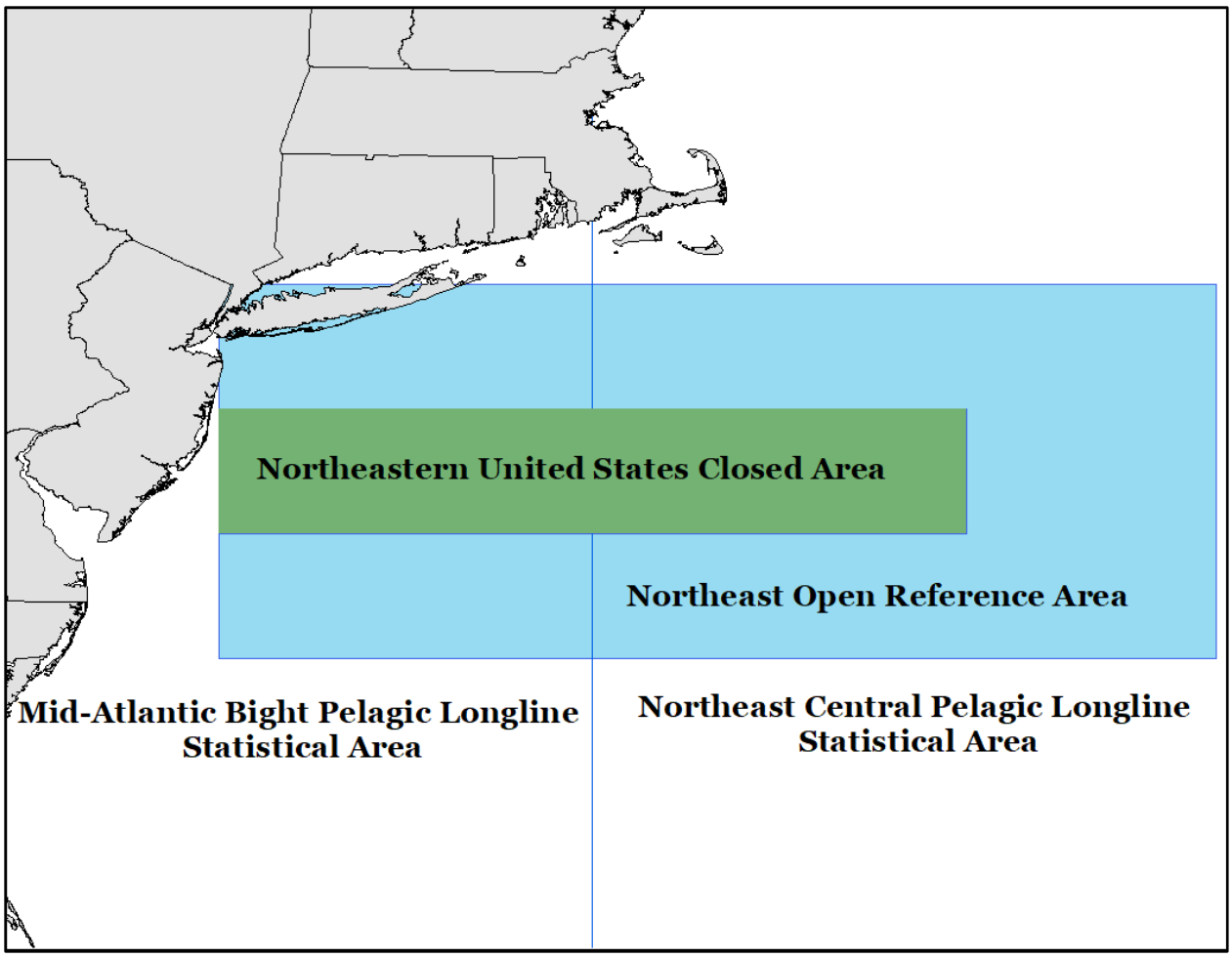

Figure 4.3 Reference Area (Blue Box) for the Northeastern United States Closed Area/Gear Restricted Area (Green Box)

Table 4.8 Annual Predicted Effort Calculations for the Northeast U.S. Pelagic Longline Gear Restricted Area (abbreviated "NE U.S. GRA") with Performance Metrics

Historical Effort in NE U.S. GRA	Historical Effort in Open Reference Area	Historical Percent of Total Hooks in the NE U.S. GRA (%)	Current Effort in NE Open Reference Area	Expected Effort to Be Fished in NE U.S. GRA
146,311 hooks	37,362 hooks	80	43,206 hooks	34,565 hooks

To estimate the amount of interactions that could occur during the month of June in the Northeastern United States Gear Restricted Area, NMFS used regional catch-per-unit efforts for the month prior (May) and the month after (July) the closure to predict catch-per-unit effort and numbers of interactions. The catch-per-unit effort for both months provide a range of catch levels that may occur during the month of June. The catch-per-unit effort for May and July were calculated from pelagic longline sets within the Northeastern United States Gear Restricted Area, which provide the best available data that area because these are the two months that straddle the period of when the area is currently closed (June). The catch-per-unit effort were then combined with the

predicted effort numbers to come up with a range of predicted amount of interactions that would occur in the gear restricted area. Given that NMFS predicted only 80 percent of the current effort would occur in the gear restricted area, NMFS assumed that 20 percent of the current effort would still occur in the reference area. Therefore, NMFS calculated numbers of individuals for the reference area and included those amounts to develop the overall ecological impacts to all species considered in this analysis. These numbers of interactions were annualized for each species and shown in Table 4.9 (updated from the DEIS to include an additional year of data (2018)). Some effort would presumably still occur outside the gear restricted area and to estimate the additional impact of Alternative 3, 20 percent of the baseline amounts (under the No Action Alternative) would be added to the predicted amounts in order to estimate the total impact Table 4.9 (second to last row).

NMFS calculated the annual number of individuals that were expected to be caught by taking the catch-per-unit effort ranges and multiplying by the predicted annual effort (34,565 hooks), and dividing that number by 10,000. Dividing by 10,000 was necessary since catch rates presented on a 'per 10,000 hook' basis.

The analysis in Table 4.9 assumes that all vessels that fished in the reference area would have access to the Northeastern United States Gear Restricted Area (i.e., given that they would be required to meet the performance criteria for access). As described above, at least 63 to 86 percent of vessels that fished in the reference area would have had access to the Cape Hatteras Gear Restricted Area in 2019, and a comparable level of access would be expected for the Northeastern United States Gear Restricted Area in the future. Although the percentage of vessels that would have access decreased for 2019-2020, the vessels that did not qualify this year may qualify in the following year. There could be a slight decrease in effort or catch within the gear restricted area from the values described here, with a corresponding increase in effort or catch in the open area, because vessels excluded from the gear restricted area would likely continue to fish in the open area, but the predicted ranges of catch still represent the best estimate for these areas.

Ecological impacts on bluefin tuna as a result of this alternative are expected to be direct, short-term, neutral or minor beneficial, as the range of catch, presented in Table 4.9 (row Predicted Range of Total Amount from the NE U.S. GRA and Open Reference Area) estimated is much lower or slightly higher (depending on the range of CPUE) than amounts under the No Action alternative (A1). Additionally, a disincentive to catching bluefin tuna would be created by this alternative because allowing performance-based access to the Northeastern United States Gear Restricted Area means any vessels that do not effectively avoid bluefin tuna would be excluded from the gear restricted area in subsequent years.

Table 4.9 CPUE Ranges and Predicted Pelagic Longline Landing and Discard Ranges for Bluefin and Target Species for the Northeastern U.S. Gear Restricted Area (2015–2018)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
CPUE range from May & July (per 10,000 hooks)	28.8–50.0	0–6.0	1.2–16.7	0–0.3	35.6–88.8	0–1.0	16.7–24.3	0-.3	0–9.3
Estimated June effort	34,565 hooks								
Predicted range of amounts in the NE U.S. GRA with performance (based on 80 percent of fishing effort)	100–173	0–21	4–58	0–1	123–307	0–3	58–84	0-1	0–32
Predicted amount occurring in the open reference areas (based on 20 percent of fishing effort)	51	6	10	4	42	1	24	14	67
Predicted range of total amounts from the NE U.S. GRA and open reference area (sum of two rows above)	151–224	6–27	14–68	4–5	165–349	1–4	82–108	14-15	67–99
Annual amounts from open reference area in June (shown from Alternative A1 for ease of comparison)	256	31	48	20	208	4	119	68	336

The ecological impacts on most target species as a result of this alternative would result in direct short-term impacts that are likely to be neutral. With performance-based access under this alternative, NMFS expects minimal change in the amount of total effort that has currently been fished in the reference areas on an annual basis. Also, NMFS does not expect that the historical percentage of total hooks fished in the open and gear restricted area will change substantially due to this alternative. The range of interactions estimated for many target species is at or below the current June interactions from the areas adjacent to the gear restricted area, with the exception of retained yellowfin tuna. The ranges of yellowfin tuna landings for Alternative A3 are above and below the landings in the no action alternative, depending on the catch per unit effort used (May or July). Should the landings increase, the magnitude of potential increases in yellowfin tuna landings would be small increasing landings by 141 fish, and is not anticipated to greatly increase the overall United States landings of yellowfin tuna. Therefore, the direct short-term ecological impacts for yellowfin tuna are likely to be neutral.

Long-term impacts on these species would depend on future trends in performance-based access to the Northeastern United States Gear Restricted Area. If the number of vessels allowed access to these areas remains consistent over time, long-term impacts would be expected to be the same as short-term impacts. If fewer vessels have access to the areas in the future, effort in these areas would be expected to decrease, and long-term impacts on bluefin tuna and target species would be expected to be incrementally more beneficial. If more vessels have access to the area, the long-term impacts on bluefin tuna and target species would be expected to be incrementally more adverse.

Ecological Impacts on Restricted and Protected Species

The methods used for estimating protected species interactions were the same as presented above for impacts to bluefin tuna and pelagic longline target species. The predicted effort is the same hook value as used above. Discards were summed for all of the billfish species and dusky sharks. All dispositions of shortfin mako sharks were tallied together since the vast majority of interactions will be discarded alive following the implementation of Amendment 11 (84 FR 5358; February 21, 2019). Also, due to low interactions with sea turtles, all sea turtle interactions were combined. The numbers of interactions were annualized for each of these restricted and protected species and shown in Table 4.10 (updated from the DEIS to include an additional year of data (2018)).

Table 4.10 CPUE Ranges and Predicted Pelagic Longline Discard Ranges for Restricted and Protected Species for the Northeastern U.S. Gear Restricted Area (2015–2018)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Interactions	Dusky Shark Discards	Sea Turtle Interactions
CPUE Range from May & July (per 10,000 hooks)	0–0.9	0–9.7	0–1.7	0–0.1	5.7–22.2	0	0–0.9
Estimated June effort	34,565 hooks						
Predicted amounts in NE U.S. GRA (based on 80 percent of fishing effort)	0–3	0–34	0–6	0–1	20–77	0	0–3
Predicted amount occurring in the open reference areas (based on 20 percent of fishing effort)	2	4	1	0	18	1	3
Predicted total amounts from the NE U.S. GRA and open reference area (sum of two rows above)	2–5	4–38	1–7	0–1	38–95	1	3–6
Annual amount from open reference area in June (shown from Alternative A1 for ease of comparison)	8	22	5	0	88	4	17

The predicted amount of roundscale spearfish, blue marlin, Atlantic sailfish, dusky sharks, and shortfin mako sharks is expected to result in indirect, short-term, minor, beneficial to neutral impacts because the predicted range of total interactions for these species is expected to be lower or only slightly higher (at maximum, NMFS estimates a total of 2 additional blue marlin and 7 additional shortfin mako) than the amount from the no action alternative (Alternative A1). The predicted interactions for all sea turtle species is expected to result in indirect, short-term, minor beneficial impacts because the number of interactions of sea turtles is expected to be substantially less than what occurs in the adjacent open areas during the month of June (17 total interactions). Therefore, indirect short-term minor beneficial impacts are expected.

The upper range for white marlin discards are predicted to be slightly higher than what the discards are in the reference areas in June (no action, Alternative A1). This is similar to the DEIS which showed the upper range of interactions could exceed the current interactions occurring in the open areas (52 interactions). The upper range of white marlin with the inclusion of 2018 data is 38 total interactions, which is still above the average of 22 interactions in the reference areas in June. Although a decrease in the high range is predicted using 2018 data, NMFS expects this alternative may result in short-term, minor, adverse impacts to the white marlin stock.

Long-term impacts on these species would depend on future trends in performance-based access to the Northeastern United States Gear Restricted Area. If the number of vessels allowed access to these areas remains consistent over time, indirect, long-term impacts would be expected to be the same as short-term impacts. As described above, this analysis assumes that all vessels that fished in the reference area would have access to the Northeastern United States Gear Restricted Area. There could be a slight decrease in effort or interactions within the Northeastern United States Gear Restricted Area from the values described here, with a corresponding increase in effort or interactions in the open area, due to vessels excluded from the gear restricted areas, but the predicted ranges of amounts still represent the best estimate for these areas.

Socioeconomic Impacts

Landings estimates presented in the Ecological Impacts on Bluefin Tuna and Target Species section were used to estimate a range of socioeconomic impacts on pelagic longline vessels. Average revenue for each species was calculated using data from the month of June in the reference area highlighted in blue in Figure 4.3. The average price was then used to present a range of impacts related to bluefin tuna and target species landings for pelagic longline vessels. This range was derived from the range of total landings including landings from the reference area. Landings numbers for bluefin tuna and target catch were used to predict the socioeconomic impacts (Table 4.11; updated from the DEIS to include an additional year of data (2018)).

Table 4.11. Predicted Pelagic Longline Landings Ranges and Average Annual Revenue Ranges for Bluefin and Target Species for the Northeastern U.S. Gear Restricted Area in June

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept
Average annual landings in 2015–2018	256	48	208	119	336
Predicted range of landings	151–224	14–68	165–349	82–108	67–99
Percent change from 2015–2018 catch to predicted landings (%)	-41 to -13	-17 to +42	-21 to +88	-31 to -9	-80 to -71
Average annual revenue in 2015–2018	$79,147	$48,881	$17,936	$19,990	$12,893
Predicted range of average annual revenue	$46,684–$69,254	$14,257–$69,248	$14,228–$33,803	$13,775–$18,142	$2,571–$3,799

Total average annual revenue for bluefin tuna and target species in June of 2015 through 2018 was $178,847 (Table 4.11). The predicted range of total average annual revenue under this alternative would be $91,515 to $194,246. Revenue from some species is predicted to decrease during the month of June, particularly for swordfish, bigeye tuna, and dolphin. Revenue from yellowfin tuna, on the other hand, could increase substantially. Fishing revenue impacts for this alternative are expected to be neutral to minor beneficial given the predicted range in overall revenue. Fishermen will make decisions about where to fish in any given year depending on fish availability and would likely decide not to fish in the Northeastern United States Gear Restricted Area if they qualify for access and discover it lowers their fishing revenue.

Implementing performance-based access would provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative would also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch.

An unquantified short-term, beneficial socioeconomic benefit of this alternative is a reduction in trip length and associated fuel cost. The Northeastern United States Gear Restricted Area would open areas for qualified pelagic longline vessels that are closer to shore than where most of the effort is currently occurring during the month of June in the adjacent open areas. The gear restricted area is approximately 320 miles wide from west to east, so allowing fishing in the area could reduce some trips by hundreds of miles. Less fuel consumption would lower the trip cost and increase the trip profit, which may influence fishermen's decisions on fishing in the Northeastern United States Gear Restricted Area under performance metrics. In addition, shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing. Shorter trip lengths can also reduce the social impacts of crew and captains being separated from their families while at sea.

In the short-term, overall socioeconomic impacts are expected to range between minor positive to neutral based on the increased flexibility in fishing areas, potentially shorter trips and associated lower fuel costs, and thus potentially increased profits from fishing. There could be a slight

decrease in revenues in the long-term within the Northeastern United States Gear Restricted Area from the values described here, with a corresponding increase in revenues in the open area, due to vessels excluded from the gear restricted area, but the predicted ranges of interactions still represent the best estimate for socioeconomic impacts.

Conclusion

As described above, the majority of vessels fishing in the reference area would be expected to have access to the Northeastern United States Gear Restricted Area under this alternative, which minimizes any benefit to applying performance based access. Although this alternative would allow access to most pelagic longline vessels in the short-term, over time if fewer vessels are qualified for access to the area it could reduce the amount of data collection from the area. There is also some question as to the ability of this alternative to incentivize fleet-wide reductions in bluefin tuna interactions, especially if vessels are fishing elsewhere or under separate regulations (i.e. the NED). This alternative does not present much difference in ecological or socioeconomic impacts from opening this area as a Monitoring Area (Alternative A4) or eliminating the Closed Area (Alternative A5). This alternative may not meet the objectives of optimizing the ability of the pelagic longline fleet to harvest target species, since this alternative may limit pelagic longline vessel access. For this reason, NMFS does not prefer this alternative at this time.

4.1.4 Alternative A4: Undertake a review process to evaluate the continued need for the Northeastern United States Closed Area (Preferred Alternative)

This alternative would convert the "Northeastern United States Closed Area" to a monitoring area called the "Northeastern United States Pelagic Longline Monitoring Area" and establish a three-year evaluation period during which fishing would be allowed in the Monitoring Area. Fishing activity would be closely monitored by NMFS under a four-step process (Figure 4.4) that would prohibit fishing if the fleet had to use more than a specified threshold amount of IBQ allocation to account for bluefin landings or dead discards in the Monitoring Area. The Monitoring Area would be managed as follows:

—The Monitoring Area would initially remain open to pelagic longline fishing from June 1 to June 30 (Step 1, Figure 4.4).

—There would be an annual 150,519 pound IBQ allocation threshold for landings and dead discards of bluefin caught within the Monitoring Area.

—If the threshold is reached, or is projected to be reached, NMFS would file a closure notice for the Monitoring Area with the Office of the Federal Register (Step 2, Figure 4.4).

—On and after the effective date of the notice, the Monitoring Area would be closed to pelagic longline fishing each year from June 1 through June 30, unless NMFS takes further action.

—If no closure notice is filed between June 1, 2020 and December 31, 2022, the Monitoring Area would remain open (Step 2, Figure 4.4), unless and until NMFS decides to take additional action. The area would be closely monitored by NMFS under a process that would prohibit fishing if the fleet were to use IBQ allocation in exceedance of an established annual threshold to account for bluefin landings or dead discards caught within the boundaries of the Monitoring Area. The 150,519 lb threshold is based on the average annual amount of unused Atlantic IBQ allocation that was available for use by the pelagic longline fleet from June 1 through December 31 (from 2015

through 2018). The 150,519 lb threshold is approximately 72 percent of the adjusted total Atlantic IBQ allocation currently distributed to the fleet. In the event that the western Atlantic bluefin tuna quota later is reduced at ICCAT and the U.S. allocation of bluefin quota is adjusted downward as a result, the threshold would also be adjusted. Such adjustment would make the threshold 72percent of the total Atlantic IBQ allocation disbursed to the fleet as a result of the lower U.S allocation. If the ICCAT quota were to increase and the United States' allocation increased as well, adjustments would not be made to increase the threshold for several reasons. The current threshold balances the need to limit bycatch of bluefin tuna in the pelagic longline fishery with providing fishing opportunity for pelagic longline vessels to harvest available target quotas. NMFS received comments from the public expressing concern about increases in the amount of mortality that could occur under any change to the status quo, encouraging the agency not to undertake actions that could increase mortality of bluefin tuna. Because the area has been closed, there is uncertainty concerning the ecological impacts of allowing pelagic longline fishing in this area. Based on data available from 2015-2018, NMFS identified a conservative threshold which provides a substantial buffer of IBQ allocation to account for bluefin landings and dead discards in the event of disaster sets under known levels of fishing effort. By not adjusting upwards, NMFS is ensuring that the amount of mortality is limited to a level that is comparable to what could have reasonably occurred between 2015 and 2018 to minimize risk and address all rulemaking objectives and public concern.

Using unused allocation as the threshold helps to ensure that opening the area to fishing would not compromise adherence to the overall bluefin quota or the ability of fishery participants to obtain enough IBQ allocation to cover bluefin landings and dead discards for the rest of the year (e.g. January - May). It should be noted that the threshold does not mean that 150,519 lb of IBQ allocation can be used only in the Monitoring Area. IBQ allocation is still subject to the same regulations previously applicable. The threshold is for NMFS' monitoring and evaluation purposes for the Area only. After the 2020-2022 evaluation period, NMFS will evaluate data collected from the Monitoring Area and compile a report (Step 3, Figure 4.4). Based on the findings of the report, NMFS may then decide to initiate a follow-up action to implement new, longer-term management measures for the area (Step 4, Figure 4.4).

Under this alternative NMFS would establish a threshold of 150,519 pounds of IBQ allocation that could be used to account for landings and dead discards of bluefin caught within the boundaries of the Monitoring Area for the month of June each year. This threshold amount was calculated based on the average amount of IBQ allocation that has been available but unused for the past four years in the Atlantic region from June 1 through December 31 (Figure 4.5, Table 4.12). This threshold would ensure that opening the area to fishing would not compromise the ability of fishery participants to obtain enough IBQ allocation to account for bluefin landings and dead discards for the rest of the year Atlantic-wide. The average annual amount of IBQ allocation used by pelagic longline vessels from January through the end of May over the past four years (2015-2018) is shown in Table 4.12, along with the amount of allocated quota remaining for use from June through the end of December.

The predicted effort that would occur in the Monitoring Area was estimated using both historical and current effort. As described in alternatives A1-A3 above, NMFS determined an appropriate reference area in the surrounding open areas of the Northeastern United States Closed Area (e.g., Figure 4.2, Figure 4.3). The analysis and impacts for bluefin tuna and target species as described in Alternative A3 would be the same for this alternative (see Table 4.8 and Table 4.9). Similarly, the methods used for estimating protected species interactions were the same as presented above in Alternative A3. The analysis and impacts for protected and restricted species as described in

Alternative A3 would be the same for this alternative (Table 4.10). Socioeconomic impacts are also anticipated to be the same as Alternative A3 (Table 4.11).

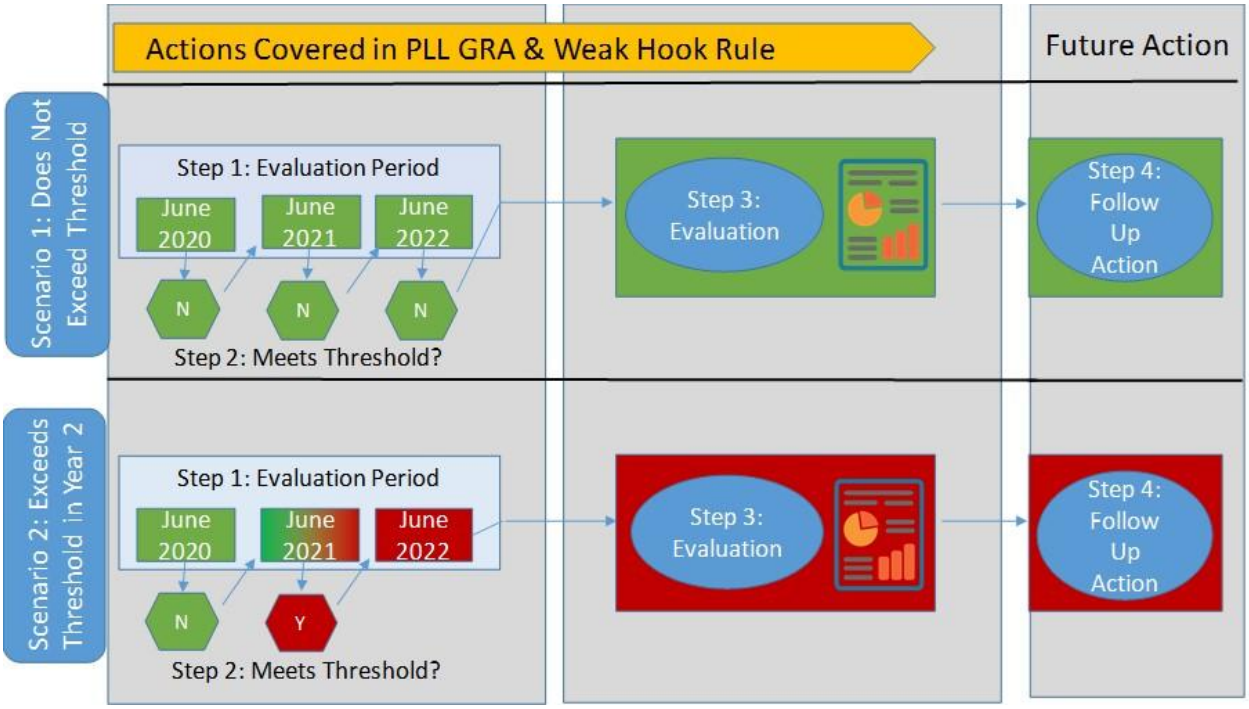

Figure 4.4 Flowchart of the Evaluation Process for the Northeastern United States Pelagic Longline Monitoring Area

Green indicates the monitoring area is open to fishing; red indicates the monitoring area is closed to fishing; gradient green to red indicates an inseason action closed the monitoring area to fishing).

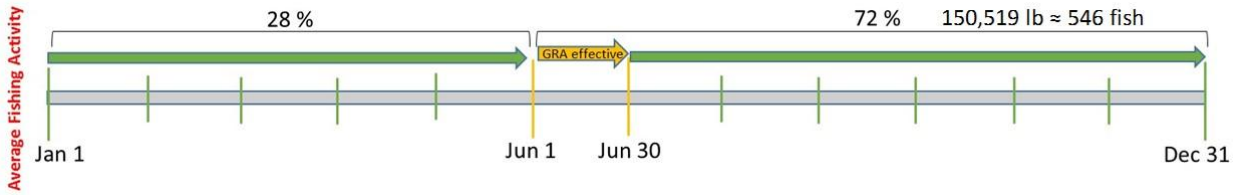

Figure 4.5 Average IBQ Use By the Pelagic Longline Fishery in the Atlantic Region and the Corresponding Threshold for the Northeastern United States Pelagic Longline Monitoring Area

Table 4.12 IBQ Usage in the Atlantic Pelagic Longline Fishery (2015–2018)

Year	Atlantic IBQ Usage (January–May)	Atlantic Quota	Net Atlantic Quota (June–December)	Percent Used in Atlantic (January-May)	Percent Remaining in Atlantic (June-December)
2015	35,449	196,749	161,300	18	82
2016	58,237	212,512	154,275	27	73
2017	48,892	212,512	163,620	23	77
2018	89,629	212,512	122,883	42	58
Average	58,052	208,571	150,519	28	72

Ecological Impacts on Bluefin Tuna and Target Species

As was found for Alternative A3, short-term ecological impacts on bluefin tuna as a result of this alternative are expected to result in overall direct, neutral or minor beneficial impacts. For all target species the short-term ecological impacts would be direct and neutral (Table 4.9). Decreases in catch are expected for some species, which would result in minor beneficial impacts for those species. The increases in yellowfin tuna catch are expected to be neutral for the same reasons as explained in the discussion for Alternative A3.

Long-term impacts on these target species would depend on whether the area remains open or closed at the end of the result of the three-year Evaluation Period for this Monitoring Area (Table 4.9). If this area remains open after the Evaluation Period, long-term impacts would be expected to be the same as short-term impacts (i.e., neutral or minor beneficial). If the area is closed after the Evaluation Period, NMFS anticipates that long-term ecological impacts would be comparable to the No Action alternative (i.e., neutral).

Ecological Impacts on Restricted and Protected Species

The predicted interactions of blue marlin, Atlantic sailfish, dusky sharks, and shortfin mako sharks is expected to result in indirect, short-term, minor, beneficial to neutral impacts (Table 4.10). The impacts for all sea turtle species is expected to be indirect, short-term, minor, beneficial. White marlin interactions would result in indirect, short-term, minor, adverse impacts to the stock. During the development of the evaluation report at the end of the three-year period, a comprehensive analysis of bycatch will be completed and NMFS could take further action, after the three-year evaluation.

Long-term impacts on these species would depend on the result of the three-year evaluation period for this Monitoring Area. If these areas remain open after three years, long-term impacts would be expected to be the same as short-term impacts. If the area is closed after the evaluation period, NMFS anticipates that long-term ecological impacts would be comparable to the No Action alternative (i.e., neutral).

Socioeconomic Impacts

As with the ecological impacts, the socioeconomic impacts are expected to be the same as Alternative A3 and in the short-term, ranging between minor beneficial to neutral (Table 4.11). Although extremely unlikely, some pelagic longline fishermen could use all of their IBQ allocation early in the year limiting their ability to fish for the rest of the year. Long-term socioeconomic impacts would depend on the result of the three-year evaluation period for this Monitoring Area. If the area remains open after three years, long-term impacts would be expected to be the same as short-term impacts. If the area is closed after the evaluation period, NMFS anticipates that long-term economic impacts would be comparable to the No Action alternative (i.e., neutral).

Conclusion

This alternative is consistent with the objectives of optimizing the ability of the pelagic longline fleet to harvest target species, because it provides a carefully controlled mechanism to allow fishermen back into areas that were previously closed. This alternative also helps with the uncertainty due to lack of data from within the closed area as to whether the area is still appropriately located or needed to meet bluefin tuna management objectives. This alternative gives fishermen more flexibility to determine where to fish to optimize target catch in the region encompassing the Northeastern United States Closed Area. This alternative would also be expected to have neutral ecological impacts on bluefin tuna, as it provides measures to minimize bluefin tuna bycatch via the threshold and evaluative aspects of the program. It should allow the pelagic longline fishery vessels to continue fishing from January through May, within the same levels of IBQ allocation usage (2015-2018), and have a threshold level that provides both sufficient opportunities for fishermen to target swordfish, yellowfin tuna, bigeye tuna, as well as other pelagic species, and limits catch of bluefin tuna while the Monitoring Area is effective. The individual accountability aspects of the IBQ Program would still be relied upon to incentivize bluefin tuna avoidance, meaning that there is still a proven means to achieve the objectives of continuing to minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS. In addition, this alternative simplifies and streamlines regulations in the Atlantic intended to reduce bluefin tuna, and is therefore consistent with that corresponding objective for this rulemaking. For these reasons, this alternative is preferred at this time.

4.1.5 Alternative A5 Eliminate the Northeastern United States Closed Area.

This alternative would eliminate all restrictions currently associated with the Northeastern United States Closed Area, and open the area to fishing with pelagic longline gear during the current closed period of June 1 through June 30. This area would continue to be open for all of the other months of the year.

Ecological Impacts on Bluefin Tuna and Target Species

Since this alternative would allow access to all pelagic longline vessels by removing regulations related to the Northeastern United States Closed Area the impacts to bluefin tuna and target species

amounts would be the same as presented in Alternative A3 (Table 4.9). The short and long term impacts to bluefin tuna and target species would be the same as analyzed in Alternative A3. Therefore, ecological impacts on bluefin tuna as a result of this alternative are expected to result in direct, short and long-term, minor beneficial impacts. The ecological impacts on all target species as a result of this alternative would result in direct short and long-term impacts that are likely to be neutral. These conclusions are based on a comparison of the estimated landings and discards of these species under Alternative A5 (2nd row from the bottom) to the estimated number of landings and discards under the No Action Alternative, Alternative A1 (bottom row).

Ecological Impacts on Restricted and Protected Species

The methods used for estimating protected species interactions were the same as presented above in Alternative A3. The predicted amount of blue marlin, Atlantic sailfish, dusky sharks, and shortfin mako sharks is expected to result in indirect short-term, minor, beneficial to neutral impacts (Table 4.10). The impacts for all sea turtle species is expected to result in indirect, short-term, minor, beneficial results. White marlin interactions would result in indirect short-term minor adverse impacts to the stock. These conclusions are based on a comparison of the estimated discards or interactions of these species under Alternative A5 (2nd row from the bottom) to the estimated number of landings and discards under the No Action Alternative, Alternative A1 (bottom row).

The impacts of this alternative are expected to be the same as Alternatives A3 and A4, but this alternative would not provide a mechanism for NMFS to quickly restrict fishing if bycatch levels of any Atlantic HMS are beyond acceptable levels.

Socioeconomic Impacts

Since this alternative would allow access to all vessels by removing regulations related to the Northeastern United States Closed Area, the socioeconomic impacts would be the same as presented Alternative A3. In the long-term, overall socioeconomic impacts are expected to range between minor beneficial to neutral based on the increased flexibility in fishing areas, potentially shorter trips and associated lower fuel costs, and thus potentially increased profits from fishing (Table 4.11).

Conclusion

Elimination of the Northeastern United States Closed Area is anticipated to have similar impacts as the evaluative option (Alternative A4), and the use of performance metrics in the Northeastern United States Closed Area (Alternative A3). However, NMFS does not prefer this alternative at this time, given uncertainty with the amounts of interactions estimates in the analysis and inability to quickly restrict fishing if bycatch impacts to the bluefin tuna or other species are beyond acceptable levels. This alternative also does not provide an automatic mechanism for NMFS to initiate the review of the impacts of opening the area. This alternative does not align with the objective of adequately conserving and managing the bluefin tuna stock and minimizing bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS with the lack of NMFS ability to quickly restrict fishing if bycatch levels of any Atlantic HMS are beyond acceptable levels. This alternative is not preferred at this time.

4.2 Cape Hatteras Gear Restricted Area

In this document, NMFS analyzes alternatives to evaluate whether the Cape Hatteras Gear Restricted Area measures are still necessary to reduce and/or maintain low numbers of pelagic longline bluefin tuna interactions. Because the pelagic longline fleet is operating under the regulations associated with the IBQ Program, opening the area to pelagic longline fishing would maintain rigorous accountability for bluefin tuna bycatch while reducing redundant regulations and providing more opportunities to harvest target species (e.g., swordfish and yellowfin tuna). NMFS has selected the same alternative as "preferred" in both the DEIS and the FEIS.

Through the scoping process, pelagic longline fishermen have suggested that the Cape Hatteras Gear Restricted Area is no longer needed to limit bluefin tuna interactions given the apparent effectiveness of the IBQ Program. During scoping for this rulemaking, NMFS received comments in favor of removal of the area to allow pelagic longline fishermen into the area during December through April provided that interactions do not meet a designated threshold. NMFS also received comments that opposed removing the area, and in one case supporting an expansion of the Cape Hatteras Gear Restricted Area.

NMFS received public comment on the proposed rule and DEIS concerning the alternatives under consideration for the Cape Hatteras Gear Restricted Area. Specifically, NMFS heard both support and opposition to the preferred alternative identified in the DEIS and the proposed rule. Some commenters felt that the area was no longer needed and could be removed, while others felt that the existing measures were still effective or warranted for a variety of reasons (see Response to Comments in Appendix F).

The alternatives, which are listed below, include maintaining the status quo under the No Action alternative and eliminating the Cape Hatteras Gear Restricted Area. Where appropriate, data analyses have been updated to reflect recent data, such as 2018 HMS logbook data. This is a change from the DEIS to the FEIS. Figures and tables with this additional year of data will indicate the new data as part of a date range (i.e., 2015 – 2018 instead of 2015 – 2017).

Alternative B1: No Action. Maintain the current gear restricted area off Cape Hatteras, North Carolina, from December through April as well as the performance metrics for access to the area.

Alternative B2: Eliminate the Cape Hatteras Gear Restricted Area (Preferred Alternative)

4.2.1 Alternative B1: No Action. Maintain current gear restricted area off Cape Hatteras, North Carolina, from December through April as well as the performance metrics for access to the area

This alternative would maintain the current boundaries and restrictions associated with the Cape Hatteras Gear Restricted Area (Figure 4.6). Access to the area would continue to be based on an annual evaluation of performance metrics. Vessel data reflecting the three most recent years of available data is compiled annually from HMS logbooks and the Pelagic Observer Program. For example, vessel access for the effective period of December 1, 2019 through April 30, 2020 was determined based on data from 2016 through 2018, as HMS logbook data are generally not available for a given year until the following August due to late reporting and QA/QC processes. Vessels would be evaluated against access criteria (i.e., performance metrics) evaluating their

ability to avoid bluefin tuna, comply with Pelagic Observer Program requirements, and comply with HMS logbook submission requirements using the three most recent years of available data associated with a vessel. Vessels would be allowed to fish in the area using pelagic longline gear if they have met the access criteria. In other words, those vessels are determined by NMFS to have a relatively low rate of interactions with bluefin tuna relative to target species landings, and that they are compliant with reporting and monitoring requirements. If no data are available, then NMFS would not be able to make a determination about whether vessels meet the criteria for access. These vessels would not be considered to meet the criteria for access to the gear restricted area.

Under this alternative, the use of other authorized gear types such as buoy gear, green-stick gear, or rod and reel, would be allowed in the Cape Hatteras Gear Restricted Area by all pelagic longline vessels. NMFS could stop access by all pelagic longline vessels to the area via inseason action to address issues including: (1) failure to achieve or effectively balance the objective of reducing dead discards with the objective of providing fishing opportunity; (2) bycatch of bluefin tuna or other HMS that may be inconsistent with the objectives or regulations or the 2006 Consolidated HMS FMP or ICCAT recommendations; or (3) bycatch of marine mammals or protected species that is inconsistent with the MMPA, ESA, PLTRP, or relevant BiOps.

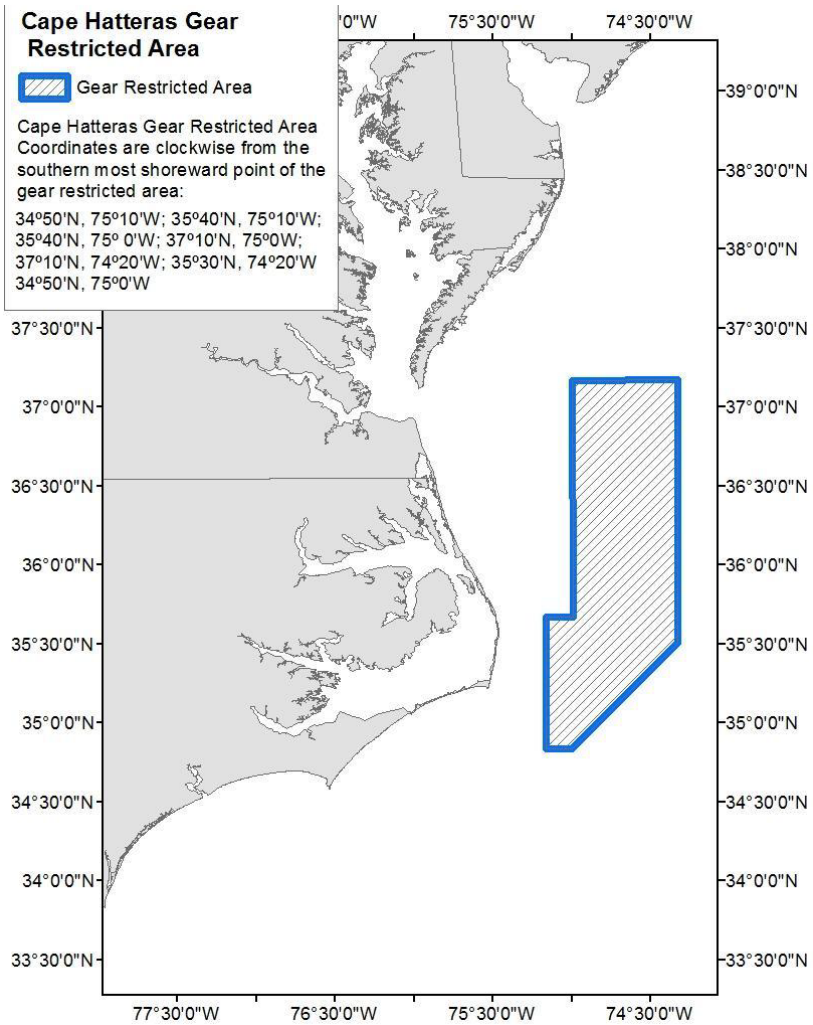

Figure 4.6 Cape Hatteras Gear Restricted Area

Ecological Impacts on Bluefin Tuna and Target Species

Table 4.13 shows the ecological impacts of Alternative B1 on bluefin tuna, as determined through the numbers of bluefin tuna kept and discarded alive or dead. It also shows the ecological impacts on some target species (swordfish, bigeye tuna, yellowfin tuna, and dolphin) as determined through the number of these species landed by the pelagic longline fishery. This table has been updated from the DEIS to the FEIS, through the inclusion of an additional year (2018) of HMS Logbook data into the analyses. NMFS expects that catch data would likely be similar to recent years under the no action alternative (Table 4.13). On average, 40 bluefin tuna mortalities (32 fish kept and 8 discarded dead) were reported annually for sets made from vessels granted access to the Cape Hatteras Gear Restricted Area from 2015 to 2018. On average, another 25 bluefin tuna were released alive annually by vessels granted access to the Cape Hatteras Gear Restricted Area per year. Similarly, there were approximately 2,431 target species (i.e., sum of swordfish, yellowfin tuna, bigeye tuna, and dolphinfish in Row F of Table 4.13) retained per year by vessels granted access to this area. Swordfish and yellowfin tuna comprised 40.5 percent (~986 fish/year) and 40 percent (~976 fish/year) of the average annual number of these target species retained. Fishery-wide, the area within the boundaries of the Cape Hatteras Gear Restricted Area contributed 6.86 percent of the total hooks fished during this portion of the year, and 10.36 percent of the hooks fished year round. Bluefin tuna mortalities (i.e., average annual number of fish retained and discarded dead) in the Cape Hatteras Gear Restricted Area recently accounted for 25.97 percent of the total bluefin tuna mortalities incurred by the pelagic longline fleet from December to April. Direct ecological impacts to bluefin tuna and other target species are anticipated to be neutral in the short- and long-term due to no anticipated changes in fishing effort by the majority of the fleet fishing in this area as a result of retaining the gear restricted area.

Ecological Impacts on Restricted and Protected Species

Table 4.14 shows the ecological impacts of Alternative B1 on restricted and protected species, determined through the total number of these species discarded. In the case of sea turtles, ecological impacts are determined from the number of total interactions, which is inclusive of turtles that are released unharmed, injured, or dead. This table has been updated from the DEIS to the FEIS, through the inclusion of an additional year (2018) of HMS Logbook data into the analyses.

Ecological impacts to restricted species and sea turtles are anticipated to be neutral due to no anticipated changes in fishing effort as a result of retaining the Cape Hatteras Gear Restricted Area under this No Action alternative (Table 4.14). Between 2015 and 2018, portions of the fleet granted access to the Cape Hatteras Gear Restricted Area contributed to less than 1 percent of the average annual, fleet-wide roundscale spearfish (1 fish/year), white marlin (3 fish/year), blue marlin (3 fish/year), and sailfish (0 fish/year) discards occurring during the effective period (Table 4.14, row F). Similarly, this area accounts for a small proportion of the average annual number of dusky shark discards (6.67 percent or ~4 sharks/year) and sea turtle interactions (18.18 percent or 10 turtles/year) occurring across the fishery during this time period.

During the Cape Hatteras Gear Restricted Area effective months in 2015 through 2018 (January-April, December), data from within the boundaries of this gear restricted area accounted for nearly 67.58 percent of the average annual shortfin mako discards across the fishery. However, in 2018 and 2019 rulemakings were completed to address ICCAT management recommendations aimed at reducing shortfin mako landings in commercial and recreational fisheries. While these measures are not expected to change the number of shortfin mako interactions (NMFS 2019), they may increase the number of shortfin mako live discards. For example, the addition of 2018 data to the

analysis shown in Table 4.14 increased the number of shortfin mako discards from 53 sharks/year to 123 sharks/year. Therefore, it is possible that the total number of shortfin mako discards may be different than what is estimated in this analysis as the fishery adjusts to these and any future ICCAT-related rulemakings concerning shortfin mako sharks.

Table 4.13 Average Annual Numbers of Target Species Kept and Bluefin Dead Discards (2015–2018) Reported for Sets Made within the Boundaries of the Cape Hatteras Gear Restricted Area and Calculations of Anticipated Ecological Effects of Alternative B1 (Rounded Up to the Nearest Whole Fish or Hook)

	Month	Hooks	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Swordfish Kept	Bigeye Kept	Yellowfin Kept	Dolphin Kept
A	January	24,702	6	9	3	223	12	44	1
B	February	7,581	6	7	1	46	2	7	0
C	March	1,502	5	2	0	4	1	10	1
D	April	12,044	12	6	3	76	25	106	37
E	December	66,438	3	1	1	637	382	809	8
F	Gear restricted area Dec–Apr average annual total (A+B+C+D+E)	112,268	32	25	8	986	422	976	47
G	Average annual # interactions across fishery (Jan–Apr, Dec)	1,632,758	130	56	24	8,822	3,038	6,890	2,806
H	Gear restricted area percent of average annual totals across fishery (Jan–Apr, Dec) (F/G)*100 (%)	6.86	24.6	44.64	33.33	11.18	13.89	14.16	1.67
I	Gear restricted area all months average annual total	529,073	58	31	10	1,916	3,048	9,166	3,029
J	Average annual # of interactions across fishery (year round)	5,107,997	415	260	74	25,152	13,636	32,941	39,096
K	Gear restricted area percent of average annual totals across fishery (year round) (I/J)*100 (%)	10.36	13.98	11.92	13.51	7.62	67.22	24.55	7.75

Table 4.14 Average Annual Numbers of Restricted Species and Sea Turtles (2015-2018) Reported for Sets Made within the Boundaries of the Cape Hatteras Gear Restricted Area, and Calculations of Anticipated Ecological Effects of Alternative B1 (Rounded to the Nearest Whole Fish)

	Month	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Sailfish Discards	Shortfin Mako Discards	Dusky Shark Discards	Sea Turtle Interactions
A	January	0	0	0	0	39	0	3
B	February	0	0	0	0	4	1	0
C	March	0	0	0	0	1	0	0
D	April	0	1	0	0	15	1	1
E	December	1	2	3	0	64	2	6
F	Gear restricted area Dec–Apr average annual total (A+B+C+D+E)	1	3	3	0	123	4	10
G	Average annual # interactions across fishery (Jan–Apr, Dec)	343	711	374	245	182	60	55
H	Gear restricted area percent of average annual totals across fishery (Jan–Apr, Dec) (F/G)*100 (%)	0.29	0.42	0.80	0	67.58	6.67	18.18
I	Gear restricted area all months average annual total	9	186	49	37	203	273	52
J	Average annual # of interactions across fishery (year round, all areas)	682	2,204	1,114	760	638	502	208
K	Gear restricted area percent of average annual totals across fishery (year round) (I/J)*100 (%)	1.32	8.44	4.40	4.87	31.82	54.38	25.00

Socioeconomic Impacts
All of the tables in this section have been updated to reflect the most recent information available. Table 4.15, which provides a summary of data from analyses of fishing data against access criteria for the Cape Hatteras Gear Restricted Area, has been updated from the DEIS to the FEIS to reflect data from an analysis completed for the December 2019 – April 2020 effective time period for this gear restricted area. Table 4.16 has also been updated to reflect the results of this analysis. Tables 4.17 and 4.18 have been updated to include an additional year of HMS logbook and e-Dealer data (2018) incorporated into the analyses to generate these tables. Figure 4.7 has been updated to include new HMS logbook data from 2018, which was used to generate this figure in the Three-Year Review of the IBQ Program.

Since the implementation of the Cape Hatteras Gear Restricted Area, the majority of the active pelagic longline vessels evaluated against criteria for performance metrics have met the criteria for access to the Cape Hatteras Gear Restricted Area (Table 4.15). However, the number of permit holders with data available for analysis has declined, coincident with an increase in the number of permits in "NOVESID" status (i.e., permits are renewed but not associated with a vessel) (Table 4.15). In the first year of the program, 136 vessels (~48 percent of the 281 pelagic longline permits) were determined to have sufficient data for the analysis, while 145 permits were either in NOVESID status, were inactive during the initial analysis period, or were in an invalid status. Approximately 75 percent of active vessels were granted access to the Cape Hatteras Gear Restricted Area. During the 2019-2020 effective period, 89 vessels (~31.7 percent of pelagic longline permits) had data available for analysis. This is indicative of trends observed recently in the fleet suggesting reduced fishery participation by permit holders since implementation of Amendment 7 management measures. The percentage of permit holders that met the criteria for access to the Cape Hatteras Gear Restricted Area has recently decreased. Approximately 79 percent of active vessels met the criteria for access to the Cape Hatteras Gear Restricted Area in the 2019-2020 effective period, the lowest percentage within an effective period since the first year of implementation.

Table 4.15 Access Decisions by Effective Period, Based on Permit Status and Data Availability

Data and Permit Status	Dec 2014 – Apr 2015	Dec 2015 – Apr 2016	Dec 2016 – Apr 2017	Dec 2017 – Apr 2018	Dec 2018 – Apr 2019	Dec 2019 – Apr 2020
Data available/ valid permit	136	115	108	101	97	89
Decision: Yes	*102*	*105*	*101*	*91*	*83*	*70*
Decision: No	*34*	*10*	*7*	*10*	*14*	*19*
Percentage Denied Access	*25%*	*9%*	*6.5%*	*10%*	*14%*	*21%*
Data available/ no valid permit		10	14	15	15	9
No data available/invalid permit status	145	166	172	179	181	191
NOVESID	*29*	*35*	*41*	*51*	*51*	*56*

Sources: HMS logbook data, Pelagic Observer Program.

In November 2019, NMFS determined that 19 vessels did not meet the criteria for access to the Cape Hatteras Gear Restricted Area; of these, 10 vessels did not meet the criteria for bluefin avoidance, and 9 vessels did not meet the criteria for compliance with POP and logbook requirements. Many of these vessels have not fished in the Cape Hatteras Gear Restricted Area since implementation of Amendment 7 management measures. For example, only three of the 10 vessels that did not meet the criteria for access to the Cape Hatteras Gear Restricted Area in winter

of 2019-2020 due to high bluefin interactions actually fished within the Cape Hatteras Gear Restricted Area in recent years (data points not shown to protect confidentiality). Further investigation into these data reveal that between 2016 and 2018 some vessels which did not meet the criteria for access to the Cape Hatteras Gear Restricted Area due to poor bluefin avoidance fished in the Northeast Distant Area (NED). The NED has a separate 25 mt quota to account for bluefin tuna mortalities. Bluefin tuna bycatch in the NED is managed within that 25 mt under different regulations, and these bluefin interactions (or landings) are not differentiated in the calculations used to evaluate access to the Cape Hatteras Gear Restricted Area. For example, the vessels that did not meet the criteria for access to the Cape Hatteras Gear Restricted Area in 2019 were ranked according to the highest number of bluefin interactions. The three vessels with the highest number of bluefin tuna interactions deployed between 12.5 and 34 percent of their sets in the NED between 2016 and 2018. Bluefin interactions within the NED accounted for between 9 and 42 percent of these vessel's total bluefin interactions. Furthermore, although the percentage of sets in the NED versus the rest of the Atlantic has not changed much across the fleet, in some years a higher percentage of total Atlantic bluefin tuna landings may come from the NED (Figure 4.7; note that this data has been updated from the DEIS to the FEIS through the addition of an extra year of data (2018)). These data raise questions about the ability of the Cape Hatteras Gear Restricted Area to incentivize fleet-wide reductions in bluefin tuna interactions, especially if vessels are fishing elsewhere throughout the year. IBQ is not being used in the NED until the 25 mt set-aside quota is reached, hence the fishing practices may differ depending on whether that quota is available to account for bluefin tuna. Furthermore, although bluefin tuna-to-target species ratios and compliance performance metrics (i.e., those associated with Pelagic Observer Program and Atlantic HMS logbook reporting) for vessels that did not meet the criteria for access have improved since the qualifying period (2006-2012), bluefin tuna-to-target species ratios have also increased since the second year of effectiveness (Chapter 3, Table 3.3). Many of the vessels not meeting the criteria for access are fishing in domestic statistical management areas far from the Cape Hatteras Gear Restricted Area from December through April, and may not be incentivized by performance metrics (see Table 4.16 and Figure 4.8 for a list and map showing). For example, the domestic statistical management area with the greatest number of sets by vessels not meeting criteria for access due to bluefin tuna to target species ratios was the NED. Many vessels not meeting criteria for access due to compliance issues made sets in the Florida East Coast domestic statistical management area. These vessels are likely more constrained by the IBQ Program in terms of accounting for and minimizing bluefin tuna interactions than any constraints that might arise from the presence of the Cape Hatteras Gear Restricted Area.

Since implementation of the IBQ Program in 2015, revenue generated by pelagic longline fishing in the Cape Hatteras Gear Restricted Area for target species such as swordfish and yellowfin tuna peaked in 2017 despite higher numbers of participants not meeting the criteria for access in later years (Table 4.17). Although still higher than the revenue estimated for sets deployed within the Cape Hatteras Gear Restricted Area during the first two years of the program, estimated set revenue decreased by 23 percent between 2017 and 2018. These patterns likely reflect fishermen adjusting business and fishing practices to comply with performance-based access the Cape Hatteras Gear Restricted Area and IBQ programs, and annual variability in effort, landings, and market forces. Sets made within the Cape Hatteras Gear Restricted Area between December and April (2015 through 2018) recently contributed approximately 8.9 percent of the revenue generated for swordfish, 4.3 percent of revenue from yellowfin tuna, 28.5 percent of the revenue from bigeye tuna, and 21.2 percent of the revenue from bluefin tuna (Table 4.18).

Retaining the Cape Hatteras Gear Restricted Area is likely to have neutral socioeconomic impacts fleet-wide, as the majority of vessels not meeting criteria for access to the Cape Hatteras Gear

Restricted Area did not make sets within this area either prior to implementation or after implementation when access was granted. Retaining the Cape Hatteras Gear Restricted Area may have temporary, minor adverse short-term socioeconomic impacts to individual vessels that either recently made sets in the Cape Hatteras Gear Restricted Area or may be denied access in the future.

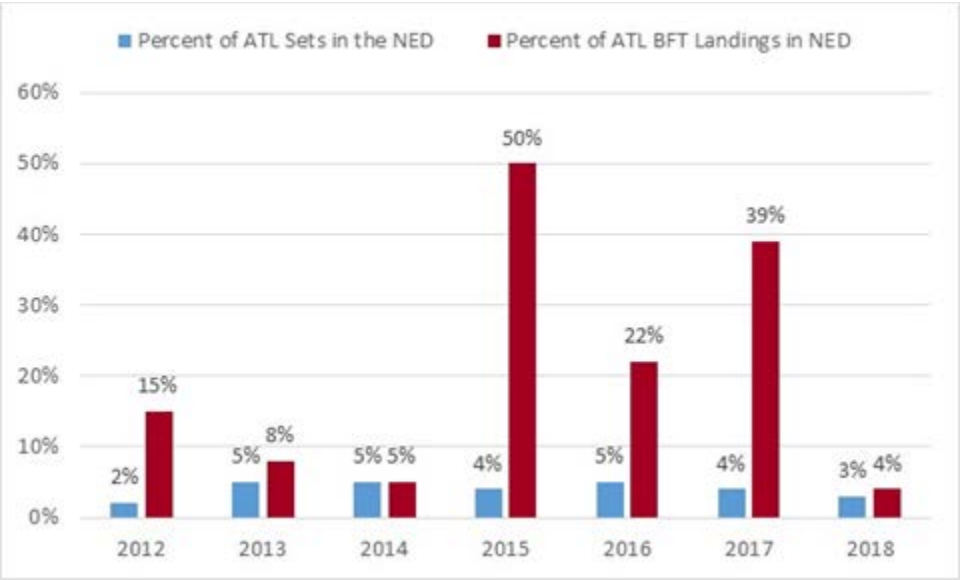

Figure 4.7 Distribution of Pelagic Longline Fishing Activity and Bluefin Landings in the NED versus the Rest of the Atlantic Fishing Region (Does Not Include Gulf of Mexico)
Source: Draft Three-Year Review of the IBQ Program.

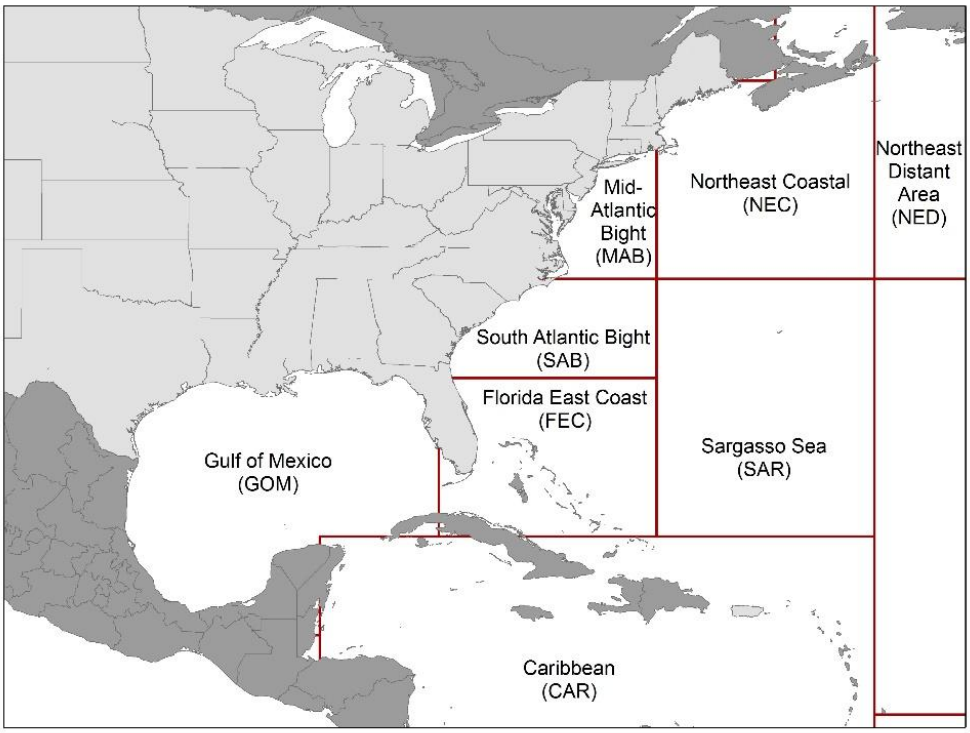

Figure 4.8 Domestic Statistical Management Areas

Table 4.16 Distribution of Set Locations (2016–2018) for Vessels not qualified to access the Cape Hatteras Gear Restricted Area due to Bluefin Avoidance (n = 10 vessels) and Compliance Issues (n = 9 vessels)

Domestic Statistical Management Area (see Figure 4.8)	Bluefin Avoidance (# Sets)	Bluefin Avoidance (% of Total) (Total = 2,249)	Compliance (# Sets)	Compliance (% of Total) (Total = 921)
CAR	**	**	No Data	----
FEC	275	12.2	78	8.5
GOM	236	10.5	427	46.3
MAB	723	32.15	95	10.3
NEC	154	6.85	**	**
SAB	361	16.0	279	30.3
SAR	134	6.0	**	**
NED	352	15.6	No Data	----
NCA	**	**	**	**
Other*	5	0.18	-----	-----

*Set locations are exactly on the border between two statistical areas and cannot be assigned to a specific statistical area.
^Pelagic Observer Program data used to calculate performance metric scores. POP data not used to compute or analyze set locations.
**Data not shown to protect confidentiality.
Sources: HMS logbook data, Pelagic Observer Program database.

Table 4.17 Estimated Set Revenue by Year and Species in the Cape Hatteras Gear Restricted Area during Effective Months (Dec–Apr), Rows A-D Rounded to the Nearest Dollar

	Year	Swordfish	Yellowfin Tuna	Bigeye Tuna	Dolphin	Bluefin Tuna	Total
A	2015	$424,830	$41,812	$93,773	$318	$14,740	$575,473
B	2016	$273,545	$35,348	$135,761	$3,530	$24,692	$472,876
C	2017	$341,544	$161,576	$562,056	$1,770	$84,901	$1,151,846
D	2018	$248,268	$129,968	$381,428	$244	$128,586	$888,493
E	Percent Change (2015 → 2018) ((C-A)/A) * 100 (%)	-41.6	+210.8	+306.8	-23.3	+772.4	+54.4

Data Source: HMS logbook data, HMS e-Dealer data

Table 4.18 Average Annual Estimated Set Revenue from Pelagic Longline Target Species and Bluefin in the Cape Hatteras Gear Restricted Area, 2015–2018

	Month	Swordfish	Yellowfin	Bigeye	Dolphin	Bluefin
A	1	$76,232.15	$1,200.07	$3,843.92	$0	$3,529.36
B	2	$17,399.21	$182.00	$232.50	$0	$5,438.39
C	3	$978.92	$48.00	$118.33	$0	$8,447.98
D	4	$31,717.69	$11,358.82	$15,675.21	$1,492.90	$19,279.75
E	12	$220,311.42	$66,789.71	$243,993.33	$380.00	$4,748.83
F	Gear restricted area Dec–April average annual $ (A+B+C+D+E)	$346,639.39	$79,578.60	$263.578.60	$1,872.90	$41,444.31
G	Fleet-wide Dec–Apr average annual $	$3,907,155.02	$2,455,605.23	$1,079,034.74	$112,630.11	$276,750.61
H	Gear restricted area percent of total $ (F/G)*100 (%)	8.87	3.24	24.45	1.66	14.98

Sources: HMS logbook, HMS eDealer.

Conclusion

Retaining the current regulations for the Cape Hatteras Gear Restricted Area would meet the objectives of continuing to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear. However, the IBQ Program effectively limits individual vessel landings or dead discards by fishery participants operating in this area. Retaining a gear restricted area with performance based access to limit bluefin tuna interactions (which no longer restricts many active fleet participants) while at the same time requiring fishery participants to individually account for their bluefin tuna catch through the IBQ Program, is unnecessarily restrictive of pelagic longline fishery effort, particularly where overall limits on quota are established through scientifically supported quotas and subsequently enforced and monitored through a careful management regime that further divides and manages that quota at several stages. This alternative is not aligned with the objective to simplify and streamline HMS management by reducing redundant regulations. Because it does not meet all the objectives of the rulemaking, NMFS does not prefer the No Action alternative at this time.

4.2.2 Alternative B2: Eliminate the Cape Hatteras Gear Restricted Area (Preferred Alternative)

This alternative would remove the current Gear Restricted Area off Cape Hatteras, North Carolina as currently defined in § 635.2 and all of its specific regulatory provisions, restrictions, and prohibitions.

Ecological Impacts on Bluefin Tuna and Target Species

Removing the Cape Hatteras Gear Restricted Area is not anticipated to have adverse impacts on the western Atlantic bluefin tuna stock. NMFS would closely monitor future fishing activity by vessels in this area, and levels of bluefin tuna bycatch would be limited by the IBQ Program and other measures such as EM. The majority of the fleet has met the criteria for access to the area in recent years (Table 4.15). Even with this level of access, there have been substantial reductions in the average annual number of interactions with bluefin tuna between historical periods (2006-2011, ~ 468 average annual interactions/year; see Chapter 3, Tables 3.24-3.26 of NMFS 2014), years immediately prior to Amendment 7 implementation (2012-2014, ~ 94 average annual interactions/year), and recent time periods (2015 through 2018, ~ 65 average annual interactions/year) in the boundaries of the Cape Hatteras Gear Restricted Area (Chapter 3.0, Section 3.5.2.2, Table 3.12).

Figures 4.9, 4.10, and 4.11 were updated from the DEIS to the FEIS to reflect an additional year of data in the maps on the right side of these figures, which show data following implementation of Amendment 7 (2015-2018). The hotspot of bluefin tuna interactions that was previously noted in Amendment 7 and used to delineate the Gear Restricted Area no longer appears to occur following implementation of Amendment 7 management measures (Figure 4.9). The amount of effort (Figure 4.10) and the catch-per-unit effort (Figure 4.11) that has occurred in the region has generally decreased before and after implementation, although higher catch-per-unit effort is noted in some of the sets in the gear restricted area. High catch rates (e.g., one cell in the right side map of Figure 4.11 has a catch-per-unit effort of 70.31 bluefin tuna per 10,000 hooks) in the Cape Hatteras Gear Restricted Area are a product of the effect of a reduction in hooks deployed and single sets that had a handful of bluefin tuna mortalities (e.g., between 1 and 10 bluefin retained or discarded dead, and between 100 to 650 hooks deployed). All bluefin mortalities were accounted for under the IBQ system against the Longline category quota. As noted in Table 4.15 above, approximately 21 percent of the active pelagic longline vessels with sufficient data to evaluate for performance-based access did not meet the criteria for access to the Gear Restricted Area in 2019-2020.

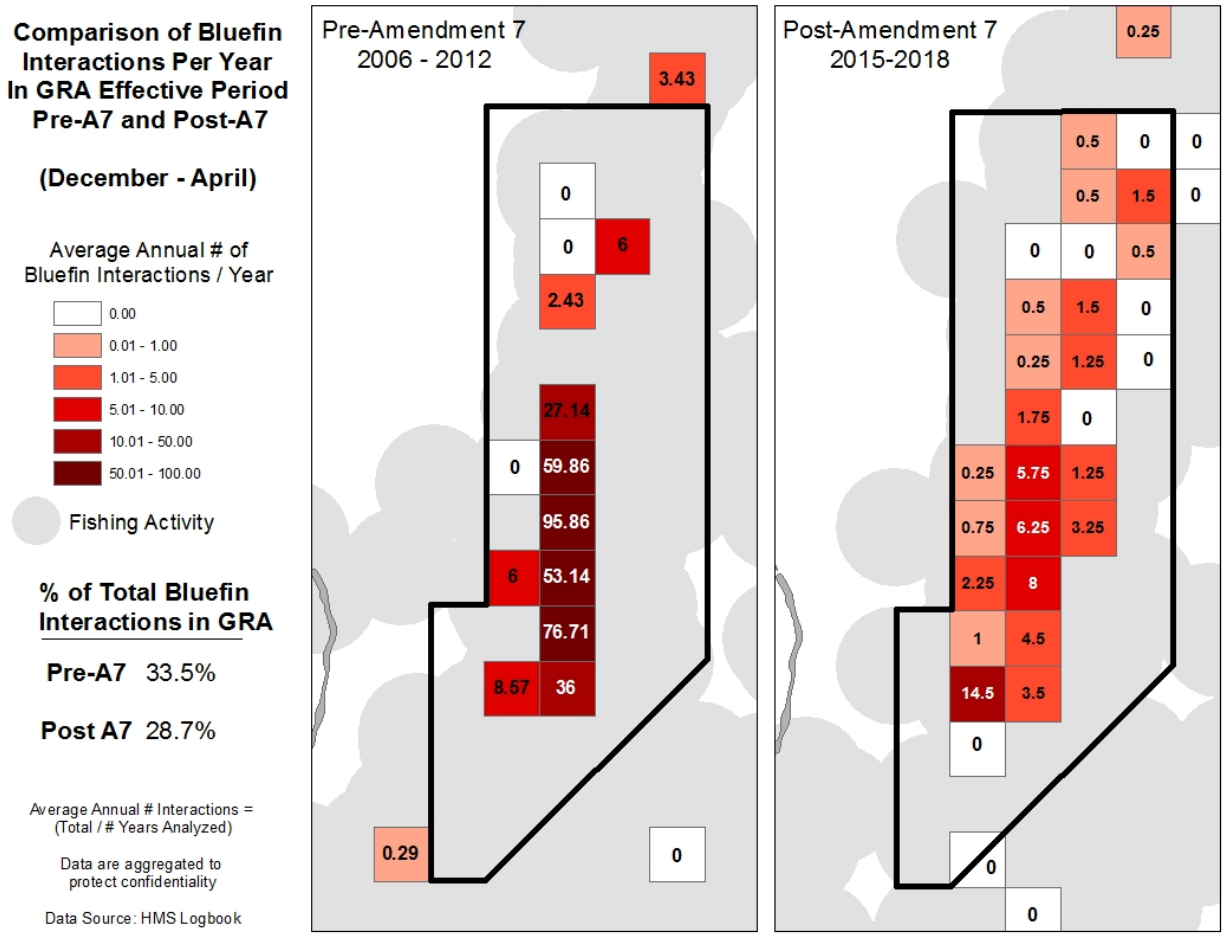

Figure 4.9 Number of Bluefin Interactions per Year in the Cape Hatteras Gear Restricted Area, Before and After Implementation of Amendment 7 Management Measures
Source: HMS logbook data.

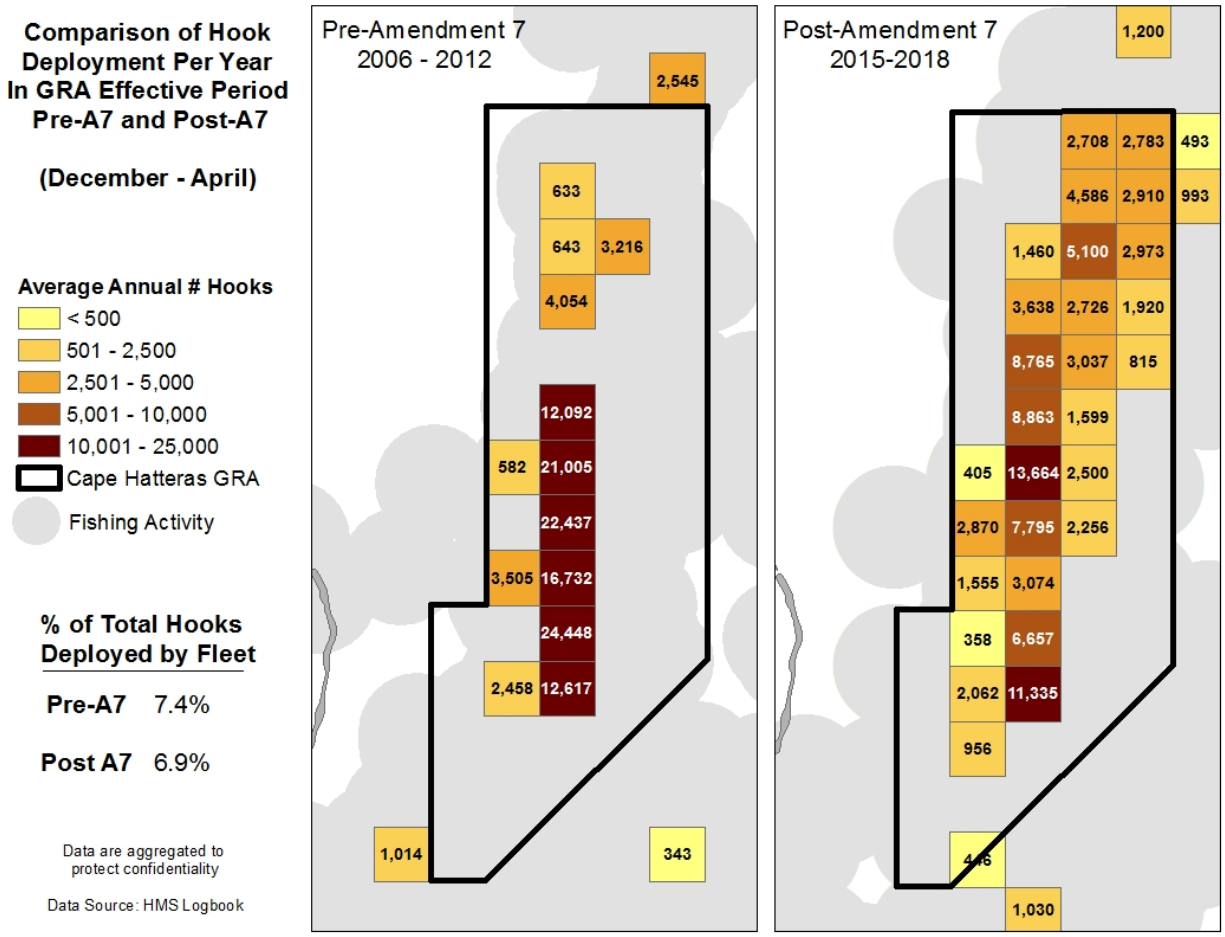

Figure 4.10 Number of Hooks Deployed per Year in the Cape Hatteras Gear Restricted Area, Before and After Implementation of Amendment 7 Management Measures
Source: HMS logbook data.

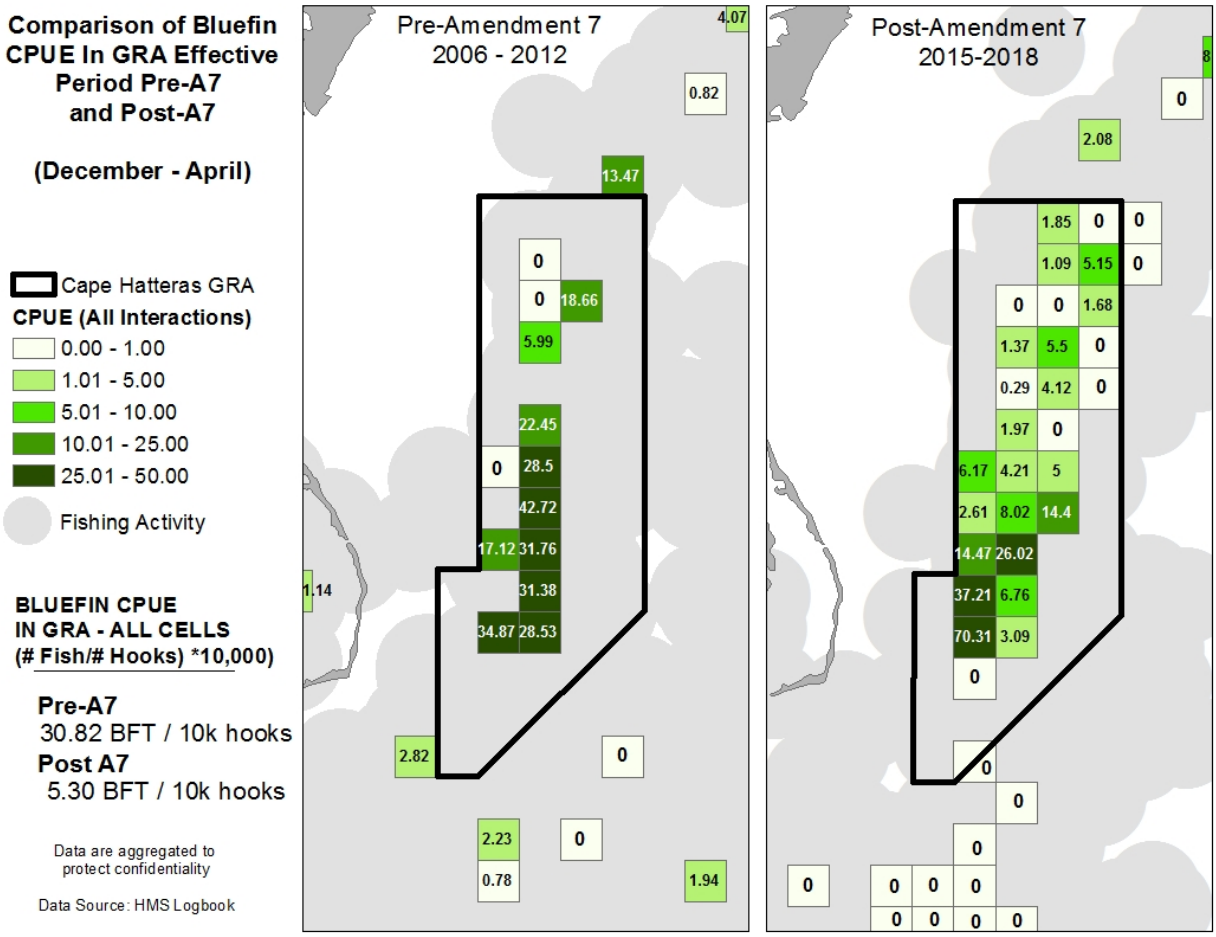

Figure 4.11 Bluefin CPUE in the Cape Hatteras Gear Restricted Area, Before and After Implementation of Amendment 7 Management Measures
Source: HMS logbook data.

Removal of the Cape Hatteras Gear Restricted Area would grant access to a small number of vessels that previously have not qualified for access to fish in this area. Under this alternative, NMFS anticipates that the IBQ Program will be able to adequately account for any bluefin tuna catch that occurs in the area, including accounting for any additional bluefin catch by vessels that previously did not meet the criteria for access, while also giving vessel owners more flexibility in deciding where to operate.

The vessels that did not meet criteria for access to the Cape Hatteras Gear Restricted Area in winter 2018-2019 were cumulatively issued 35,151 lb of Atlantic IBQ allocation and 3,041 lb of Gulf of Mexico IBQ annual allocation in 2017 and 2018. Assuming that the average weight of Atlantic and Gulf of Mexico landed bluefin tuna are 275 lb whole weight (ww) and 551 lb ww, respectively, the vessels that did not meet criteria for access were issued enough IBQ allocation on January 1 to account, collectively, for approximately 139 bluefin tuna per year. In addition, since implementation of the IBQ Program, NMFS has transferred between 34 and 44 mt of quota inseason to the Longline category through transfers from the Reserve category, which would cover an additional 26-33 bluefin tuna from the Atlantic region (for a total of 165-172 bluefin tuna). On average the vessels that did not meet criteria for access to the Cape Hatteras Gear Restricted Area in winter 2018-2019 collectively caught 204 bluefin tuna per year between 2015 and 2017 in the Atlantic and Gulf of Mexico. The excess (= 204 -165 or = 204 – 172, depending on the year) was fully accounted for using IBQ allocation either from inseason transfers or via leasing from other shareholders. IBQ shareholders that landed or discarded dead more bluefin than what can be covered by the allocation in their accounts entered a status referred to as "quota debt." There was usually an excess of quota available across the active pelagic longline vessels to cover quota debt. For example, in 2017 NMFS distributed 193.3 metric tons (426,098 lb) of IBQ allocation to the pelagic longline fleet; two-thirds of this amount (275,483 lb) was distributed annually as Atlantic IBQ category allocation. The total accountable catch was 115.5 metric tons (~254,631 lb, approximately 54 percent of the total adjusted available quota for the pelagic longline fleet) was comprised of 104.1 metric tons of landings and 11.4 metric tons of dead discards (Table 3.17). As a result of an ICCAT baseline quota increase, the 2018 adjusted total allocation available to the pelagic longline fleet was even higher (208.1 metric tons, or ~ 458,781 lb). Preliminary 2018 catch estimates, available on the SERO Catch Shares Online website under "Additional Information" (see report entitled "Commercial Quotas/Catch Allowances (All Years)") with Atlantic, Gulf of Mexico, and purse seine IBQ allocation categories were ~ 91 metric tons, ~8.4 metric tons, and 16.6 metric tons, respectively, for a total catch of ~115.9 metric tons.

The Cape Hatteras Gear Restricted Area may in itself no longer serve as an incentive for some vessels to avoid bluefin tuna. In the analyses supporting the implementation of the Cape Hatteras Gear Restricted Area in Amendment 7, NMFS found that 34 of the 136 vessels with sufficient history to participate in the IBQ Program fished within the boundaries of the gear restricted area between 2006 and 2012 during the months of December through April. Of these, fourteen vessels (approximately 39 percent) did not meet criteria for access to the area in winter 2014-2015. In more recent winters, the number of vessels not meeting criteria for access that previously fished within the gear restricted area boundaries has grown smaller. For example, only one vessel that did not meet criteria for access to the gear restricted area in 2018-2019 had recently deployed gear within its boundaries during the months of December through April in 2015, 2016, and 2017 (data not shown to protect confidentiality). Three vessels that did not meet criteria for access to the gear restricted area in winter 2019-2020 deployed sets within the boundaries of the gear restricted area during the months of December through April in 2016, 2017, and 2018 (data not shown, ~14 to 38 percent of total sets during this time period). Most of the other vessels that did not meet criteria for

access did not make a set within the boundaries of the gear restricted area. Rather, they fished in other locations such as the South Atlantic Bight, the high seas east of the Bahamas, Gulf of Mexico, the U.S. Caribbean, or in open areas of the Mid-Atlantic Bight during the affected months (December-April) (Table 4.16). Many of the vessels that did not meet criteria for access in 2018-2019 and 2019-2020 were highliner vessels that follow swordfish and yellowfin tuna through migratory pathways, and move between seasonal fishing grounds in locations far from the Cape Hatteras Gear Restricted Area. Several of the vessels that did not meet criteria for access have an established history of fishing in other locations. NMFS does not anticipate that these vessels will redistribute effort back into the Cape Hatteras Gear Restricted Area as they are likely situated to participate in HMS fisheries elsewhere (e.g., the Grand Banks/NED Area, the Blake Plateau, or the high seas east of the Bahamas).

The Amendment 7 performance-based access rules of the Cape Hatteras Gear Restricted Area are no longer needed to reduce bluefin tuna interactions because: (1) bluefin interactions within the Cape Hatteras Gear Restricted Area have been reduced to the point that an interaction hotspot is no longer discernible, despite continued access by the majority of the fleet; (2) bluefin tuna catch is limited through the IBQ program and vessels must account for landings and dead discards of bluefin (which can accrue significant financial consequences), and (3) many vessels may not be incentivized by the Cape Hatteras Gear Restricted Area since most effort (and bluefin tuna interactions) is happening outside of the Cape Hatteras Gear Restricted Area. Fishing patterns are not expected to change greatly from the data described under the No Action alternative since the majority of the fleet has met criteria for access in recent years, and to date all bluefin tuna interactions have been fully accounted for under the IBQ program. Therefore, the ecological impacts to bluefin tuna are expected to be the same as the No Action alternative, neutral.

Ecological impacts to target species (e.g., swordfish, yellowfin tuna) are expected to be neutral across the fleet. GIS analyses of catch rates (# fish per 10,000 hooks deployed) within the Cape Hatteras Gear Restricted Area and in surrounding areas suggest that spatial catch rate patterns are similar before and after implementation of Amendment 7 for swordfish (Figure 4.12; note that this figure has been updated from the DEIS to include an additional year of logbook data (2018)). Catch rates within the gear restricted area may have increased for yellowfin tuna (Figure 4.13; note that this figure has been updated from the DEIS to include an additional year of logbook data (2018)). The estimated number of yellowfin kept from sets made within the gear restricted area per 10,000 hooks deployed increased from 60.08 (2006 - 2012) to 86.78 (2015-2018). However, NMFS anticipates minimal impacts to target species as a result of select individuals not meeting criteria for access. As discussed above, most fishery participants met criteria for access to the Cape Hatteras Gear Restricted Area. Those that do not meet criteria for access may only be restricted from accessing the area temporarily, since access decisions are made annually. As previously noted, only one vessel that did not meet criteria for access to the Cape Hatteras Gear Restricted Area deployed gear within the area between 2015 and 2017. This participant met access criteria to the Cape Hatteras Gear Restricted Area in preceding years. Similarly, the three vessels that did not meet criteria for access in 2019-2020 had recently met access criteria, and fished within the gear restricted area in preceding years. Given the extremely small proportion of effort that is expected to be excluded from the Cape Hatteras Gear Restricted Area as a result of access decisions, and the temporary nature of such decisions, removal of the gear restricted area provisions are anticipated to have negligible impacts on target species stocks.

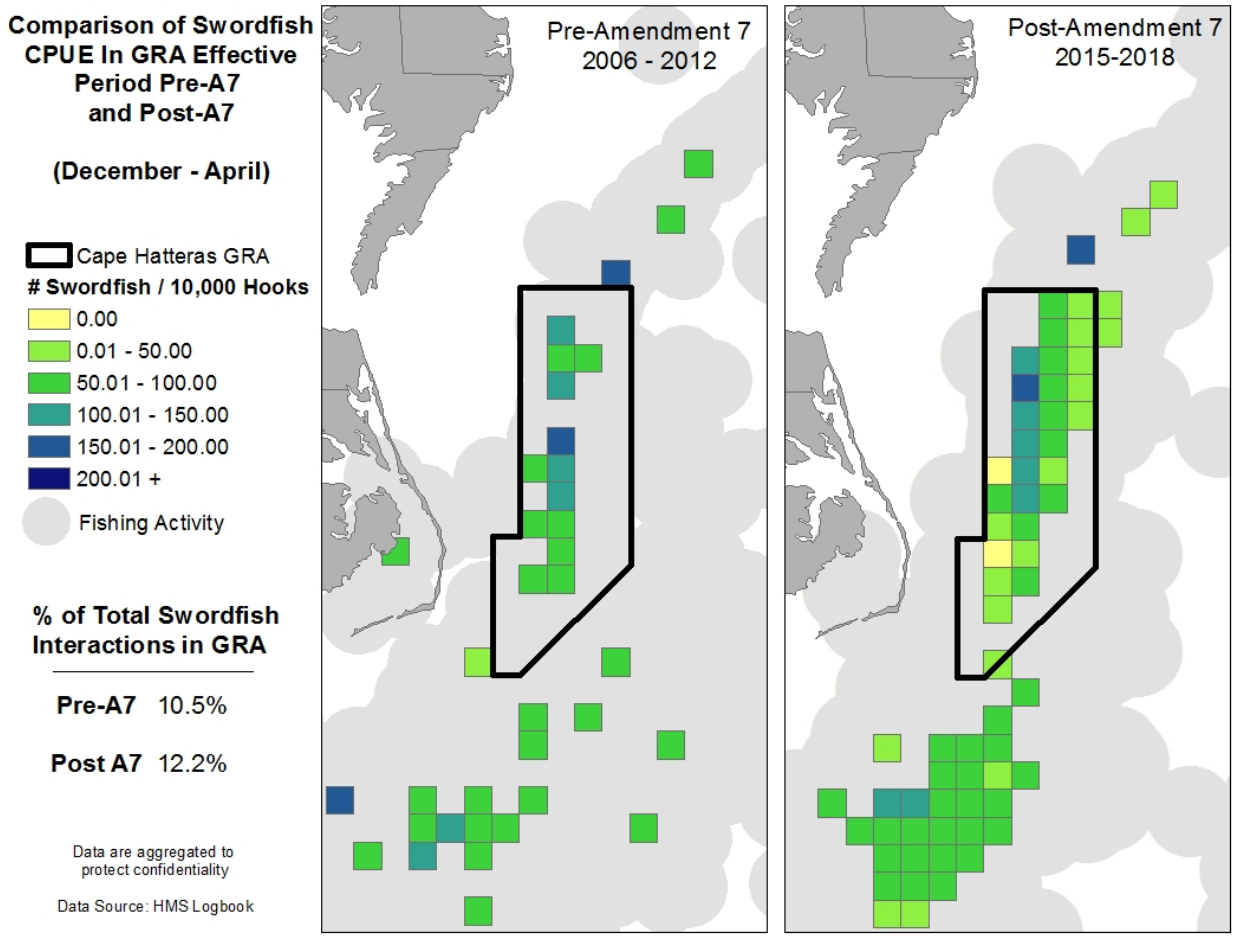

Figure 4.12 Catch Rates (# fish per 10,000 hooks deployed) of Swordfish Before and After Implementation of Amendment 7

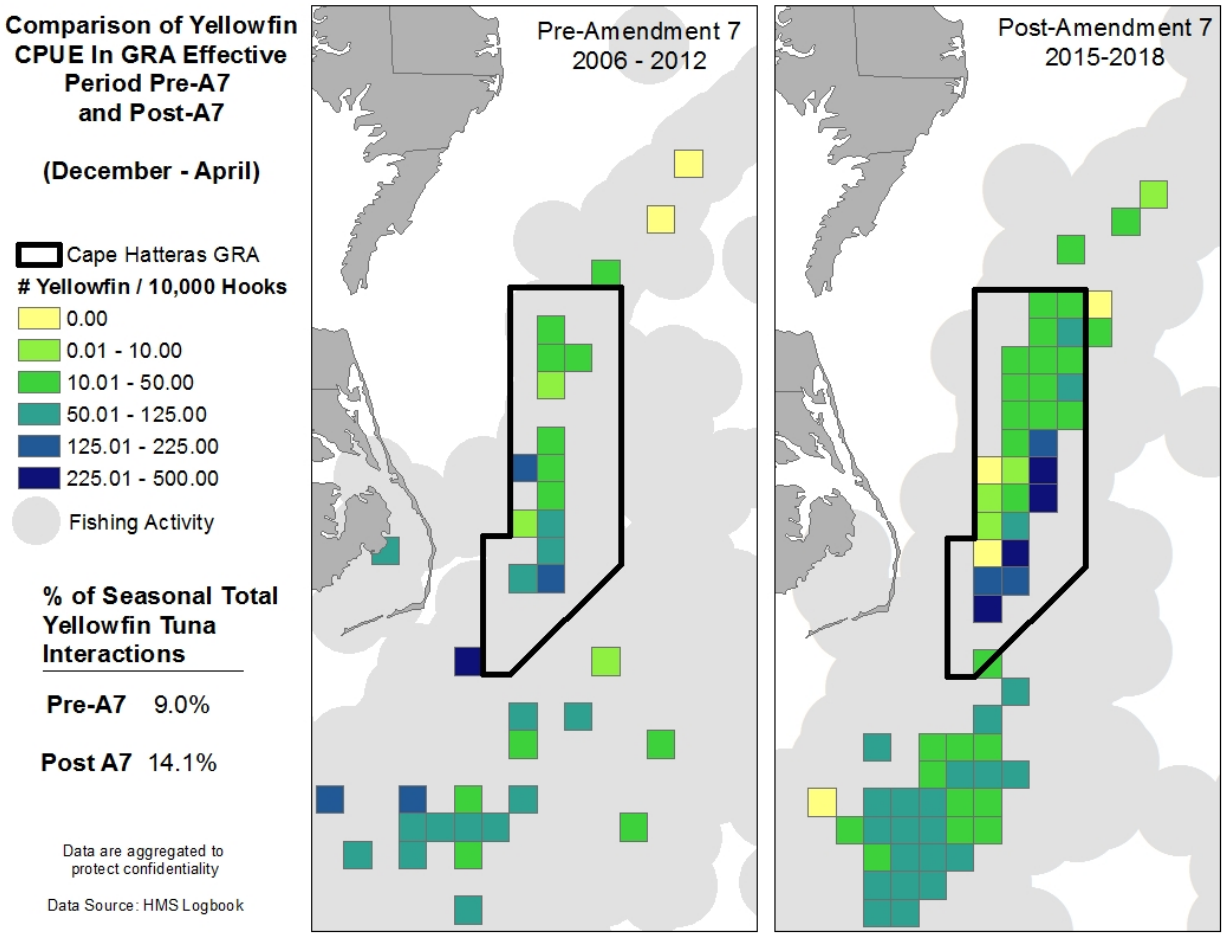

Figure 4.13 Catch Rates (# fish per 10,000 hooks deployed) of Yellowfin Tuna Before and After Implementation of Amendment 7

Ecological Impacts on Restricted or Protected Species

Ecological impacts to restricted species (billfish, shortfin mako, and dusky sharks) and protected species (sea turtles) are expected to be neutral across the fleet. As discussed above, most fishery participants are granted access to the Cape Hatteras Gear Restricted Area, and for the most part, recent (2015 through 2018) interactions in the Cape Hatteras Gear Restricted Area with billfish and dusky sharks were small (Table 4.14; note that this table has been updated from the DEIS to include an additional year of data (2018)). Only three vessels excluded from the gear restricted area over the last two winters (Dec 2018 - April 2019 and Dec 2019 - April 2020) deployed gear within the boundaries of the gear restricted area since implementation in 2015. Only one interaction with a billfish, a white marlin discarded alive, was reported in the HMS logbook by these three vessels. No other interactions with billfish, dusky sharks, or sea turtles were reported in the HMS logbook within the Cape Hatteras Gear Restricted Area between 2015 and 2018. Given the extremely small

proportion of effort that is expected to be excluded from the Cape Hatteras Gear Restricted Area as a result of access decisions, low numbers of expected interactions from the majority of the fleet that does have access to the area, and the temporary nature of such decisions (access decisions only are effective for a single year), removal of the Cape Hatteras Gear Restricted Area provisions are anticipated to have negligible impacts on these stocks.

The Cape Hatteras Gear Restricted Area represents a historically important fishing ground for shortfin mako sharks (e.g., see catch-per-unit effort data in Figure 4.14). For example, fishing in this area accounted for 64.5 and 80.5 percent of the fleet-wide interactions occurring from December-April before and after implementation of Amendment 7 measures. The increase in the proportion of interactions coming from this area over the two time periods is noteworthy. Vessels that fished in this area and were recently excluded from the Cape Hatteras Gear Restricted Area did retain some shortfin mako between 2015 and 2017 (data not shown to protect confidentiality). However, in 2018 and 2019 rulemakings were completed to address ICCAT management recommendations aimed at reducing shortfin mako landings in commercial and recreational fisheries. The pelagic longline fleet may no longer retain shortfin mako sharks unless they are dead at haulback. While these measures are not expected to change the overall number of shortfin mako interactions across the fishing extent of the fleet (NMFS 2019), they may increase the number of shortfin mako live discards and decrease the number of shortfin mako retained within and outside the Cape Hatteras Gear Restricted Area. Approximately 86 percent of the fleet interactions with shortfin mako shark came from the Cape Hatteras Gear Restricted Area between January and April, and in December of 2018. However, as previously discussed, the majority of the fleet had access to this area, and individuals denied access in one year often had access in preceding years. Over a long-term scale, interactions are not likely to change much, and ecological impacts on shortfin mako are anticipated to be neutral.

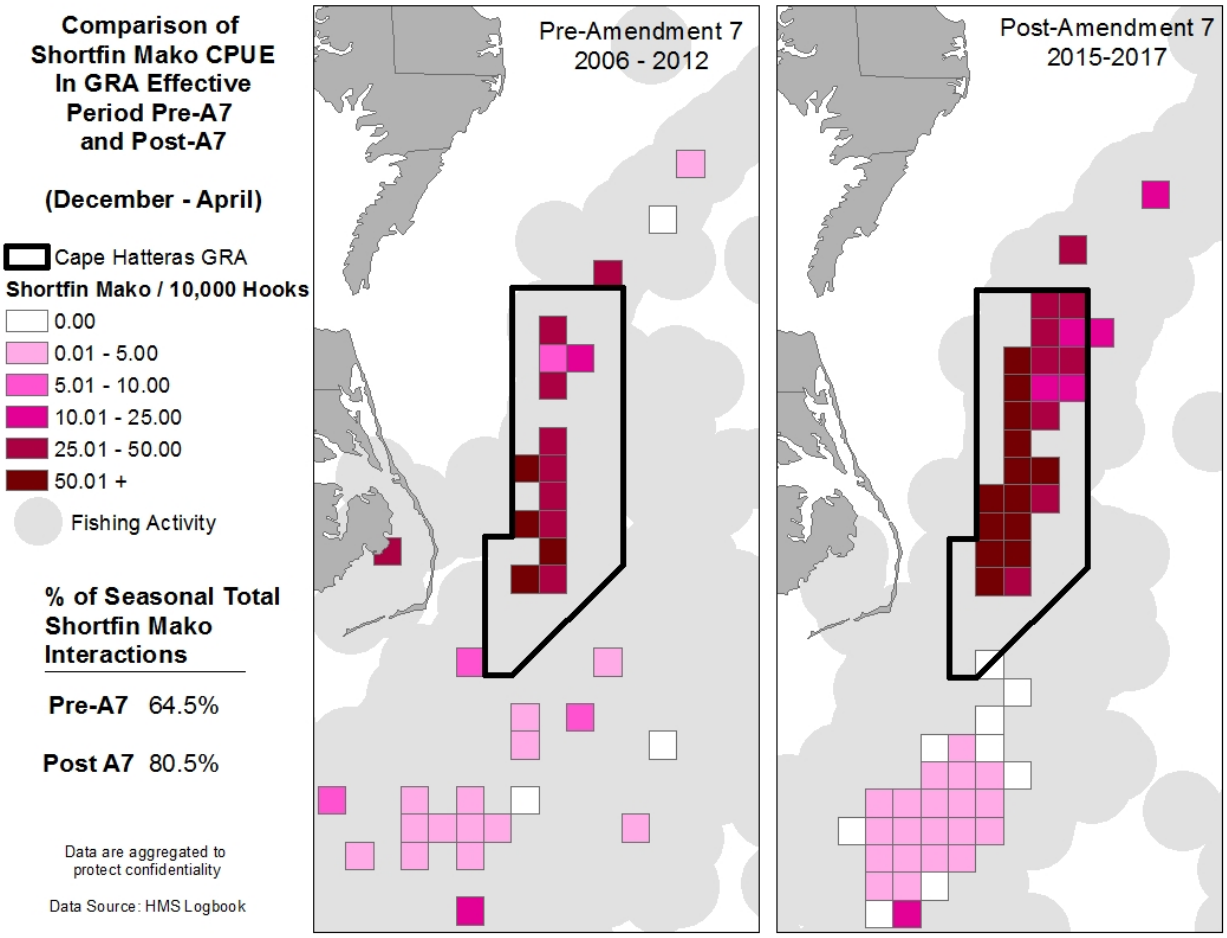

Figure 4.14 Catch Rates (# fish per 10,000 hooks deployed) of Shortfin Mako Before and After Implementation of Amendment 7

Socioeconomic Impacts

Removing the Cape Hatteras Gear Restricted Area is likely to have neutral to minor and beneficial socioeconomic impacts, depending on the scale of consideration. Socioeconomic impacts are anticipated to be the same as for Alternative B1. Fleet-wide effects on fishing revenue (Table 4.17, Table 4.18) for this time period are anticipated to be neutral as the majority of the fleet which fished in the area met access criteria for the area, and continued to fish in it following implementation of Amendment 7 management measures. Vessels that recently did not meet criteria for access (e.g., for the 2019-2020 effective winter periods) to the Cape Hatteras Gear Restricted Area fished in a variety of locations (Table 4.16) between 2016 and 2018. Many of these vessels did not make sets within this area either prior to implementation or after implementation of the area as part of Amendment 7. Revenue for these vessels may therefore be based on factors other than access to the Cape Hatteras Gear Restricted Area. Removing the Gear Restricted Area may have temporary, localized and minor beneficial socioeconomic impacts to a small number of individual vessels. Removing this restriction would remove regulations that are perceived by certain constituent groups to be unnecessary in conjunction with the IBQ Program. It would also reduce year-to-year uncertainty associated with access decisions for fishermen that do fish in the Cape Hatteras region. It may also provide a small number of fishermen with more options regarding fishing locations. The Cape Hatteras Gear Restricted Area is situated in a location where wintertime fishing activities are largely dependent on weather and wind direction. Cape Hatteras and adjacent Diamond Shoals shelter fishing grounds to the south and west from northerly and westerly winds, and to the north from southerly and westerly winds. Removing the Cape Hatteras Gear Restricted Area could enable greater flexibility for fishermen to safely conduct fishing activities in short, favorable wintertime weather windows.

Conclusion

There are multiple regulations that restrict bluefin tuna interactions in this region. Under the IBQ Program individuals are directly accountable for their bluefin tuna catch and dead discards and must use IBQ allocation to account for them. Overall, catch is limited by a science-based quota and the Longline category bycatch quota within that overall quota. It is further limited within the Longline category by the overall available IBQ allocation made available based on the procedures established in Amendment 7 and electronic monitoring and individual vessel accounting for the use of that allocation. Between 2015 and 2018, the pelagic longline fleet has used between 49 and 67 percent of the available Atlantic category IBQ allocation to cover landings and dead discards (see Commercial Quotas / Catch Allowances report for the SERO Catch Shares Online System). Retaining a gear restricted area with performance based access to limit bluefin tuna interactions (which no longer restricts many active fleet participants) while at the same time requiring fishery participants to individually account for their bluefin tuna catch through the IBQ Program, is unnecessarily restrictive of pelagic longline fishery effort, particularly where overall limits on quota are established through scientifically supported quotas and subsequently enforced and monitored through a careful management regime that further divides and manages that quota at several stages.

There is also some question as to the ability of the Cape Hatteras Gear Restricted Area to incentivize fleet-wide reductions in bluefin tuna interactions, especially if vessels are fishing elsewhere or under separate regulations. The purpose of performance metrics is to incentivize adjustments in fishing behavior to reduce bluefin tuna interactions, and they are especially useful in addressing excessive numbers of interactions by a small number of participants in a targeted area. When the program was first initiated, approximately 25 percent of the active fleet did not qualify for access.

Many of these vessels had historically fished, and had large numbers of reported interactions with bluefin tuna in the boundaries of what became the Cape Hatteras Gear Restricted Area between 2006 and 2012. Many of the vessels that were denied access to the Cape Hatteras Gear Restricted Area in the last two winters (i.e., December 2018 - April 2019 and December 2019 - April 2020) did not recently (2015 through 2018) fish in the Cape Hatteras Gear Restricted Area. Several of these vessels fished in other locations, such as the South Atlantic Bight, the Blake Plateau, or high seas areas east of the Bahamian EEZ. Some vessels with poor bluefin tuna avoidance scores interacted with bluefin tuna captured or discarded dead under a separate 25 mt quota for the NED, often at different times of the year than when the Cape Hatteras Gear Restricted Area is effective (Figure 4.7). As landings and dead discards count against the 25 mt NED quota until this threshold is reached, and not against their IBQ allocation, vessel operators have no incentive to avoid or release bluefin tuna when fishing in the NED. However, these interactions have been incorporated into performance metric calculations that grant or deny access to the Cape Hatteras Gear Restricted Area. In addition, there no longer appears to be a hotspot of bluefin tuna interactions even though the majority of the fleet has been granted access to the area. This implies that sufficient incentives are in place through the IBQ Program to control excessive bycatch by vessels that are operating locally or regionally.

Removing the Cape Hatteras Gear Restricted Area balances the objectives to optimize ability to harvest target species while continuing to minimize bycatch and bycatch mortality. It also simplifies and streamlines HMS management, simplifying compliance and enforcement, while also giving vessels a reasonable opportunity to catch available ICCAT quota for stocks in the directed fishery, consistent with ATCA requirements. For these reasons, this alternative is preferred at this time.

4.3 Spring Gulf of Mexico Gear Restricted Area

In this document, NMFS analyzes several alternatives to evaluate whether measures for the Spring Gulf of Mexico Gear Restricted Area (which consists of two areas in the north-central Gulf of Mexico) are still necessary to reduce and/or maintain low numbers of pelagic longline bluefin tuna discards and interactions. The alternatives, which are listed below, range from maintaining the status quo under the No Action alternative to eliminating the gear restricted areas. The preferred alternative being considered for the Spring Gulf of Mexico Gear Restricted Area supports the purpose, need, and objectives of this action. Further support of this is outlined in the conclusion section of the preferred alternative (Alternative C3) of this chapter. Where appropriate, data tables and discussion have been updated to include an additional year of HMS logbook data (2018). Figures and tables with this additional year of data will indicate the new data as part of a date range (i.e., 2015 – 2018 instead of 2015 – 2017).

During scoping for this rulemaking and during the public comment period for the proposed rule and the DEIS, NMFS received comments in support of eliminating the gear restricted area and allowing pelagic longline fishermen into the areas during April-May provided that interactions do not meet a designated threshold. However, commenters also expressed strong opposition to modifying or removing the Spring Gulf of Mexico Gear Restricted Area or relieving restrictions on pelagic longline fishing in the Gulf of Mexico in any way. Many commenters pointed out that existing gear restricted areas include the spawning grounds for western Atlantic bluefin tuna. There was also support for the preferred alternative by commercial pelagic longline fishermen in order to gather data from within the gear restricted area (see Response to Comments in Appendix F).

The alternatives analyzed in this FEIS include:

Alternative C1: No Action. Spring Gulf of Mexico Gear Restricted Area remain closed to all vessels using pelagic longline gear onboard from April 1 through May 31 of a given year.

Alternative C2: Apply individual performance based access to the Spring Gulf of Mexico Gear Restricted Area.

Alternative C3: Evaluate the Spring Gulf of Mexico Gear Restricted Area (Preferred Alternative).

Alternative C4: Eliminate the Spring Gulf of Mexico Gear Restricted Area.

4.3.1 Alternative C1: No Action. Maintain the Spring Gulf of Mexico Gear Restricted Area.

This alternative would maintain the current regulations regarding the Spring Gulf of Mexico Gear Restricted Area at § 635.2 and § 635.21(c)(2)(vi). These areas would maintain current restrictions that prohibit the use of pelagic longline gear for all vessels with pelagic longline gear onboard from April 1 through May 31 each year.

Ecological Impacts on Bluefin Tuna and Target Species

As described above, this alternative would not allow pelagic longline fishing to occur during April and May within the boundaries of the Spring Gulf of Mexico Gear Restricted Area. The bluefin tuna present in this area during April and May are primarily there for spawning in the only known spawning grounds of the western Atlantic stock. The Spring Gulf of Mexico Gear Restricted Area was identified in Amendment 7 as containing areas of higher concentrations of bluefin tuna in April and May. Since this spawning activity is occurring reducing interactions in the Gulf of Mexico by maintaining this gear restricted area could enhance spawning potential and stock growth. Any potential protection of bluefin tuna in the areas could continue to occur. This alternative would not allow for any fishery-dependent data collection during the course of normal fishing operations from the areas that could be used to evaluate the necessity or effectiveness of the Spring Gulf of Mexico Gear Restricted Area.

Because the gear restricted areas have been closed to data collection for three years during April and May, and pelagic longline fishery data from the open areas of the Gulf of Mexico is available, an assessment of the ecological impacts from maintaining the gear restricted areas was based on analyzing logbook data from the surrounding region (i.e., the open areas of the entire Gulf of Mexico during April and May), with the expectation that recent trends would likely be reflective of future trends if nothing changes. Amounts of interactions of bluefin tuna and target species (swordfish, yellowfin and bigeye tunas, and dolphin) in the Gulf of Mexico during the time period of the Spring Gulf of Mexico Gear Restricted Area are shown in Table 4.19 for 2015 through 2018. The amount and distribution of effort is not anticipated to change under the No Action alternative. The protection of spawning fish in the areas would continue to occur if the areas remain closed to pelagic longline gear. Fishery dependent data could not be collected that characterizes what interactions could have occurred under the IBQ Program in the area and if the area is appropriate located (i.e., whether or not it is it achieving its intended goals). Therefore, this alternative would maintain recent catch levels and patterns, resulting in neutral direct ecological impacts to bluefin tuna and target species in the short- and long-term.

Table 4.19 Pelagic Longline Landings and Discards for Bluefin and Target Species in the Open Area of the Gulf of Mexico during the Time Period of the Spring Gulf of Mexico Gear Restricted Area (April–May, 2015–2018)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
Average annual amount	576	247	4	5	1,317	89	12	23	121

Ecological Impacts on Restricted and Protected Species

Discards of white marlin, blue marlin, sailfish, and dusky sharks, as well as shortfin mako shark interactions and sea turtle interactions, in the open areas of the Gulf of Mexico during the time period of the Spring Gulf of Mexico Gear Restricted Area are shown in Table 4.20 for 2015 through 2018. All dispositions of shortfin mako sharks were tallied together since the vast majority of mako sharks caught have been released alive following the implementation of Amendment 11, which requires the release of any shortfin mako sharks that are alive at haulback of the gear. This alternative would not affect recent catch levels because the amount and distribution of effort is not anticipated to change, resulting in neutral, indirect ecological impacts to restricted and protected species in the short- and long-term.

Table 4.20 Pelagic Longline Revenue for Bluefin and Target Species in the Open Area of the Gulf of Mexico during the Time Period of the Spring Gulf of Mexico Gear Restricted Area (April–May, 2015–2018)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark Interactions	Dusky Shark Discards	Sea Turtle Interactions
Average annual interactions	8	45	34	54	14	13	3

Socioeconomic Impacts

Given the restrictions that prohibit pelagic longline fishing in the gear restricted areas during their effective period, data in this section reflect pelagic longline revenue for open areas of the Gulf of Mexico. Revenue for bluefin tuna and target species in the Gulf of Mexico during the time period of the Spring Gulf of Mexico Gear Restricted Area are shown in Table 4.21 for 2015 through 2018. Average annual revenue for bluefin tuna and target species combined during this time period was $677,007. This alternative would maintain the recent landings levels and revenues, as well as the continued lack of data collection from within the gear restricted areas, resulting in neutral direct (fishermen) and indirect (supporting businesses and communities) socioeconomic impacts in the short- and long-term.

Table 4.21 Pelagic Longline Revenue for Bluefin and Target Species in the Open Area of the Gulf of Mexico during the Time Period of the Spring Gulf of Mexico Gear Restricted Area (April–May, 2015–2018)

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept	Total Target Species
Average Annual Revenue	$308,959	$10,731	$348,227	$5,068	$4,022	$677,007

Conclusion

While this alternative would provide continued protections for bluefin tuna in the peak months of spawning, April and May, in the Spring Gulf of Mexico Gear Restricted Area, there is uncertainty due to lack of data from within the gear restricted areas as to whether they are still appropriately located or needed to meet bluefin tuna management objectives. As described in Chapter 1, and shown in the analyses in Alternatives C2, C3, and C4, the Spring Gulf of Mexico Gear Restricted Area may no longer be necessary to reduce and/or maintain low numbers of pelagic longline bluefin tuna discards and interactions, particularly given the recent successes with the IBQ Program and the shift in management focus towards individual vessel accountability in the pelagic longline fishery. Therefore, although the No Action alternative might meet the objective of continuing to minimize bycatch and bycatch mortality of bluefin tuna, it does not meet the objectives of optimizing the ability of the pelagic longline fleet to harvest target species quotas or streamlining and simplify HMS management by reducing regulations that may be redundant in effect. For these reasons, NMFS does not prefer this alternative at this time.

4.3.2 Alternative C2: Allow individual performance-based access to the Spring Gulf of Mexico Gear Restricted Area

This alternative would allow performance-based access to the Spring Gulf of Mexico Gear Restricted Area using the access criteria currently used for the Cape Hatteras Gear Restricted Area (currently codified at § 635.21(c)(3) and § 635.14). The process for evaluating vessels with performance based metrics is described in the first paragraph of Alternative A3 and would be applied to this alternative.

In the analyses of gear restricted area access for 2018 - 2019 and 2019 - 2020, three to five pelagic longline vessels that did not qualify for access to from the Cape Hatteras Gear Restricted Area out of a total of 52 vessels associated with Gulf of Mexico IBQ shares. Those same vessels would not qualify for access to the Spring Gulf of Mexico Gear Restricted Area under this alternative. Therefore, based on this information, between 90 and 94 percent of vessels that were associated with Gulf of Mexico IBQ shares would be expected to have access to the Spring Gulf of Mexico Gear Restricted Area under this alternative.

Under this alternative, the use of other authorized gear types such as buoy gear, green-stick gear, or rod and reel, would be allowed in the Spring Gulf of Mexico Gear Restricted Area by all properly permitted vessels. NMFS could stop access by all pelagic longline vessels to the areas via inseason action to address issues including: (1) failure to achieve or effectively balance the objective of reducing dead discards with the objective of providing fishing opportunity; (2) bycatch of bluefin tuna or other HMS that may be inconsistent with the objectives or regulations or the 2006

Consolidated HMS FMP or ICCAT recommendations; or (3) bycatch of marine mammals or protected species that is inconsistent with the MMPA, ESA, PLTRP, or relevant BiOps.

Ecological Impacts on Bluefin Tuna and Target Species

The predicted effort that could occur in the Spring Gulf of Mexico Gear Restricted Areas with performance based access was estimated using both historical effort and current effort. First, NMFS calculated the percent of the total hooks that were fished in the area covered by the current Spring Gulf of Mexico Gear Restricted Area, and the open area of the Gulf of Mexico outside those areas, in April and May of 2012 through 2014. These years were selected because it is the three-year period immediately preceding implementation of the Spring Gulf of Mexico Gear Restricted Area in Amendment 7. Data from this time period are assumed to closely reflect a situation that could occur under this alternative if access were granted to the gear restricted area (since most vessels would have access). The percentage of the total hooks calculated from the historical data were then multiplied by the effort occurring in the open area of the Gulf of Mexico in April and May of 2015 through 2018 (i.e., the four-year time period when the Spring Gulf of Mexico Gear Restricted Area have been in effect), to predict the amount of effort that would be fished in the Spring Gulf of Mexico Gear Restricted Area if performance based access is applied (Table 4.22). Both historical and current effort numbers were annualized.

Table 4.22 Annual Predicted Effort Calculations for the Spring Gulf of Mexico Gear Restricted Area

Historical effort in the area of the Gulf of Mexico Gear Restricted Area (April and May, 2012–2014)	Historical effort in the area outside the Gulf of Mexico Gear Restricted Area (April and May, 2012-2014)	Historical percent of total hooks in the Gear Restricted Area	Current effort in Gulf of Mexico Open Area (April and May, 2015–2018)	Expected effort to be fished in Spring Gulf of Mexico Gear Restricted Area
142,757 hooks	243,614 hooks	37 percent	169,753 hooks	62,721 hooks

To estimate the amounts of interactions that could occur during the months of April and May in the Spring Gulf of Mexico Gear Restricted Area, NMFS used fleet-wide CPUE for the month prior (March) and the month after (June) the Spring Gulf of Mexico Gear Restricted Area are in place to predict CPUE and numbers of interactions for the months of April and May. The CPUE for both months provide a range of catch rates that may be expected to occur during the months of April and May. The CPUEs for March and June were derived from pelagic longline sets within the area of the Spring Gulf of Mexico Gear Restricted Area in 2015 through 2018, which provide the best available data for the Spring Gulf of Mexico Gear Restricted Area. CPUE were multiplied with the predicted effort numbers to provide a range of predicted interactions that would occur in the Spring Gulf of Mexico Gear Restricted Areas. Given that NMFS anticipates that only 37 percent of the current effort (2015-2018) would occur in the Spring Gulf of Mexico Gear Restricted Area, it is assumed that the remaining 63 percent of effort would still continue to occur in the open area of the Gulf of Mexico. Therefore, NMFS calculated numbers of interactions for the open area along with the predicted catches in the gear restricted area to determine the overall ecological impacts to species considered in this analysis. The numbers of interactions were annualized for each species, as shown in Table 4.23. Some effort would presumably still occur outside the area even after allowing access to the area, therefore, 63 percent of the baseline interactions has been added to Table 4.23 (second to last row) to estimate the total impact of Alternative C2.

NMFS calculated the annual harvest from the area to be opened under this alternative by multiplying the CPUE by the estimated annual effort, and dividing that number by 10,000, which was necessary since catch rates are presented on a unit per 10,000 hook basis.

This analysis assumes that all vessels with Gulf of Mexico IBQ shares would have access to the Spring Gulf of Mexico Gear Restricted Area. As described above, at least 90 to 94 percent of vessels with Gulf of Mexico IBQ shares have had access to the Cape Hatteras Gear Restricted Area since implementation, and a comparable or higher level of access would be expected for the Spring Gulf of Mexico Gear Restricted Area. There could be a slight decrease in effort or interactions within the Spring Gulf of Mexico Gear Restricted Area from the values described here, with a corresponding increase in effort or interactions in the open area, due to vessels excluded from the areas, but the predicted ranges of interactions still represent the best estimate for these areas.

The short-term direct ecological impacts on bluefin tuna as a result of this alternative are likely to be neutral, as the range of interactions estimated is comparable to current interactions under the No Action alternative (Alternative C1, compare CPUE in Table 4.19 and Table 4.23). Additionally, allowing performance based access to the Spring Gulf of Mexico Gear Restricted Area would mean any vessels that have not shown the ability to effectively avoid bluefin tuna would be excluded from the areas. Catch of bluefin tuna is also limited to the amount of IBQ allocation available to pelagic longline vessels for the Gulf of Mexico, which was set at a sustainable level under Amendment 7. The operational rules surrounding the individual vessel cap will not change, and the same restrictions previously implemented for the fleet would still be operational if vessels were granted performance based access. This lack of change in the regulatory environment further underscores the neutral impact that this alternative would have on bluefin tuna.

The short-term, direct ecological impacts on all target species as a result of this alternative are likely to be neutral (Table 4.23). Current interactions of target species from the open area of the Gulf of Mexico fall within the range of predicted interactions, with the exception of a predicted lower number of swordfish kept. Also, the ranges of yellowfin tuna landings and discards are above and below the expected landings and discards of yellowfin tuna under alternative C2 (compare catch-per-unit effort in Table 4.19 and Table 4.23). Should the landings and discards increase, the magnitude of potential increases in yellowfin tuna landings and discards are small and are not anticipated to greatly increase the overall United States catch of yellowfin tuna. Therefore, the direct, short-term ecological impacts for yellowfin tuna are likely to be neutral. As described under the socioeconomic impacts, access to the Spring Gulf of Mexico Gear Restricted Area will give fishermen the opportunity to make decisions about where to fish depending on fish availability, and the flexibility to fish in areas that optimize target catch while minimizing bycatch. If swordfish and yellowfin tuna landings in the Gulf of Mexico decrease due to shifting effort into the gear restricted areas, as predicted in this analysis, then fishermen would likely remain outside of the areas, maintaining neutral ecological impacts to those species.

Table 4.23 CPUE Ranges and Predicted Pelagic Longline Landing and Discard Ranges for Bluefin and Target Species for the Spring Gulf of Mexico Gear Restricted Area and Total Gulf of Mexico in April–May (2015-2018)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
CPUE range from March & June, 2015–2018 (per 10,000 hooks)	6.2–20.2	7.5–15.7	0–0.7	0.4–0.6	52.6–100.7	0.6–16.7	0.6–3.9	0.1–0.3	0.8–16.0
Predicted effort in the gear restricted areas	62,721 hooks								
Predicted range in the gear restricted areas (based on 37 percent of fishing effort)	39–127	47–98	0–4	2–4	330–632	4–105	4–25	0–2	5–100
Predicted amount in the open area (based on 63 percent of fishing effort)	363	155	3	3	830	56	8	15	76
Predicted range of total Gulf of Mexico amounts (sum of two rows above)	402–490	202–253	3–7	5–7	1,160–1,462	60–161	12–33	15–17	81–176
Average annual amount from the open areas of the Gulf of Mexico (Alternative C1)	576	247	4	5	1,317	89	12	23	121

Long-term impacts on these species would depend on future trends in performance based access to the Spring Gulf of Mexico Gear Restricted Area. If the number of vessels allowed access to these areas remains consistent over time, long-term impacts would be expected to be the same as short-term impacts.

Ecological Impacts on Restricted and Protected Species

The same methods for estimating protected species interactions were used as presented above for impacts to bluefin tuna and pelagic longline target species. The predicted effort is the same hook value as used above (i.e., see hook data in Table 4.22 and Table 4.23). Discards were summed for all of the billfish species and dusky sharks. All dispositions of shortfin mako sharks were tallied together since the vast majority of mako sharks caught have been released alive following the implementation of Amendment 11, which requires the release of any shortfin mako sharks that are alive at haulback of the gear. Also, due to low interactions with sea turtles, all sea turtle interactions were combined. The interaction numbers were annualized for each of these restricted and protected species, as shown in Table 4.24. The last row of data in the table shows the average annual interactions under Alternative C1 (No Action) for comparison purposes.

Compared to the No Action alternative (C1), white marlin and blue marlin discards are predicted to decrease slightly or increase slightly under this alternative, while sailfish discards would decrease slightly or increase. This alternative would result in short-term, indirect, minor, beneficial to minor adverse impacts to marlins and sailfish. Shortfin mako shark interactions and dusky shark discards would decrease, resulting in short-term indirect minor beneficial impacts. Sea turtle interactions would remain the same under this alternative, resulting in short-term, indirect, neutral impacts. If the number of vessels allowed access to these areas remains consistent over time, long-term impacts would be expected to be the same as short-term impacts. As described above, this analysis assumes that all vessels with Gulf of Mexico IBQ shares would have access to the Spring Gulf of Mexico Gear Restricted Area. There could be a slight decrease in effort or interactions within the Spring Gulf of Mexico Gear Restricted Area from the values described here, with a corresponding increase in effort or interactions in the open area, due to vessels excluded from the areas, but the predicted ranges of interactions still represent the best estimate for these areas.

Table 4.24 CPUEs Ranges Discards for Restricted and Protected Species for the Spring Gulf of Mexico Gear Restricted Areas and Total Gulf of Mexico in April–May (2015-2018)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark Interactions	Dusky Shark Discards	Sea Turtle Interactions
CPUE range from March & June, 2015–2018 (per 10,000 hooks)	0.8–4.1	0.7–3.7	0.5–3.4	0.2–4.3	0.1–0.3	0.1–0.3	0.1–0.3
Predicted effort in the gear restricted areas	62,721 hooks						
Predicted range of amounts in the gear restricted areas (based on 37 percent of fishing effort)	5–26	4–23	3–21	1–27	1–2	0–2	1–2
Predicted amount in the open area (based on 63 percent of fishing effort)	5	28	22	34	9	8	2
Predicted range of total Gulf of Mexico amounts (sum of two rows above)	10–31	32–51	25–43	35–61	10–11	8–10	3–4
Average annual amount from the open areas of the Gulf of Mexico (Alternative C1)	8	45	34	54	14	13	3

Socioeconomic Impacts

Ladings estimates presented in Table 4.24 were used to estimate a range of socioeconomic impacts on commercial pelagic longline fishermen. Average annual revenue for each species was calculated using data from the months of April and May in the open area of the Gulf of Mexico (Table 4.25). The average annual revenue was then used to present a range of revenues for bluefin tuna and target species landings for pelagic longline vessels. This range was derived from the predicted range of total catch, including catches from within the Spring Gulf of Mexico Gear Restricted Area and from the open area of the Gulf of Mexico. Revenue ranges for bluefin tuna and target species were interpreted to discuss the socioeconomic impacts.

Table 4.25 Predicted Pelagic Longline Catch Ranges and Average Annual Revenue Ranges for Bluefin and Target Species for the Spring Gulf of Mexico Gear Restricted Area in April–May

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept
Average annual catch in 2015–2018	576	4	1,317	12	121
Predicted range of catch	402–490	3–7	1,160–1,462	12–33	81–176
Percent change from 2015–2018 catch to predicted catch (%)	-30 to -15	-25 to +75	-12 to +11	0 to +175	-33 to +45
Average annual revenue in 2015–2018	$308,959	$10,731	$348,227	$5,068	$4,022
Predicted range of average annual revenue	$215,628-$262,830	$8,048-$18,779	$306,715-$386,567	$5,068-$13,936	$2,692-$5,850

Total average annual revenue for bluefin tuna and target species in April and May of 2015 through 2018 was $677,007 (Table 4.25). The predicted range of total average annual revenue with performance based access would be $538,151 to $687,962. Revenue from some species is predicted to decrease during these two months, particularly for swordfish. Revenue from bigeye tuna, on the other hand, is predicted to remain the same or increase. Overall socioeconomic impacts for this alternative are expected to range from neutral to minor beneficial in the short-term, despite the predicted decrease in overall revenue at the low end. Fishermen will make decisions about where to fish in any given year depending on fish availability. Access to the Spring Gulf of Mexico Gear Restricted Area will provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch.

Long-term impacts on these species would depend on future trends in performance based access to the Spring Gulf of Mexico Gear Restricted Area. If the number of vessels allowed access to these areas remains consistent over time, long-term impacts would be expected to be the same as short-term impacts. As described above, this analysis assumes that all vessels with Gulf of Mexico IBQ shares would have access to the Spring Gulf of Mexico Gear Restricted Area. There could be a slight decrease in revenues within the Spring Gulf of Mexico Gear Restricted Area from the values

described here, with a corresponding increase in revenues in the open area, due to vessels excluded from the areas, but the predicted ranges of catch still represent the best estimate for the area.

Conclusion

This alternative balances the objective to optimize the ability of the pelagic longline fleet to harvest target species quotas against the objective of continuing to minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS. The majority of the fleet that fishes in the Gulf of Mexico would be allowed into the area, and those participants would still be held individually accountable under the IBQ Program for bluefin tuna interactions. However, since the majority of vessels fishing in the Gulf of Mexico would be expected to have access to the Spring Gulf of Mexico Gear Restricted Area under this alternative, any benefit to applying performance-based access would likely be minimal. There is also some question as to the ability of this alternative to incentivize fleet-wide reductions in bluefin tuna interactions, especially if vessels are fishing elsewhere or under separate regulations (i.e. the NED). This alternative does not present much difference in ecological or socioeconomic impacts from opening these areas as Monitoring Areas (Alternative C3) or eliminating the Spring Gulf of Mexico Gear Restricted Area (Alternative C4). To meet the objective of optimizing the ability of the fleet to harvest target species, this alternative would *add* additional, somewhat complicated regulations to the area instead of streamlining and simplifying regulations. Therefore, this alternative is not strongly aligned with the objective to streamline and simplifying HMS regulations. For these reasons, NMFS does not prefer this alternative at this time.

4.3.3 Alternative C3: Undertake a review process to evaluate the continued need for the Spring Gulf of Mexico Gear Restricted Areas (Preferred Alternative)

This alternative is similar in concept to Alternative A4 above. This alternative would convert the "Spring Gulf of Mexico Gear Restricted Area" to a monitoring area called the "Spring Gulf of Mexico Monitoring Area," and establish a three-year evaluation period during which fishing would be allowed in the Monitoring Areas. The reasons for establishing the gear restricted areas are discussed above in Alternative C1. Fishing activity would be closely monitored by the NMFS under a four-step process (Figure 4.15) that would prohibit fishing if the fleet had to use an excessive amount of IBQ allocation to account for bluefin landings or dead discards. The Monitoring Areas would be managed as follows:

—The Monitoring Areas would initially remain open to pelagic longline fishing from April 1 to May 31 (Step 1, Figure 4.15).

—There would be an annual 63,150 pound IBQ allocation threshold for landings and dead discards of bluefin caught within the Monitoring Areas. This threshold is equivalent to approximately 55 percent of the total amount of Gulf of Mexico IBQ annual allocation issued to the fleet in 2018. In the event that the U.S. allocation of bluefin quota is adjusted downward by ICCAT, the threshold would be equivalent to 55 percent of the adjusted total Gulf of Mexico IBQ allocation disbursed to the fleet.

—If the threshold is reached, or is projected to be reached, NMFS would file a closure notice for the Monitoring Areas with the Office of the Federal Register (Step 2, Figure 4.15).

—On and after the effective date of the notice, the Monitoring Areas would be closed to pelagic longline fishing each year from April 1 through May 31, unless NMFS takes further action.

—If no closure notice is filed between April 1, 2020 and December 31, 2022, the Monitoring Areas would remain open (Step 2, Figure 4.15), unless and until NMFS decides to take additional action. The area would be closely monitored by NMFS under a process that would prohibit fishing if the fleet were to use IBQ allocation in exceedance of an established annual threshold to account for bluefin landings or dead discards caught within the boundaries of the Monitoring Areas. The 63,150 lb threshold is based on the amount of IBQ annual allocation distributed to vessels that fished in the region while the closures were effective between 2015 and 2017. In the event that the U.S. allocation of bluefin quota was adjusted downward by ICCAT, the threshold would be equivalent to 55% of the adjusted total Gulf of Mexico IBQ allocation disbursed to the fleet. This threshold would limit the amount of IBQ that could be used to account for bluefin landings and dead discards in the monitoring areas to the amount of IBQ allocation that could be used by the portion of the fleet that was recently (2015 through 2017) active during these months in the Gulf of Mexico. Since fishing effort in the Gulf of Mexico is already controlled in the IBQ Program through regional IBQ quota category designations, the impacts from this alternative would primarily come from the Gulf of Mexico fleet. The intent of this threshold design is to discourage a level of fishing beyond what has recently occurred in the Gulf of Mexico. Basing the threshold for closure on the annual allocation of active vessels from 2015 to 2017 would allow pelagic longline vessels to continue fishing in the same manner as they have in the past three years, and have a threshold level that provides sufficient opportunities for fishermen to target swordfish and yellowfin and bigeye tunas while the Monitoring Areas are effective. After the 2020-2022 evaluation period, NMFS will evaluate data collected from the Monitoring Areas and compile a report (Step 3, Figure 4.15). Based on the findings of the report, NMFS may then decide to initiate a follow-up action to implement new, longer-term management measures for the areas (Step 4, Figure 4.15).

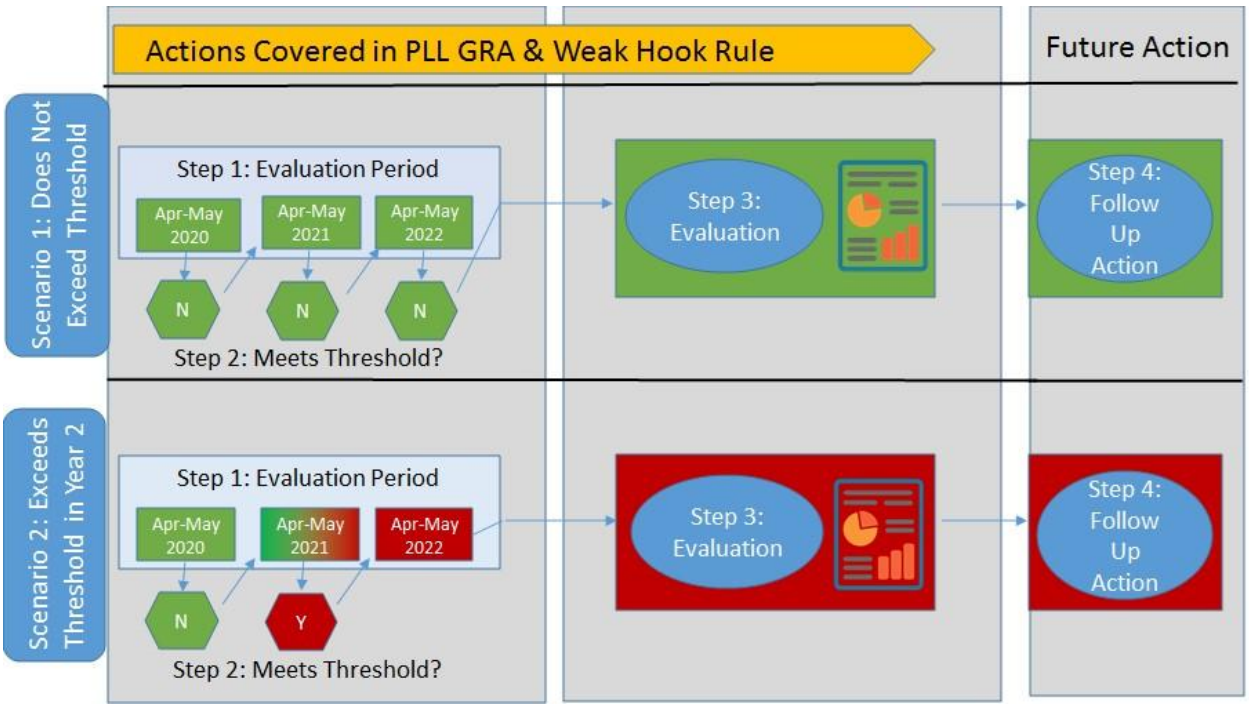

Figure 4.15 Two Scenarios Depicting the Evaluation Process for the Spring Gulf of Mexico Monitoring Area

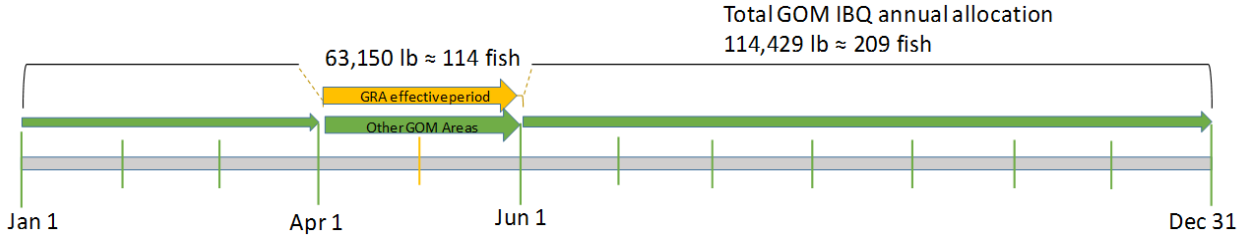

Figure 4.16 Threshold for the Spring Gulf of Mexico Pelagic Longline Monitoring Area Equivalent to the Annual Allocation Issued to Vessels that Fished During the Months of April and May from 2015 through 2017

Ecological Impacts on Bluefin Tuna and Target Species

The predicted effort that will occur in the Monitoring Areas was estimated using the same methods described in Alternative C2 above (see Table 4.22). In total, 386,371 hooks were fished in the Gulf of Mexico by the pelagic longline fleet in April and May between 2012 and 2014. Of these, approximately 37 percent (142,757 hooks) of hooks were deployed in the boundaries of what would become the Monitoring Areas. Assuming the same distribution of effort would occur if fishing was allowed in Monitoring Areas, it is reasonable to anticipate that approximately 62,721 hooks may be deployed within the Monitoring Areas in a given year. Both historical and current effort numbers were annualized (Table 4.22).

As discussed above in Alternative C2 and shown in Table 4.22, NMFS used fleet-wide CPUE for both the month prior (March) and the month after (June) the Gear Restricted Areas are in place to predict CPUE and interaction numbers for the months of April and May. The CPUEs for both months provide a range of interactions that may be expected to occur during the months of April and May. The CPUE for March and June were derived from pelagic longline sets within the area of the Spring Gulf of Mexico Gear Restricted Area in 2015 through 2018, which provide the best available data for the Gear Restricted Area.

The short-term direct ecological impacts on bluefin tuna and target species as a result of the preferred alternative are likely to be neutral, as the range of interactions estimated is comparable to current interactions under the No Action alternative (C1), with the exception of a predicted lower number of swordfish kept (Table 4.23). Additionally, the threshold established under this alternative limits the amount of bluefin tuna catch during this time period without closing the Monitoring Areas. The threshold limits fishermen to the total amount of IBQ allocation issued to vessels that fished during the months of April and May, discouraging these fishermen from concentrating a year's worth of effort into the Monitoring Areas while it is effective. However, if they hit the threshold, Gulf of Mexico pelagic longline fishermen would still have IBQ available to continue fishing even if the threshold is met and the Monitoring Area closes. Any additional bluefin tuna interactions accrued on top of this threshold could still be accounted for under the sustainable quota established for Gulf of Mexico bluefin tuna under Amendment 7. This further underscores the neutral impact that this alternative would have on bluefin tuna.

Regarding the effects of this alternative specifically on spawning bluefin tuna, the alternative could slightly increase incidental catch of spawning bluefin tuna compared to the No Action alternative given the months of the current gear restricted area. The estimated number of bluefin tuna expected to be kept and discarded under the No Action Alternative is 4 and 5 fish per year, respectively. The estimated range under the Preferred Alternative would be 3 to 7 fish per year (kept) and 5 to 7 fish per year (discarded) (Table 4.23). Any such increases would be within previously analyzed, applicable quotas and would be consistent with other management measures that NMFS adopted to appropriately limit bycatch and conserve the stock in Amendment 7, including, for example the Longline subquota and the IBQ allocation provisions.

In establishing the Spring Gulf of Mexico Gear Restricted Area in Amendment 7, NMFS had stated that because bluefin tuna in the Gulf of Mexico are comprised of large fish that are sexually mature and/or spawning, reducing interactions with pelagic longline gear in the Gulf of Mexico "may also enhance spawning potential and stock growth." This objective, however, was not the primary reason for establishing the area. The Spring Gulf of Mexico Gear Restricted Area was implemented primarily to complement the IBQ Program in keeping the Longline fishery to an incidental category within limits established in Amendment 7. The specific time and areas of the Spring Gulf of Mexico Gear Restricted Area were selected to reduce bluefin interactions based on past patterns of interactions by the pelagic longline fishery. During the development of Amendment 7, this area was identified to have high numbers of bluefin tuna interactions with pelagic longline gear. Amendment 7 closed this area to pelagic longline gear use from April 1 to May 31 to reduce those interactions and decrease the potential for dead discards. Amendment 7 undertook several measures to appropriately limit incidental catch of bluefin tuna in the pelagic longline fishery and to provide strong incentives for vessels to avoid bluefin tuna interactions and thus reduce bluefin dead discards. The IBQ Program, along with the Cape Hatteras and Spring Gulf of Mexico Gear Restricted Area, was intended to help achieve reductions to help the category remain within levels established in Amendment 7, consistent with objectives including minimizing bycatch and the need to stay within overall, science-based quotas.

Amendment 7 developed a separate IBQ share category and IBQ allocation limits for vessels fishing in the Gulf of Mexico. The preferred subalternative in Amendment 7 (C 2b.4) analyzed the separate IBQ share category for the Gulf of Mexico, which is equivalent to 35 percent of the Longline category subquota. NMFS determined that regional designation of quota at this level would continue to enhance spawning potential and stock growth and result in minor beneficial impacts to bluefin tuna (See Section 2.3.2 of the Amendment 7 FEIS). Furthermore, the analyses in the final Three-Year Review indicate that the IBQ Program has had effects that met or exceeded the conservation and management objectives established in Amendment 7. Since implementation of the IBQ Program in the pelagic longline fishery, only between 9 and 18 percent of the available Gulf of Mexico IBQ allocation has been used between 2015 and 2018. (These percentages were derived from Table 3.2, 3.4, and 6.4-6.8 of the final Three-Year Review.) Given this low level of IBQ usage the Spring Gulf of Mexico Gear Restricted Area and the fact that overall quota use for the bluefin tuna fishery remains well within the previously adopted, science-based quotas established at ICCAT, the continuation of the gear restricted area may not be necessary to continue to manage incidental catch and enhance spawning potential and stock growth. Further information will be gained from data collection from the area will occur during the evaluative period.

As described under Alternative C2, access to the Spring Gulf of Mexico Monitoring Area will give fishermen the opportunity to make decisions about where to fish depending on fish availability, and the flexibility to fish in areas that optimize target catch while minimizing bycatch. If swordfish and yellowfin tuna landings in the Gulf of Mexico decrease due to shifting effort into the Monitoring Areas, as predicted in this analysis, then fishermen would likely remain outside of the areas, maintaining neutral ecological impacts to those species.

Assuming that the estimated numbers of fish shown in Table 4.23 are equivalent to the size of an average landed bluefin tuna in the Gulf of Mexico (~551 lb), the predicted range of bluefin tuna kept and discarded under this alternative (3 to 7 fish per year (kept) and 5 to 7 fish per year (discarded)) is well below the threshold of 63,150 lb (equivalent to approximately 114 fish) set for the Spring Gulf of Mexico Monitoring Area. Therefore, the Monitoring Areas would not be expected to close during the three-year evaluation period, and no changes to short-term impacts would be expected.

Table 3.35 in Amendment 7, the annual average of bluefin tuna interactions that were occurring before implementation of the Spring Gulf of Mexico Gear Restricted Area (i.e., 2006 through 2012) was 118. This average was derived by not including the data from 2011 due to limited fishing from restrictions resulting from the Deepwater Horizon oil spill, and rounding up to the nearest whole fish. Thus, the threshold level of 114 dead discards or landings for the Monitoring Areas could be considered more restrictive than the level of bluefin tuna mortality that was occurring in Spring Gulf of Mexico Gear Restricted Area before implementation.

Fixed gear restricted areas and time/area closures are not responsive to changes in distribution or local abundance of bluefin tuna that may occur. For example, in Amendment 7, from proposed to final, the preferred alternative changed regarding the creation of a gear restricted area in the Gulf of Mexico as data from additional years became available showing increasing catch rates farther east than where the originally preferred small gear restricted area was located and lower catch rates in the area of the originally preferred small gear restricted area. The result of that change is the two boxes of the current Gulf of Mexico gear restricted area. It is reasonable to expect continued fluctuations in local abundance of fish from area to area across the ocean as bluefin tuna (or any species) move in search of food or in response to habitat preferences or life cycle. The IBQ Program

was designed to provide individual vessel accountability for bluefin tuna catch (landings and dead discards) and incentivize the pelagic longline fishery to minimize interactions with bluefin tuna. These characteristics of a successful IBQ program have been observed in the Atlantic pelagic longline fishery and allow for some regulatory flexibility to allow fishermen to adapt to changes in the behavior and local abundance of fish. Thus, fishermen are incentivized to and would be able to move fishing gear more easily to avoid bluefin tuna bycatch. Having the ability to fish in the Gulf of Mexico Monitoring Area would allow fishermen more ability to move as needed to avoid bluefin tuna bycatch.

Long-term impacts on bluefin tuna and target species would depend on the result of the three-year evaluation period for these Monitoring Areas. If these areas remain open after three years, long-term impacts during the Evaluation Period (Step 3 in Figure 4.15 above) would be expected to be the same as short-term impacts (i.e., neutral) because the fishery would still be managed under the IBQ Program (i.e., identical fishery and management conditions as during the Monitoring Period). If the Monitoring Areas were closed due to a threshold being hit, they would remain closed during the Evaluation Period. In this instance, the long-term ecological impacts on bluefin tuna and target species would likely be identical to the no action alternative, because the fishery conditions would revert back to status quo.

Ecological Impacts on Restricted and Protected Species

The same methods and data for estimating restricted and protected species interactions were used as presented above under Alternative C2 for impacts to bluefin tuna and pelagic longline target species, including effort estimates (Table 4.24). Current discards of blue marlin, white marlin, and sailfish from the open area of the Gulf of Mexico fall within the range of predicted discards under this alternative, so short-term, indirect impacts to these species are anticipated to be neutral. Shortfin mako shark interactions and dusky shark discards would decrease, resulting in short-term, indirect, minor, beneficial impacts. Sea turtle interactions would remain the same under this alternative, resulting in short-term, indirect, neutral, impacts. Long-term impacts on these species would depend on the result of the three-year evaluation period for these Monitoring Areas. If these areas remain open after three years, long-term impacts would be expected to be the same as short-term impacts.

Socioeconomic Impacts

Overall socioeconomic impacts for this alternative are expected to be neutral to minor beneficial in the short-term, for the same reasons as in Alternative C2 (Table 4.25). Fishermen will make decisions about where to fish in any given year depending on fish availability and will likely decide not to fish in the Spring Gulf of Mexico Monitoring Areas if they discover it lowers their fishing revenue. These Monitoring Areas will provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch.

Long-term socioeconomic impacts would depend on the result of the three-year evaluation period for these Monitoring Areas. If these areas remain open after three years, long-term impacts would be expected to be the same as short-term impacts.

Conclusion

This alternative is consistent with the objective of optimizing the ability of the pelagic longline fleet to harvest target species quotas, because it provides a carefully controlled mechanism to allow fishermen back into areas that were previously closed. This alternative also helps with the uncertainty due to lack of data from within the gear restricted areas as to whether they are still appropriately located or needed to meet bluefin tuna management objectives. This alternative gives fishermen the flexibility to determine where in the Gulf of Mexico they choose to fish to optimize target catch. This alternative would also be expected to have neutral ecological impacts on bluefin tuna, as it provides measures to minimize bluefin tuna bycatch via the threshold and evaluative aspects of the program. It should allow the pelagic longline fishery to continue fishing throughout the year in a manner they have in the past four years (2015-2018), and have a threshold level that provides both sufficient opportunities for fishermen to target swordfish, yellowfin tuna, bigeye tuna, as well as other pelagic species, and limits excessive interactions with bluefin tuna while the Monitoring Area is effective. The individual accountability aspects of the IBQ Program would still be relied upon to incentivize bluefin tuna avoidance, meaning that there is still a proven means to achieve the objectives of continuing to minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS. In addition, this alternative simplifies and streamlines regulations in the Gulf of Mexico intended to reduce interactions with and incidental catch of bluefin tuna, and is therefore consistent with that corresponding objective for this rulemaking. For these reasons, NMFS prefers this alternative at this time.

4.3.4 Alternative C4: Eliminate the Spring Gulf of Mexico Gear Restricted Area

This alternative would remove the Spring Gulf of Mexico Gear Restricted Area as currently defined at §635.2 and all associated regulatory provisions, restrictions, and prohibitions.

Ecological Impacts on Bluefin Tuna and Target Species

Since this alternative would allow access to all vessels with Gulf of Mexico IBQ shares or allocation by removing regulations related to the Spring Gulf of Mexico Gear Restricted Area, the short-term impacts to bluefin tuna and target species would be the same as presented in the preferred alternative (Alternative C3, see Table 4.23). The short-term direct ecological impacts on bluefin tuna as a result of the preferred alternative are likely to be neutral, as the range of catch estimated is comparable to current catches under the No Action alternative (C1, Table 4.19). Additionally, catch of bluefin tuna is limited to the amount of IBQ available to pelagic longline vessels for the Gulf of Mexico, which was set at a sustainable level under Amendment 7, further underscoring the neutral impact that this alternative would have on bluefin tuna. The short-term direct ecological impacts on target species as a result of the preferred alternative are also likely to be neutral (Table 4.23). Current interactions of target species from the open area of the Gulf of Mexico fall within the range of predicted interactions, with the exception of a predicted lower number of swordfish kept. As described under the socioeconomic impacts in the preferred alternative, access to the Spring Gulf of Mexico Monitoring Areas will give fishermen the opportunity to make decisions about where to fish depending on fish availability, and the flexibility to fish in areas that optimize target catch while minimizing bycatch. If swordfish and yellowfin tuna landings in the Gulf of Mexico decrease due to shifting effort into the Monitoring Areas, as predicted in this analysis, then fishermen would likely remain outside of the areas, maintaining neutral ecological impacts to those species.

As described, adverse impacts to bluefin tuna or target species are not predicted as a result of this alternative. However, this alternative does not have the opportunity for monitoring and evaluation of impacts provided by either Alternative C2 or C3. Therefore, while long-term direct ecological

impacts on bluefin tuna would be expected to be neutral, there is more uncertainty than for other alternatives.

Ecological Impacts on Restricted and Protected Species

Since this alternative would allow access to all vessels with Gulf of Mexico IBQ shares or allocation by removing regulations related to the Spring Gulf of Mexico Gear Restricted Area, the short-term impacts to restricted and protected species would be the same as presented in the preferred alternative (Alternative C3, see Table 4.24). Compared to the No Action alternative (C1), the range of white marlin and blue marlin discards are predicted to decrease or increase under this alternative, while the range sailfish discards would decrease slightly or increase. This alternative would result in short-term indirect minor beneficial to minor adverse impacts to marlins and sailfish. Shortfin mako shark interactions and dusky shark discards would decrease, resulting in short-term indirect minor beneficial impacts. Sea turtle interactions would remain the same under this alternative, resulting in short-term, indirect, neutral impacts. Long-term impacts on these species would be expected to be the same as short-term impacts.

Socioeconomic Impacts

Since this alternative would allow access to all vessels with IBQ from the Gulf of Mexico by removing regulations related to the Spring Gulf of Mexico Gear Restricted Area, the short-term socioeconomic impacts would be the same as presented in the preferred alternative (Alternative C3, see Table 4.25). Total average annual revenue for bluefin tuna and target species in April and May of 2015 through 2018 was $677,007. The predicted range of total average annual revenue under this alternative would be $538,151 to $687,962. Revenue from some species is predicted to decrease during these two months, particularly for swordfish. Revenue from bigeye tuna, on the other hand, is predicted to remain the same or increase. Overall socioeconomic impacts for this alternative are expected to be neutral to minor beneficial in the short-term. Fishermen will make decisions about where to fish in any given year depending on fish availability. Elimination of these areas will provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. Long-term socioeconomic impacts would be expected to be the same as short-term impacts.

Conclusion

Although this alternative gives fishermen the most flexibility to determine where in the Gulf of Mexico they choose to fish to optimize target catch and minimize bycatch under the IBQ Program, and although this alternative would be expected to have neutral ecological impacts on bluefin tuna, this alternative does not have the agency control provided by performance access in Alternative C2 or by the monitoring aspects of the evaluation process in Alternative C3, resulting in more uncertainty in the long-term. For these reasons, NMFS does not prefer this alternative at this time.

4.4 Gulf of Mexico Weak Hook Alternatives

NMFS is considering and analyzing the following range of alternatives concerning use of weak hooks in the Gulf of Mexico pelagic longline fishery. Weak hooks were initially implemented as part of a bycatch management strategy for bluefin tuna. There is a particularly high degree of interest in protecting spawning bluefin tuna in the Gulf of Mexico because the Gulf of Mexico is recognized as

the primary spawning grounds for western Atlantic bluefin tuna. NMFS selected the same preferred alternative in both the DEIS and the FEIS.

During scoping for this rulemaking, NMFS received comments both in favor and opposed to relieving the weak hook restrictions. Pelagic longline fishermen have suggested that the mandatory, year-round use of weak hooks in the Gulf of Mexico may no longer be needed to limit bluefin tuna bycatch given the apparent effectiveness of the IBQ Program and the seasonal distribution of bluefin tuna. Some fishermen feel that the use of weak hooks has resulted in lower catches of targeted fish such as large swordfish.

During the public comment period for the proposed rule and the DEIS, NMFS received comments both in favor and opposed to relieving weak hook restrictions, with the majority of commenters (by number of comments submitted) in favor of a seasonal application of weak hook requirements from January through June of a given year. Some commenters also suggested spatial variations of weak hook requirements that would specifically require or exempt specific areas from weak hook use. In general, the public continues to acknowledge a significant conservation benefit of weak hooks (Appendix B).

Alternatives analyzed in this FEIS include:

Alternative D1: No Action. Maintain the current requirement for HMS pelagic longline fishermen to use weak hooks year-round when operating in the Gulf of Mexico

Alternative D2: Seasonal requirement for weak hooks. (Preferred Alternative)

Alternative D3: Remove the weak hook requirement.

4.4.1 Alternative D1: No Action. Maintain weak hook requirements in the Gulf of Mexico

Under Alternative D1, NMFS would maintain the regulations currently at 50 CFR Part § 635.21(c)(5)(iii)(B)(2)(*i*) requiring vessels fishing in the Gulf of Mexico, as defined at 50 CFR 600.105(c), that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic Ocean, including the Caribbean Sea and the Gulf of Mexico, to use weak hooks year-round when operating in the Gulf of Mexico.

Ecological Impacts on Bluefin Tuna and Target Species

Under Alternative D1, NMFS would not make any changes to the year-round pelagic longline weak hook requirement in the Gulf of Mexico. Weak hooks are hooks made of a thinner gauge wire that can straighten and release large fish when they are captured. In 2011, NMFS implemented the requirement for all HMS pelagic longline fishermen to use weak hooks when operating in the Gulf of Mexico to reduce the catch of bluefin tuna. The rule was implemented rapidly to protect a large year class of bluefin tuna that was approaching maturity and expected to enter the Gulf of Mexico to spawn for the first time (76 FR 18653; April 5, 2011). Weak hooks can allow incidentally hooked bluefin tuna to escape capture because the hooks are more likely to straighten when a large fish is hooked, thus releasing the fish. Research results showed that the use of weak hooks can significantly reduce the amount of bluefin tuna caught by pelagic longline vessels (Appendix B).

NMFS recently updated an analysis of the impacts of weak hooks on pelagic longline landings and CPUE of select target Atlantic HMS (e.g., swordfish, yellowfin tuna, bigeye tuna) and of discarded Atlantic HMS (e.g., undersized swordfish, blue marlin, white marlin) in the 2018 Atlantic HMS SAFE report (Table 3.4). Enhanced survival of spawners from the 2011 year class were hypothesized in the rule that implemented weak hooks, implying that the use of weak hooks could improve spawning success and size of subsequent year classes, ultimately increasing stock biomass. These benefits might continue under a no action alternative.

Since the implementation of weak hooks in 2011, NMFS has adopted a number of new regulations that affect the fishery. A comprehensive bycatch management program, the IBQ Program, issues individual quota (IBQ allocation) to IBQ shareholders which must be used to account for landings and dead discards of bluefin tuna. NMFS has also implemented gear restricted areas (the "Spring Gulf of Mexico Gear Restricted Areas", see Section 4.3 for alternatives pertaining to this area). Under Alternative D1, NMFS would continue to require the use of weak hooks with no change. By itself, this alternative would not change the current management structure in the Gulf of Mexico. Short- and long-term direct ecological impacts would likely be neutral under Alternative D1 because landings, discards, and CPUE of bluefin tuna and select target species are anticipated to remain unchanged from those presented in Table 3.4.

Ecological Impacts on Restricted and Protected Species

Weak hooks have varying impacts on restricted species, according to research conducted by the SEFSC (results summarized in Appendix B). Research conducted by NMFS from 2008-2012 (which included data collection after initial implementation of the weak hook requirement) indicated that catch rates of white marlin and roundscale spearfish were nearly 46 percent higher with weak hooks compared to the stronger circle hooks that had been allowed in the fishery, and the increased catch rates were statistically significant.

Although not statistically significant, the research observed an approximately 1 percent reduction in the number of blue marlin and an approximately 23 percent reduction in sailfish that were captured in experiments evaluating the use of weak hooks in the Gulf of Mexico pelagic longline fishery. Alternative D1, which would retain the weak hook requirements for the pelagic longline fishery, might facilitate the removal of fishing gear from large individuals of some restricted species. Therefore, there may be some minor benefits to retaining the weak hook restrictions due to an increase in post-hooking survival of larger fish that exert enough force to straighten the hooks prior to being caught incidentally to target fishing operations. However, ecological impacts on these restricted species are likely neutral given that (1) results from research conducted by the SEFSC on these species were not statistically significant at the 95 percent confidence level (Appendix B), and (2) retaining the measure would likely not result in a change in the amount of effort, consequent rate of incidental interactions, or discards of blue marlin, white marlin, sailfish, or swordfish (see Table 3.4). In contrast, adverse ecological impacts to white marlin and roundscale spearfish would be expected to continue under this alternative due to mandatory use of weak hooks. The NMFS weak hook study did not find any statistically significant impacts to dusky or shortfin mako sharks.

Regarding protected resources, this alternative would maintain existing possession and use requirements for bycatch mitigation gear, as well as protected species safe handling and release training and guidelines as currently specified by NMFS. The bycatch mitigation gear requirements and protected species safe handling and release training and guidelines were implemented to reduce bycatch and bycatch mortality of incidentally captured sea turtles, marine mammals, and other incidentally captured species and were thoroughly analyzed in the Final Environmental

Impact Statement for the 2006 Consolidated HMS FMP. Pelagic longline fishermen would still be required to abide by the circle hook requirements established under the 2004 BiOp for the purpose of mitigating sea turtle bycatch and bycatch mortality (possession and use of corrodible, i.e., non-stainless steel, 18/0 or larger circle hooks with an offset not to exceed 10 degrees, or 16/0 or larger non-offset circle hooks). Anecdotal reports from scientists that conducted the weak hook study indicated that the weak hook was easier to dislodge from incidentally captured/foul hooked leatherback sea turtles than the current, required standard circle hook. However, the weak hook research conducted in the Gulf of Mexico did not produce a large enough sample size to assess the impacts of weak hooks on sea turtles or other protected species. Since retaining the measure would likely not result in a change in the amount of effort or consequent rate of incidental interactions, or change the regulatory environment, NMFS anticipates the ecological impacts on protected species would be neutral.

Socioeconomic Impacts

Under Alternative D1, pelagic longline fishermen would continue to operate under the same regulations. Since there would be no change in the regulatory environment, the distribution of effort and the amount of effort is anticipated to remain the same. Therefore, short- and long-term direct and indirect socioeconomic impacts are anticipated to be neutral.

Weak hook research conducted by NMFS from 2008-2012 indicated that there was no statistically significant difference (at the 95 percent confidence level) in the catch rates of most targeted species when compared to previously allowed stronger circle hooks (Appendix B). This is in contrast to comments NMFS has received from pelagic longline fishermen expressing concern about their perception that swordfish catches have been reduced with weak hooks. Other alternatives were designed to offer fishermen additional flexibility to choose a stronger circle hook (consistent with other existing requirements for hook size and type) that they feel may work better for their fishing operations, while still meeting the management and conservation goals for bluefin tuna.

Conclusion

The No Action alternative meets the objective of continuing to minimize bluefin tuna mortality, however, it is not as closely aligned with other objectives of the rulemaking (i.e., to optimize the ability of the longline fleet to harvest target quotas, and reduce functionally redundant regulations). Research by the SEFSC (see summary at Appendix B) shows that use of weak hooks may increase catch-per-unit effort of white marlin, which is not compatible with the objective of reducing bycatch and bycatch mortality of other Atlantic HMS. Alternative D1 would continue to provide ecological benefits to bluefin tuna; however, it would also continue to adversely impact white marlin and roundscale spearfish. In the Final Environmental Assessment for implementation of the weak hook requirement in 2011, NMFS said that it would continue to closely monitor fleet activities and catch statistics and if additional research showed a statistically significant increase in bycatch, NMFS would consider making management measure adjustments such as seasonal application of the weak hook requirement or other modifications. Because an adjustment to the regulations to mitigate the adverse impacts to white marlin and roundscale spearfish is justified and seasonal application of the weak hook requirement to protect bluefin tuna from January through June when they are most abundant in the Gulf of Mexico is still needed, NMFS does not prefer Alternative D1 at this time.

4.4.2 Alternative D2: Seasonal Requirement for Weak Hooks

This alternative would modify regulations to require vessels fishing in the Gulf of Mexico, as defined at 50 CFR 105(c), that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic Ocean, including the Caribbean Sea and the Gulf of Mexico to use weak hooks when bluefin tuna are highest in abundance from January through June. This requirement coincides with their spawning season, which is from April to June. Fishermen may voluntarily choose to continue to use weak hooks when they are not required.

Ecological Impacts on Bluefin Tuna and Target Species

Alternative D2 would modify the pelagic longline weak hook requirement in the Gulf of Mexico by limiting it to January through June of each year to coincide with the highest abundance (Figure 4.17; this figure has been updated from the DEIS through the inclusion of an additional year of data (2018)) and catch-per-unit effort (Figure 4.18; this figure has been updated from the DEIS through the inclusion of an additional year of data (2018)) of bluefin tuna. The year-round requirement to use weak hooks in the HMS pelagic longline fishery was initially implemented to reduce the catch of bluefin tuna and protect a large cohort expected to mature into the spawning stock in 2011. The weak hook requirement was complemented in 2015 by implementation of the IBQ Program in Amendment 7. The IBQ Program has incentivized bluefin tuna avoidance among pelagic longline fleet participants, and restrained bluefin tuna landings and dead discards well within the Longline category quota allotted to fishery participants in the Gulf of Mexico. If weak hook requirements were relaxed for half of the calendar year, the IBQ Program would still effectively limit bluefin tuna mortality through an individual cap on the total number of landings and dead discards. The IBQ Program provides a hard limit on bluefin tuna fishing mortality, and in some cases, the weak hook requirement may have assisted fishermen to operate within IBQ Program limits by reducing their catch of bluefin tuna. The patterns of interactions by month has remained similar over time with more interactions happening from January through June than in the second half of the year (Figure 4.17).

Furthermore, NMFS recently updated an analysis of pelagic longline landings and CPUE of select target Atlantic HMS (e.g., swordfish, yellowfin tuna, bigeye tuna) and of discarded Atlantic HMS (e.g., undersized swordfish, blue marlin, white marlin) before and after weak hook implementation in the 2018 Atlantic HMS SAFE report (Table 8.11). NMFS noted a 59.2 percent reduction in the average number of bluefin landings and a 51.7 percent reduction in bluefin discards in the Gulf of Mexico between a period prior to implementation (data spanning 2007 – 2010) and a period of time after implementation (2012 – 2017). These findings are consistent with previous research.

Alternative D2 is anticipated to have neutral short- and long-term direct ecological impacts to bluefin tuna because the weak hook requirement would remain in effect when they are most abundant in the Gulf of Mexico, and the IBQ Program would remain in place year round. The IBQ Program would continue to limit bluefin tuna mortality for bluefin tuna that have not departed the Gulf by the time the weak hook requirement is not in place from July through December. Alternative D2 is also anticipated to have neutral short- and long-term direct ecological impacts to target species such as swordfish and yellowfin tuna because there is no statistical difference in the catch rates for target species between weak hooks and the stronger circle hooks that fishermen used to use prior to 2011.

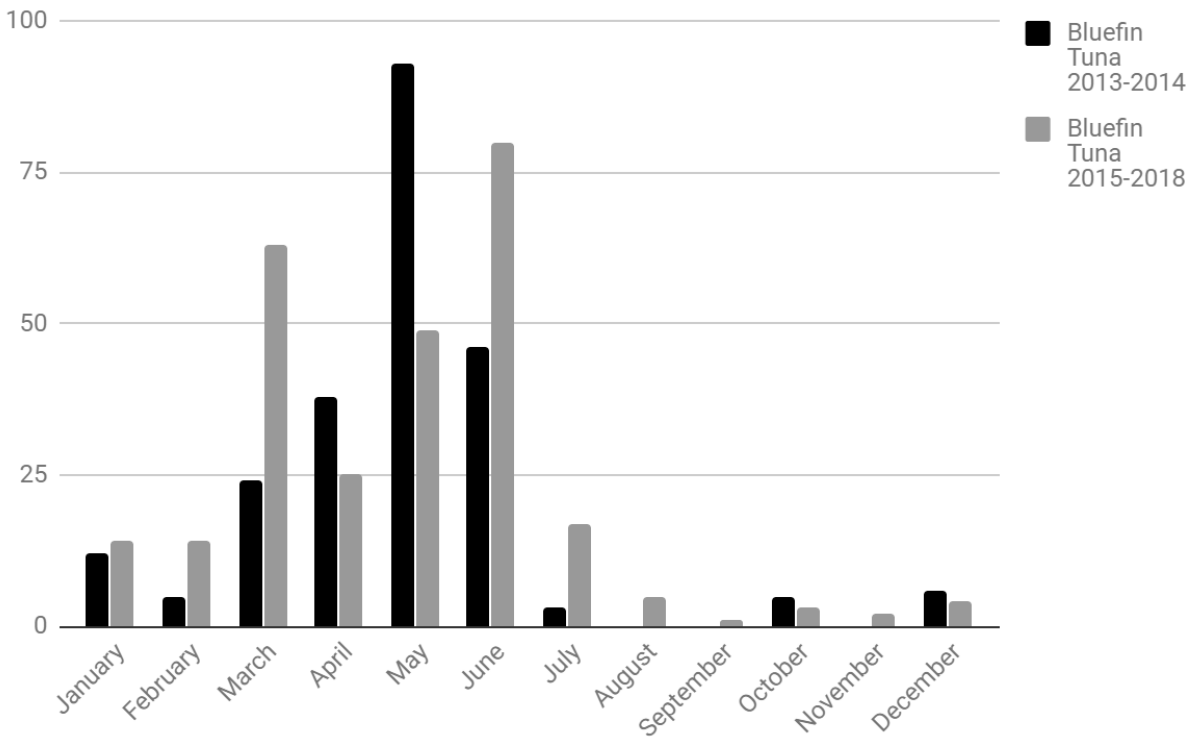

Figure 4.17 The Average Number of Bluefin Tuna Interactions per Month (y-axis) with the Pelagic Longline Fishery in the Gulf of Mexico EEZ and Adjacent High Seas

Source: HMS logbook data.

Ecological Impacts on Restricted and Protected Species

Compared to Alternative D1, Alternative D2 is expected to have less adverse impacts to two restricted species, white marlin and roundscale spearfish. Research conducted by NMFS from 2008-2012 (which included data collection after initial implementation of the weak hook requirement) indicated that catch rates of white marlin and roundscale spearfish were higher with weak hooks compared to the stronger circle hooks that had been allowed in the fishery and the increased catch rates were statistically significant.

Figure 4.18 shows the seasonal changes in CPUE for bluefin tuna and white marlin, and demonstrates the potential for seasonal application of the weak hook requirement. Alternative D2 would balance the benefits of the weak hook requirement for bluefin tuna with the need to mitigate adverse impacts for white marlin and roundscale spearfish by applying the weak hook requirement seasonally from January through June when bluefin tuna are most abundant in the Gulf of Mexico. Despite the potentially complementary benefits of the weak hook requirement and the IBQ Program for bluefin tuna, potentially adverse impacts of weak hook use on white marlin and roundscale spearfish may continue to occur between January and June as described under Alternative D1 above. From July through December each year, the weak hook requirement would not exist and fishermen could fish with the thicker gauge circle hooks that they used prior to 2011. Assuming they do so, Alternative D2 would likely result in deployment of fewer weak hooks in the second half of the year when the high catch rates of white marlin and roundscale spearfish are higher in the Gulf of Mexico (i.e., summer and fall), thus mitigating potential adverse impacts to these species. Alternative D2 is therefore anticipated to have positive ecological impacts to

restricted species by: (1) maintaining requirements that facilitate the removal of fishing gear on large animals in the first half of the year, which is expected to increase post-hooking survival of species caught incidentally to target fishing operations; and (2) reducing potential impacts on species that have been shown through scientific research to have statistically significant higher catches associated with weak hook use by not requiring weak hook in the second half of the year. The NMFS weak hook study did not find any statistically significant impacts to dusky or shortfin mako sharks.

Regarding protected resources, this alternative would maintain existing possession and use requirements for bycatch mitigation gear, as well as protected species safe handling and release training and guidelines as currently specified by NMFS. The bycatch mitigation gear requirements and protected species safe handling and release training and guidelines were implemented to reduce bycatch and bycatch mortality of incidentally captured sea turtles, marine mammals, and other incidentally captured species and were thoroughly analyzed in the FEIS for the 2006 Consolidated HMS FMP. Pelagic longline fishermen would still be required to abide by the circle hook requirements established under the 2004 BiOp for the purpose of mitigating sea turtle bycatch and bycatch mortality (possession and use of corrodible, i.e., non-stainless steel, 18/0 or larger circle hooks with an offset not to exceed 10 degrees, or 16/0 or larger non-offset circle hooks). As cited in the weak hook final rule, reports from scientists that conducted the weak hook research indicated that the weak hook was easier to dislodge from incidentally captured/foul hooked leatherback sea turtles than the current, required standard circle hook. However, the weak hook research conducted in the Gulf of Mexico did not produce a large enough sample size to assess the impacts of weak hooks on sea turtles or other protected species. Since retaining the measure would likely not result in a change in the amount of effort or consequent rate of incidental interactions, or change the regulatory environment, NMFS anticipates the ecological impacts on protected species would be neutral.

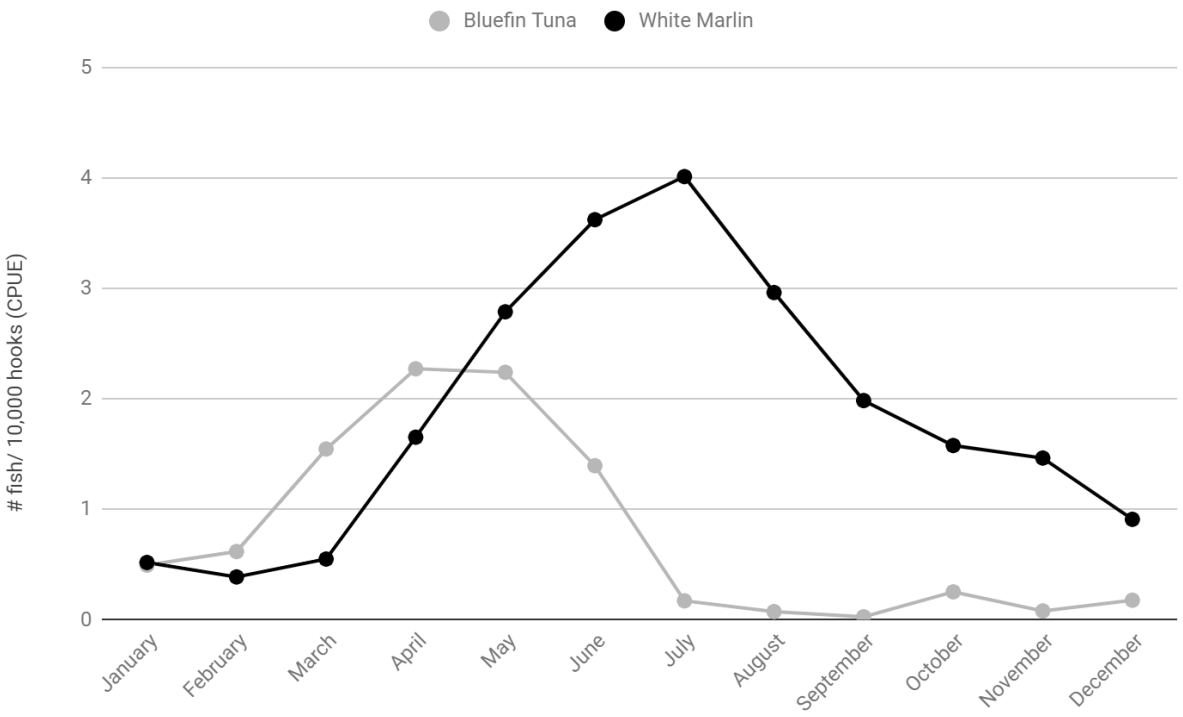

Figure 4.18 Bluefin and white marlin CPUE (# fish/10,000 hooks deployed) in the Gulf of Mexico (EEZ and high seas), 2011-2018

Source: HMS logbook data.

Socioeconomic Impacts

Under Alternative D2, fishermen would continue to operate under the current regulations for the first half of a given year, and then would be allowed to choose whether or not to deploy weak hooks on pelagic longline gear. This alternative would likely result in short- and long-term minor, beneficial socioeconomic impacts since it would give fishermen more flexibility in choosing how to fish. During the months without the weak hook requirement, fishermen could choose whether or not to use weak hooks based on their fishing operations. During the months when weak hook use is required, weak hooks are expected to reduce the number of captured bluefin tuna as previously analyzed in the rule implementing weak hooks. Use of weak hooks may help fishermen reduce IBQ allocation needed to cover incidental landings or dead discards, since the release of large fish shortly after hooking means that fishermen would not have to account for those fish (if they are never brought to boatside).

Short- and long-term indirect socioeconomic impacts to businesses that support fishing would likely be neutral or slightly positive. Changing pelagic longline weak hook requirements in the Gulf of Mexico is unlikely to change fishing effort, but could increase sales of stronger circle hooks in the short-term if fishermen buy non-weak hooks to use in the second half of the year.

Conclusion

This alternative is anticipated to have positive ecological impacts by maintaining weak hook requirements when bluefin tuna are present in the greatest abundance for spawning in the Gulf of

Mexico, but removing the requirement in the second half of the year when CPUE of species that may be more vulnerable to capture on weak hooks increases (i.e., white marlin). This alternative is therefore expected to strike the best balance between the objectives of continuing to minimize bluefin tuna mortality and maximize opportunity for the pelagic longline fishery to harvest target species. This alternative provides increased flexibility with respect to hook requirements in the second half of the year (provided basic circle hook requirements are still met). This alternative also balances the objective of reducing potentially redundant regulations against continuing to minimize bluefin tuna mortality by removing weak hook requirements in the second half of the year when weak hooks might not be needed as much to reduce interactions with spawning bluefin tuna. For these reasons, NMFS prefers this alternative at this time.

4.4.3 Alternative D3: Remove the weak hook requirement

This alternative would remove regulations that require vessels fishing in the Gulf of Mexico, as defined at 50 CFR 105(c), that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic Ocean, including the Caribbean Sea and the Gulf of Mexico to use weak hooks. NMFS would continue to encourage voluntary use of weak hooks in the Gulf of Mexico as a conservation strategy for bluefin tuna.

Ecological Impacts on Bluefin Tuna and Target Species

Under Alternative D3, NMFS would remove the pelagic longline weak hook requirement year-round in the Gulf of Mexico, but would encourage the voluntary use of weak hooks as a conservation strategy. In 2011, NMFS implemented the requirement for all HMS pelagic longline fishermen to use weak hooks when operating in the Gulf of Mexico in order to reduce the catch of bluefin tuna and the rule was implemented rapidly to protect a large year class of bluefin tuna that was approaching maturity and expected to enter the Gulf of Mexico to spawn for the first time (76 FR 18653; April 5, 2011). Weak hooks can allow incidentally hooked bluefin tuna to escape capture because the hooks are more likely to straighten when a large fish is hooked, thus releasing the fish. Statistically significant (at the 95 percent confidence level) research results showed that the use of weak hooks can reduce the amount of bluefin tuna caught by pelagic longline vessels by 46 percent (Appendix B). Enhanced survival of spawners from this year class were hypothesized in the rule which implemented weak hooks, implying that the use of weak hooks could improve spawning success and size of subsequent year classes, ultimately increasing stock biomass.

NMFS recently updated an analysis of pelagic longline landings and CPUE of select target Atlantic HMS (e.g., swordfish, yellowfin tuna, bigeye tuna) and of discarded Atlantic HMS (e.g., undersized swordfish, blue marlin, white marlin) before and after weak hook implementation in the 2018 Atlantic HMS SAFE report (Table 8.11). NMFS noted a 59.2 percent reduction in the average number of bluefin landings and a 51.7 percent reduction in bluefin discards in the Gulf of Mexico between a period prior to implementation (data spanning 2007 – 2010) and a period of time after implementation (2012 – 2017). These findings are consistent with previous research, however the weak hook requirement was also complemented in 2015 by implementation of the IBQ Program in Amendment 7. While removal of the requirement might mean that more bluefin tuna are brought to the vessel and increase mortality of bluefin tuna, the IBQ Program would still effectively limit bluefin tuna mortality through an individual cap on the total number of landings and dead discards. The IBQ Program regionally allocates quota to Gulf of Mexico and Atlantic fishermen, and has provisions in place to ensure that Atlantic IBQ allocation cannot be used to account for Gulf of Mexico bluefin mortalities. Furthermore, the Gulf of Mexico fleet has used very little of the total IBQ

allocated to cover the Gulf of Mexico bluefin tuna landings and dead discards from 2015 through 2017 (Table 3.16, Table 3.17). For example, preliminary data summarized and presented in the online IBQ System indicated that 7.7 percent, 13.7 percent, and 16.8 percent of the Gulf of Mexico IBQ allocation was caught in 2015, 2016, and 2017. If weak hooks reduced landings by 46 to 60 percent, the reductions estimated in the EA for weak hook implementation and in a recent analysis presented in the 2018 SAFE (Table 8.11) might double the required quota usage to account for bluefin landings and dead discards. However, even if this increase in landings and dead discards were to occur, the pelagic longline fleet would likely still remain within its designated quota due to individual accountability under the IBQ System and fishing effort is not anticipated to change as a result of modifying hook requirements. For these reasons, NMFS anticipates short- and long-term direct ecological impacts to bluefin tuna would likely be minor adverse to neutral.

Research conducted by the SEFSC suggests that weak hooks do not have a statistically significant effect at the 95 percent confidence level on target species catch (although reductions in catch are noted with their use both in research and by fishermen)(Appendix B). However, fishing mortality rates are unlikely to be affected. Selection of different types of hooks for use is not anticipated to change the distribution or amount of fishing effort. Therefore, short and long-term direct ecological impacts to target species such as swordfish and yellowfin tuna would likely be neutral under Alternative D3.

Ecological Impacts on Restricted and Protected Species

Weak hooks have varying impacts on restricted species, according to research conducted by the SEFSC (results summarized in Appendix B). Although not statistically significant, NMFS observed an approximately 1 percent reduction in the number of blue marlin and an approximately 23 percent reduction in sailfish that were captured in experiments evaluating the use of weak hooks in the Gulf of Mexico pelagic longline fishery. Therefore, removing the weak hook requirement might have some unquantifiable impact on these species, since exceptionally heavy individuals might be brought to the boat instead of being released prior to haulback. The potentially adverse impacts of weak hook use on white marlin and roundscale spearfish, as described under Alternative D1 and D2 above, could be minimized if fishermen choose to either not use weak hooks or use fewer weak hooks in the second half of the year when CPUE of these species is higher. Research conducted by NMFS from 2008-2012 (which included data collection after initial implementation of the weak hook requirement) indicated that catch rates of white marlin and roundscale spearfish were nearly 46 percent higher with weak hooks compared to the stronger circle hooks that had been allowed in the fishery, and the increased catch rates were statistically significant. The NMFS weak hook study did not find any statistically significant impacts to dusky or shortfin mako sharks.

Regarding protected resources, this alternative would maintain existing possession and use requirements for bycatch mitigation gear, as well as protected species safe handling and release training and guidelines as currently specified by NMFS. The bycatch mitigation gear requirements and protected species safe handling and release training and guidelines were implemented to reduce bycatch and bycatch mortality of incidentally captured sea turtles, marine mammals, and other incidentally captured species and were thoroughly analyzed in the FEIS for the 2006 Consolidated HMS FMP. Pelagic longline fishermen would still be required to abide by the circle hook requirements established under the 2004 BiOp for the purpose of mitigating sea turtle bycatch and bycatch mortality (possession and use of corrodible, i.e., non-stainless steel, 18/0 or larger circle hooks with an offset not to exceed 10 degrees, or 16/0 or larger non-offset circle hooks). Anecdotal reports from scientists that conducted the weak hook study indicated that the weak hook was easier to dislodge from incidentally captured/foul hooked leatherback sea turtles

than the current, required standard circle hook. However, the weak hook research conducted in the Gulf of Mexico did not produce a large enough sample size to assess the impacts of weak hooks on sea turtles or other protected species.

Changing the type of hook is not anticipated to change rates of fishing or the distribution of fishing effort. Therefore, the rate of incidental interactions is not anticipated to change. NMFS therefore anticipates neutral indirect impacts to most restricted and protected species, and short- and long-term minor, beneficial, indirect ecological impacts for white marlin and roundscale spearfish as a result of removing the weak hook requirement under Alternative D3.

Socioeconomic Impacts

Under Alternative D3, pelagic longline fishermen would no longer be required to deploy weak hooks with pelagic longline gear, and NMFS would encourage the voluntary use of weak hooks as a conservation strategy. This alternative would likely result in short- and long-term minor beneficial socioeconomic impacts since it would give fishermen more flexibility in choosing how to fish. In the absence of a weak hook requirement, fishermen could choose whether to use the gear based on their knowledge of bluefin tuna presence and distribution. Weak hooks may have, in some cases, assisted fishermen in reducing use of IBQ allocation because large bluefin tuna were able to free themselves from gear before coming to the boat, and therefore never needed to be counted against a vessel's IBQ allocation. Some fishermen may still find their use beneficial in conserving their permit's IBQ allocation, and would still have the option to deploy weak hooks under this alternative. For example, pelagic longline fishermen that plan to fish in areas with high rates of bluefin tuna interactions may wish to deploy weak hooks to reduce interactions and conserve their IBQ allocation. Under Alternative D3, NMFS would encourage the voluntary use of weak hooks and leave the decision up to individual fishermen based on their experience and on-the-water knowledge. Any potentially risky fishing practices leading to elevated interactions with Gulf of Mexico bluefin tuna would still be dis-incentivized under the IBQ Program but could lead to minor adverse impacts to fishermen if more IBQ allocation must be leased to continue fishing.

Short- and long-term indirect socioeconomic impacts to businesses that support fishing would likely be neutral. Changing pelagic longline weak hook requirements in the Gulf of Mexico is unlikely to change fishing effort, but could increase circle hook sales if fishermen buy more non-weak hooks.

Conclusion

This alternative strongly aligns with the objectives of simplifying and streamlining HMS management by removing a fishing regulation that may be redundant with the IBQ Program (since both are intended to control bluefin interactions and the IBQ Program provides for full accounting of bluefin catch and sufficiently incentivizes fishermen to avoid bluefin) and optimizing the ability of pelagic longline fishermen to harvest target quotas. However, removing the weak hook requirement entirely does not align as closely as other alternatives with the objective to continue to minimize bluefin tuna mortality, especially if fishermen do not elect to use weak hooks during spawning season when the risk of encountering spawning bluefin tuna is higher. Although the current IBQ Program likely provides adequate protection for the bluefin tuna stock in the Gulf of Mexico by limiting fishing mortality in the absence of weak hooks, the required use of weak hooks may help fishermen manage their IBQ allocation usage by reducing each fisherman's catch of bluefin tuna. Since weak hooks straighten when enough force is exerted on the hook, they reduce the number of large, spawning bluefin that are brought to the vessel. The use of weak hooks may

provide socioeconomic benefits for fishermen by extending their IBQ allocation, allowing them to fish for a longer period each year. Additionally, during scoping NMFS received more support for retaining a seasonal weak hook requirement (Alternative D2) than removing weak hooks (this alternative) from multiple constituent groups including recreational fishermen, environmental non-government organizations, and commercial (pelagic longline and directed categories) fishermen (for a summary of comments received during the public comment period for the proposed rule, see Appendix F). Overall, Alternative D2 is considered as the alternative that would achieve a better balance between ecological needs of the resource and socioeconomic needs of the fishery over Alternative D3. Therefore, Alternative D3 is not preferred at this time.

4.5 Essential Fish Habitat

Pursuant to 16 U.S.C. 1855(b)(1), and as implemented by 50 C.F.R. §800.815, the Magnuson-Stevens Act requires NMFS to identify and describe EFH for each life stage of managed species and to evaluate the potential adverse effects of fishing activities on EFH including the cumulative effects of multiple fisheries activities. If NMFS determines that fishing gears are having an adverse effect on HMS EFH, or other species' EFH, then NMFS must include management measures that minimize adverse effects to the extent practicable. NMFS completed reviews of fishing gear impacts in the 1999 FMP, Amendment 1 to the 1988 Billfish FMP, the 2006 Consolidated HMS FMP, Amendment 1 to the 2006 Consolidated HMS FMP, and the 2015 Final 5-Year Review of Atlantic HMS EFH. These analyses determined that the majority of HMS gears are fished within the water column and do not make contact with the sea floor.

This section focuses on the potential impacts on EFH of relieving pelagic longline restrictions (including Habitat Areas of Particular Concern, HAPCs) of Atlantic HMS and council-managed species. NMFS discusses the ecological impacts to EFH (including HAPCs) due to each preferred action in this proposed rule. It also provides a review of Atlantic HMS EFH for the focal species of this rulemaking, bluefin tuna. A detailed description of western Atlantic bluefin tuna EFH is available in Chapter 3.

4.5.1 Impacts of Preferred Alternatives on Essential Fish Habitat

Water column habitats can be characterized by physical, chemical, or biological features. Offshore water quality in the Atlantic is controlled by oceanic circulation, which, in the Mid-Atlantic is dominated by the Gulf Stream and by oceanic gyres. A shoreward, tidal and wind-driven circulation dominates as the primary means of pollutant transport between estuaries and nearshore or coastal waters. Water quality in nearshore water masses adjacent to estuarine plumes and in water masses within estuaries is also influenced by density-driven circulation. Suspended sediment concentration can also be used as an indication of water quality. For the Atlantic coastal areas, suspended sediment concentration varies with respect to depth and distance from shore, the variability being greatest in the Mid-Atlantic and South Atlantic. Re-suspended bottom sediment is the principal source of suspended sediments in offshore waters. Activities that may affect circulation patterns, oceanographic temperature and salinity gradients, water quality (i.e., oxygen content, sediment suspension, or nutrient loading) may affect the quality of the habitat and reflect an adverse impact on EFH.

Fishing activity may theoretically have a minor localized effect on water quality. The gear is typically deployed over short (24 hours or less) timeframes. A potential biochemical effect of pelagic longline fishing could include localized increases in biological oxygen demand (BOD) as a result of high concentrations of dead discards. BOD is the amount of dissolved oxygen used by

organisms (i.e., bacteria) while metabolizing organic matter. Bacteria decomposition of dead organisms can reduce dissolved oxygen in the water column below thresholds necessary for fish survival (e.g., Boyd 1973). Widespread fish kills associated with "dead zones" of hypoxia are more closely linked to agricultural runoff and pollution, freshwater discharge, and circulation/stratification patterns (e.g., Rabalais et al. 2002).

Two of the preferred alternatives would provide access opportunities for pelagic longline fishermen. Preferred Alternative A4 would establish the Northeastern United States Pelagic Longline Monitoring Area, and create a corresponding three-year evaluation period during which pelagic longline fishing would be allowed according to specified operational rules between June 1 and June 30. Preferred Alternative C3 would establish the Spring Gulf of Mexico Monitoring Area, and create a corresponding three-year evaluation period during which pelagic longline fishing would be allowed according to specified operational rules between April 1 and May 30 of a given year. Following the evaluation period, the areas would remain either open or closed depending on whether certain interaction thresholds were met and NMFS would analyze fishery data to support future regulatory actions.

Deployment of pelagic longline gear in areas that were previously closed for short periods of time would likely not have a widespread, detrimental effect on pelagic habitat that constitutes EFH for many Atlantic HMS. Although the areas in question have been closed to pelagic longline fishing for 20 years and 3 years, respectively, they are short in duration within a year. Fishing does occur in the same areas during the weeks before and after they are effective. Due to prevailing oceanographic and climatological patterns, it is unlikely that gear set in the first week of July within the Northeastern United States Closed Area would occur over remarkably different oceanographic conditions. Fishing activity would likely not have an acutely different type of impact on EFH if it was deployed in the same area one week earlier (when the area has historically been closed).

In addition, granting access to these areas is not anticipated to increase dead discards of target species or bycatch. These alternatives are not expected to change the amount of effort exerted by pelagic longline fisheries due to the restricted nature of the fishery (i.e., permits are limited access, IBQ operational rules may constrain effort). It is likely that effort by some participants will be redistributed to areas that are open to fishing. Dead discards associated with this action are not likely to be of high enough concentration to induce enough of an increase in BOD to affect Atlantic HMS EFH (or other council-managed species) at a degree that would compromise stock health.

Preferred Alternative B2 would eliminate the Cape Hatteras Gear Restricted Area. This alternative is not anticipated to change fishing techniques or distribution of effort in a way that would increase gear contact with bottom habitats that may be considered EFH. Furthermore, most of the pelagic longline fleet has already had access to this area. Deployment of pelagic longline gear by vessels that were previously, and temporarily, restricted from accessing the gear restricted area would likely not have a widespread, detrimental effect on pelagic habitat that constitutes EFH for many Atlantic HMS. Therefore, impacts to EFH under this alternative are considered neutral.

Alternatives D1, D2, and D3 consider changes to weak hook requirements in the Gulf of Mexico HMS pelagic longline fishery. While each of these alternatives have different effects on fishermen, none are anticipated to change fishing techniques in a way that would change the spatial distribution of effort, increase gear contact with bottom habitats that may be considered EFH, or to impact EFH designated in the pelagic environment. These alternatives are not expected to increase effort in the fishery. Preferred Alternative D2 would establish a seasonal (January-June) requirement for weak hooks in the Gulf of Mexico. Changing the hook type requirement is not anticipated to change the

spatial distribution of effort, increase the amount of fishing effort, increase gear contact with bottom habitats that may be considered EFH, or impact EFH designated in the pelagic environment. Thus, impacts to EFH from Alternatives D1, D2, and D3 are expected to be neutral.

5 Cumulative Impacts

5.1 Past, Present, and Reasonably Foreseeable Actions

The geographic and temporal scope of the area and gear-based alternatives is widely varied. Geographically the alternatives range from the weak hook requirement across the entire Gulf of Mexico to a spatially discrete area off the coast of Cape Hatteras, NC, and temporally they range from weak hooks required year-round to only one month applicability for the Northeastern United States Closed Area.

Cumulatively, the area and gear measures encompass a large amount of open ocean that coincides with a wide variety of activities during the applicable time periods, including fisheries for Atlantic HMS and for Council-managed species. Some examples of these fisheries include: the Northeast scallop fishery; Northeast groundfish fishery; tilefish fishery; Gulf of Mexico reef fish fishery; *Loligo* and *Illex* squid trawl fisheries; shark bottom longline fishery; Atlantic dolphin/wahoo fishery; and various recreational fisheries. Many of these fisheries occur in the benthic or mid-water areas of the water column. The alternatives address operations of the pelagic longline fishery. Although these other fisheries operate in some of the same areas open for pelagic longline fishing, minimal interactions occur between these fisheries and the pelagic longline fisheries. Pelagic longline gear is fished high in the water column and is rarely used in the benthic to mid-water columns of the ocean, where the majority of the other fisheries' activities occur. Therefore, NMFS has determined that the appropriate scope of the cumulative effects analysis is limited to fisheries and activities or actions that also affect the pelagic environment and habitats within the action area, primarily the directed tuna and swordfish fisheries and fisheries that bycatch tunas or swordfish.

As discussed in Chapter 3, NMFS has taken a number of actions in the past to, among other things, rebuild overfished fisheries and achieve maximize sustainable yield. These actions have included FMPs, FMP amendments, and framework actions. The goals and objectives of these past rules are summarized in Chapter 3. NMFS is required to take similar actions in this document and can reasonably expect to implement regulations in the future to address the management and conservation of Atlantic tunas and swordfish in directed tuna or swordfish fisheries and in fisheries that catch tunas or swordfish. The need and objectives of this document are described in earlier sections, particularly Chapter 1, and are not repeated here.

Recent major actions and proposed actions within HMS fisheries that may affect commercial and recreational HMS fishermen both directly and indirectly are listed below (Table 5.1). NMFS has updated the list of 2019 actions from the DEIS to the FEIS. A comprehensive list of all actions annually can be found in Chapter 1 of the HMS SAFE Report.

Table 5.1 Recent Actions within HMS Fisheries that May Affect HMS Fishermen Using Pelagic Longline Gear or Fishing For Bluefin Tuna

Federal Register Citation	Date	Rule or Notice
2019		
84 FR 3742	2/13/2019	Inseason quota transfer from Reserve Category to General Category
84 FR 5358	2/21/2019	Final Rule for Amendment 11 to Address Overfishing of Shortfin Mako Sharks
84 FR 6701	2/28/2019	Annual Adjustment of the Atlantic Bluefin Tuna Purse Seine and Reserve Category Quotas; Inseason Quota Transfer from the Reserve Category to General Category
84 FR 7302	3/4/2019	Closure of the General category January fishery for 2019
84 FR 9719	3/18/2019	Closure of Angling Category Trophy South
84 FR 15189	4/15/2019	Notice Related to the Proposed Collection of Information on Recreational Catch and Bluefin Tuna Landings
84 FR 20296	5/09/2019	Adjustment to Atlantic Bluefin Tuna Angling Category Recreational Daily Retention Limit
84 FR 22112	5/16/2019	Notice of Intent to Prepare a Draft Environmental Impact Analysis Related to Research and Data Collection in Support of Spatial Fisheries Management
84 FR 22731	5/20/2019	Adjustment to Bluefin Tuna General Category Daily Retention Limit for June–August Subquota Time Period
84 FR 23020	5/21/2019	Notice of Intent to Prepare an Environmental Impact Analysis for Bluefin Tuna Management Measures
84 FR 25707	6/04/2019	Closure of Bluefin Tuna Angling Category Gulf of Mexico Trophy Fishery
84 FR 29088	6/21/2019	Adjustment of Swordfish General Commercial Permit Retention Limit
84 FR 30954	6/28/2019	Closure of Bluefin Tuna Angling Category Northern Area Trophy Fishery
84 FR 33008	7/11/2019	Adjustment to Bluefin Tuna General Category Daily Retention Limit for June–August Subquota Period
84 FR 33205	7/12/2019	Proposed Rule to Adjust Atlantic Bluefin Tuna Pelagic Longline Area-Based and Weak Hook Measures
84 FR 35340	7/23/2019	Transfer of 30 mt to Bluefin Tuna Harpoon Category
84 FR 38143	8/06/2019	Transfer of 15 mt to Bluefin Tuna Harpoon Category
84 FR 39208	8/09/2019	Closure of Bluefin Tuna Harpoon Category Fishery
84 FR 39978	8/09/2019	Closure of Bluefin Tuna General Category Fishery for June–August Subquota Period
84 FR 45941	9/03/2019	Notice of Intent to Initiate Amendment Related to 2016 Revised National Standards 1, 3, and 7 Guidelines and Other National Policy Directives
84 FR 47440	9/10/2019	Adjustment of 2019 Norther Albacore, Nor and South Atlantic Swordfish, and Atlantic Bluefin Tuna Reserve Category Quotas
84 FR 48566	9/16/2019	Closure of Bluefin Tuna General Category Fishery for September Subquota Period
84 FR 52806	10/03/2019	Transfer of 100 mt to the General Category Atlantic Bluefin Tuna October–November 2019 Subquota Period
84 FR 63812	11/18/2019	Adjustment of Bluefin Tuna General Category December Subquota to 28.9 mt
2018		
83 FR 8037	2/23/2018	Proposed Rule to Revise Atlantic Shark Fishery Closure Regulations
83 FR 8946	3/02/2018	Emergency Interim Final Rule to Address Overfishing of Atlantic Shortfin Mako Sharks
83 FR 8969	3/02/2018	Notice of Intent for Scoping of Atlantic Bluefin Tuna Pelagic Longline Area-Based and Weak Hook Measures

83 FR 9232	3/05/2018	Transfer of 10 Metric Tons of Atlantic Bluefin Tuna Quota from the Reserve category to the January 2018 subquota Period and Closes the General Category Fishery for Large Medium and Giant Bluefin Tuna Until the General Category Reopens on June 1, 2018
83 FR 9255	3/05/02018	Notice of Intent to Prepare an Environmental Impact Statement for Shortfin Mako Shark Management Measures
83 FR 10802	3/13/2018	Blacktip shark, aggregated LCS, and hammerhead sharks western Gulf of Mexico sub-region closure
83 FR 17110	4/18/2018	Annual Adjustment of Bluefin Tuna Purse Seine and Reserve Category Quotas; Inseason Quota Transfer from the Reserve Category to the Longline category for April 13–December 31
83 FR 18230	4/26/2018	Atlantic Bluefin Tuna Angling Category Fishery Daily Retention Limit Adjustment April 26–December 31
83 FR 21936	5/11/2018	Atlantic Bluefin Tuna General Category Fishery Daily Retention Limit Adjustment for June 1–August 31
83 FR 22602	5/16/2018	Atlantic Bluefin Tuna Angling Category Gulf of Mexico Trophy Fishery Closure March 13–December 31
83 FR 30884	7/2/2018	Swordfish General Commercial Permit Retention Limit Adjustment July 1 – December 31, 2018
83 FR 31517	7/6/2018	Proposed Rule for Atlantic Bluefin Tuna and Northern Albacore Quotas; Minor Regulatory Change to Address Shark-damaged Tunas
83 FR 33870	7/18/2018	Atlantic Region Commercial Aggregated Large Coastal Shark and Hammerhead Shark Management Groups Retention Limit Adjustment July 18–December 31
83 FR 35566	7/27/2018	Atlantic Bluefin Tuna Angling Category Northern Area Trophy Fishery Closure July 26
83 FR 35590	7/27/2018	Proposed Rule for Amendment 11 to the 2006 Consolidated HMS FMP on Shortfin Mako Shark Management
83 FR 37446	8/1/2018	Adjustments to 2018 North and South Atlantic Swordfish Quotas
83 FR 38664	8/7/2018	Inseason Transfer of 30 t Atlantic Bluefin Tuna Quota from the Reserve Category to the Harpoon Category
83 FR 42452	8/22/2018	Extension of Emergency Measures to Address Overfishing of Atlantic Shortfin Mako Shark
83 FR 42607	8/23/2018	Atlantic Bluefin Tuna General Category Fishery Daily Retention Limit Adjustment August 23–31
83 FR 45866	9/11/2018	Proposed Rule to Establish Quotas, Opening Dates, and Retention Limits for the 2019 Atlantic Shark Commercial Fishing Season
83 FR 47598	9/20/2018	Comment Period Extension for the Proposed Rule for Amendment 11 to the 2006 Consolidated HMS FMP on Shortfin Mako Shark Management
83 FR 47843	9/21/2018	Inseason Transfer of 30 t Atlantic Bluefin Tuna Quota from the Reserve Category to the General Category and Closure of the General Category Fishery September 23– 30
83 FR 50857	10/10/2018	Inseason Transfer of 55 t Atlantic Bluefin Tuna Quota from the Reserve Category and Harpoon Category to the General Category and Closure of the General Category Fishery October 5–December 1
83 FR 51391	10/11/2018	Final Rule for Atlantic Bluefin Tuna and Northern Albacore Quotas; Minor Regulatory Change to Address Predator-damaged Tunas
83 FR 52169	10/16/2018	Atlantic Bluefin Tuna General Category Fishery Reopen October 15–16
83 FR 55108	11/2/2018	Atlantic Bluefin Tuna General Category Fishery Reopen October 31–November 2
83 FR 57340	11/15/2018	Atlantic Bluefin Tuna General Category Fishery Reopen November 12–16

83 FR 60777	11/27/2018	Final Rule to Establish Quotas, Opening Dates, and Retention Limits for the 2019 Atlantic Shark Commercial Fishing Season
83 FR 63831	12/12/2018	Selection of All Registered HMS Tournaments for Reporting
83 FR 65571	12/21/2018	Adjustment of Swordfish General Commercial Permit Retention Limit
83 FR 67140	12/28/2018	General Category Quota Transfer from Dec 19 subquota to Jan 19 subquota
2017		
82 FR 3209	1/11/2017	Final rule; Atlantic Highly Migratory Species; Technical Amendment to Regulations
82 FR 4856	1/17/2017	Notice of Receipt of an Application for Exempted Fishing Permit and Availability of Draft Environmental Assessment for Pelagic Longline Research in East Florida Coast Closed Area
82 FR 10746	2/15/2017	Extension of Comment Period and Announcement of Public Webinar for Exempted Fishing Permit Application for Pelagic Longline Research in East Florida Coast Closed Area
82 FR 12296	3/2/2017	Annual Adjustment of Atlantic Bluefin Tuna Purse Seine and Reserve Category Quotas; Inseason Quota Transfer of 45 t from the Reserve Category to the Longline Category
82 FR 12747	3/7/2017	Inseason Transfer of 40 t Atlantic Bluefin Tuna Quota from the Reserve Category to the General Category and Adjusted Daily Retention Limit for March 5–March 31
82 FR 14162	3/17/2017	Atlantic Bluefin Tuna Angling Category Southern Area Trophy Fishery Closure March 20
82 FR 16136	4/3/2017	Atlantic Bluefin Tuna General Category Fishery Closure March 29–May 31
82 FR 16478	4/4/2017	Final Rule to Implement Amendment 5b to the 2006 Consolidated HMS FMP
82 FR 19615	4/28/2017	Atlantic Bluefin Tuna Angling Category Recreational Daily Retention Limit Adjustment April 30–December 31
82 FR 22616	5/17/2017	Atlantic Bluefin Tuna General Category Fishery Daily Retention Limit Adjustment for June 1–August 31
82 FR 26603	6/8/2017	Atlantic Bluefin Tuna Angling Category Gulf of Mexico Trophy Fishery Closure June 7
82 FR 36689	8/7/2017	Atlantic Bluefin Tuna General Category Fishery Daily Retention Limit Adjustment August 5–December 31
82 FR 37566	8/11/2017	Issuance of Exempted Fishing Permit and Availability of Final Environmental Assessment for Pelagic Longline Research in East Florida Coast Closed Area
82 FR 37825	8/14/2017	Atlantic Bluefin Tuna Angling Category Northern Area Trophy Fishery Closure August 11
82 FR 39047	8/17/2017	Atlantic Bluefin Tuna General Category Fishery Closure August 16–31
82 FR 39735	8/22/2017	Proposed Rule to Establish Quotas, Opening Dates, and Retention Limits for the 2018 Atlantic Shark Commercial Fishing Season
82 FR 41356	8/31/2017	Atlantic Bluefin Tuna General Category Fishery Daily Retention Limit Adjustment September 1–December 31
82 FR 43500	9/18/2017	Adjustments to 2017 Northern Albacore Quota, North and South Atlantic Swordfish Quotas, and Atlantic Bluefin Tuna Reserve Category Quota
82 FR 43711	9/19/2017	Atlantic Bluefin Tuna General Category Fishery Closure September 17–30
82 FR 43710	9/19/2017	Notification that the Northeast Distant Area (NED) quota is filled and Atlantic Tunas Longline Category Individual Bluefin Quota Accounting Rules Now Apply in the NED
82 FR 46000	10/3/2017	Inseason Transfer of 156.4 t Atlantic Bluefin Tuna Quota from the Reserve Category to the General Category
82 FR 46934	10/10/2017	Atlantic Bluefin Tuna General Category Fishery Closure October 5–November 30

82 FR 49303	10/25/2017	Proposed Rule to Modify Individual Bluefin Tuna Quota Program Regulations for Accounting for Bluefin Tuna
82 FR 49773	10/27/2017	Proposed Rule for an Atlantic Highly Migratory Species Charter/Headboat Permit Commercial Sales Provision
82 FR 55520	11/22/2017	Transfer of Unused Atlantic Bluefin Tuna Harpoon Category Quota to the General Category; General Category Fishery Opens December 1 with 12.7 t Quota
82 FR 55512	11/22/2017	Final Rule to Establish Quotas, Opening Dates, and Retention Limits for the 2018 Atlantic Shark Commercial Fishing Season
82 FR 57543	12/6/2017	Final Rule for an Atlantic Highly Migratory Species Charter/Headboat Permit Commercial Sales Provision
82 FR 57885	12/8/2017	Atlantic Bluefin Tuna General Category Fishery Closure December 6–31, 2017
82 FR 61489	12/28/2017	Final Rule to Modify Individual Bluefin Tuna Quota Program Regulations for Accounting for Bluefin Tuna

The preferred alternatives in this document would implement measures to address commercial fisheries regulations related to the use of weak hooks and the management of areas previously closed/restricted for bluefin tuna. Commercial fishermen with pelagic longline gear would be subjected to modified requirements for access to pelagic longline Closed Areas and gear restricted areas, and modifications to the requirements for the use of weak hooks. NMFS would continue collecting and monitoring commercial landings of target species through existing reporting mechanisms. The preferred alternatives are considered to be the best balance of rulemaking objectives, which are:

- Continue to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear consistent with the conservation and management objectives (e.g., prevent or end overfishing, rebuild overfished stocks, manage Atlantic HMS fisheries for continuing optimum yield) of the 2006 Consolidated Atlantic HMS FMP, its amendments, and all applicable laws.
- Simplify and streamline Atlantic HMS management, to the extent practicable, by reducing any redundancies in regulations established to reduce bluefin tuna interactions that apply to the pelagic longline fishery.
- Optimize the ability for the pelagic longline fishery to harvest target species quotas (e.g., swordfish), to the extent practicable, while also considering fairness among permit/quota categories.

Although impacts vary by across species within broad groupings, in general the preferred alternatives have mostly neutral or minor and positive ecological and economic impacts. Thus, the overall cumulative impacts of the preferred alternatives could have minor beneficial cumulative ecological impacts and neutral to minor beneficial cumulative socioeconomic impacts.

The following past and ongoing actions had or would have varying degrees of synergistic impacts on the human environment when considered in conjunction with the action in the alternatives:

- In 2011, NMFS published a rule that requires pelagic longline vessels fishing in the Gulf of Mexico to use weak hooks (76 FR 18653; April 5, 2011) to reduce bluefin tuna mortality in their spawning grounds. White marlin and roundscale spearfish were shown to have statistically significant increases in catch rates with this hook type. Although there was a projected increase in white marlin catches this regulation was expected to have moderate ecological benefits for spawning bluefin tuna. The 2011 weak hook requirement likely resulted in neutral cumulative adverse socioeconomic impacts on fishermen in the Gulf of Mexico region because catch composition was not predicted to significantly change for target species, such as yellowfin tuna or swordfish. When this action is considered in conjunction with the 2011 weak hook

requirement, it is anticipated this action may have neutral cumulative socioeconomic impacts on the pelagic longline fishery because this rule would change the requirement for weak hook use to a seasonal requirement, which would not increase any burden on pelagic longline fishery participants.

- On January 1, 2015, NMFS implemented Amendment 7 (79 FR 71510; December 2, 2014). The rule dramatically changed bluefin tuna management, particularly within the pelagic longline fishery. Amendment 7 allocated U.S. bluefin tuna quota among domestic fishing categories. It also implemented measures applicable to the pelagic longline fishery, including: the IBQ Program; the Spring Gulf of Mexico Gear Restricted Area; the Cape Hatteras Gear Restricted Area; closure of the pelagic longline fishery when annual bluefin tuna quota is reached; elimination of target catch requirements associated with retention of incidental bluefin tuna in the pelagic longline fishery; mandatory retention of legal-sized bluefin tuna caught as bycatch; expanded monitoring requirements, including EM via cameras and bluefin tuna catch reporting via VMS; and transiting provisions for pelagic longline and bottom longline vessels. The rule also had impacts on the recreational fishery by changing the allocation of the Angling category Trophy South subquota for bluefin tuna for the Gulf of Mexico. This rule proposes to modify or remove the Spring Gulf of Mexico Gear Restricted Area and Cape Hatteras Gear Restricted Area management measures implemented under Amendment 7. The remaining Amendment 7 measures for the pelagic longline fishery could have moderate beneficial ecological cumulative impacts on bluefin tuna in conjunction with this action since the implementation of the IBQ Program has reduced the amount of landings and dead discards of bluefin tuna and is considered to be a mitigative factor in deregulation. When this action is considered in conjunction with the Amendment 7, it is anticipated this action may have minor beneficial to neutral cumulative socioeconomic impacts. Retaining the Cape Hatteras Gear Restricted Area with performance based access to limit bluefin tuna interactions (which no longer restricts many active fleet participants) while at the same time requiring fishery participants to individually account for their bluefin tuna catch through the IBQ Program and requiring electronic monitoring and weak hook requirements, is unnecessarily restrictive of pelagic longline fishery effort, particularly where overall limits on quota are established through science-based quotas and subsequently enforced and monitored through a careful management regime that further divides and manages that quota at several levels. Similarly, this action provides an opportunity to collect more information about fishery interactions within the boundaries of the Spring Gulf of Mexico Gear Restricted Area at a time when it was previously closed. The evaluation process that would be undertaken as part of the preferred alternative would enable future data collection to determine whether retaining a spatially managed area is warranted, or if it is unnecessarily restrictive of pelagic longline fishery effort.

- On October 11, 2018, NMFS published a final rule (83 FR 51391) to adjust and recalculate the baseline annual U.S. quota and subquotas for Atlantic bluefin tuna and the baseline annual U.S. Northern Atlantic albacore tuna quota to reflect quotas adopted by ICCAT. Additionally, this final rule updated regulatory language on school bluefin tuna, made a minor change to the Atlantic tuna's size limit regulations to address retention, possession, and landing of bigeye and yellowfin tuna damaged through predation by sharks and other marine species. Cumulative ecological impacts of the preferred alternatives in the final rule were expected to be neutral to minor beneficial, while the socioeconomic impacts were expected to be minor and beneficial. The modification of language to address damaged tunas through predation by sharks and other marine species, was primarily economic and administrative, and no environmental effects were anticipated because the change only allows for retention of a very limited number of fish that would otherwise be caught but need to be discarded.

- On March 3, 2019, NMFS implemented Amendment 11 to the 2006 Consolidated HMS FMP (84 FR 5358; February 21, 2019)(Amendment 11). This rule implemented management measures to address overfishing and rebuild the overfished North Atlantic shortfin mako shark stock. These measures are based on the ICCAT stock assessment that determined that shortfin mako sharks are overfished and experiencing overfishing. Management measures also reflect ICCAT Recommendation 17-08 (updated by Recommendation 19-06). Commercial measures would allow retention of shortfin mako sharks by HMS permit holders when caught with longline or gillnet gear and only if the shark is dead at haulback. Retention of dead shortfin mako sharks with pelagic longline gear is allowed only if there is a functional EM system on board the vessel. Recreational measures would increase the minimum size limit for retention of shortfin mako sharks from 54 inches fork length (straight line) to 71 inches fork length for males and 83 inches fork length for females and require the use of circle hooks for recreational shark fishing in all areas. Overall, Amendment 11 was expected to have beneficial ecological impacts in the short- and long-term and minor adverse or neutral cumulative socioeconomic impacts on participants in the recreational and commercial fisheries. When considered in combination of this action it is not anticipated to create any additional adverse impacts to pelagic longline fishermen or to the stocks in question.

- In May 2019, NMFS published a Notice of Intent and announced the availability of a scoping document for Amendment 13 to the 2006 Consolidated HMS FMP (Amendment 13) (84 FR 23020; May 21, 2019). The scoping document explores management options that would modify bluefin tuna management, particularly within the pelagic longline fishery. The Amendment 13 scoping document includes options that would modify allocated U.S. bluefin tuna quota among domestic fishing categories; implement measures applicable to the pelagic longline fishery, including the IBQ Program, closure of the pelagic longline fishery when annual bluefin tuna quota is reached, elimination of target catch requirements associated with retention of incidental bluefin tuna in the pelagic longline fishery, sunset the purse seine fishery, and modify the directed fishery category regulations as appropriate. The cumulative ecological impacts between the alternatives presented in this FEIS and Amendment 13 depend on the scope and nature of alternatives developed for Amendment 13.

- In May 2019, NOAA Fisheries published a Notice of Intent scoping document that considers options to perform research and collect data in support of spatial Atlantic HMS fisheries management (84 FR 22112; May 16, 2019). Fishery-dependent data is vital in informing and supporting effective fisheries management and areas that restrict fishing effort often have a commensurate decrease in fishery-dependent data collection. Strategies to facilitate research and data collection in these areas could improve sustainable management of Atlantic HMS. The Issues and Options document considers ways to perform research and collect data in all Atlantic HMS Closed Areas to assess the effectiveness of spatial Atlantic HMS fisheries management. The cumulative ecological impacts between alternatives considered in this FEIS and the issues considered under the initiative to perform research and collect data in support of spatial management depend on the scope and nature of alternatives developed in the future for that draft rule.

- The Deepwater Horizon Oceanic Fish Restoration program is currently active in the Gulf of Mexico region and selects pelagic longline vessels on an annual basis to participate in the program. These vessels are compensated to refrain from fishing pelagic longline gear when bluefin tuna are present and spawning in the Gulf of Mexico, and are encouraged to fish with alternative gears (e.g. green-stick and buoy gear) for swordfish and yellowfin tuna. While the

pelagic longline vessels are not actively fishing longline gear the IBQ allocations to those vessels are locked and cannot be used. This program will be active for another 3 to 6 years (depending on the number of applicants; the program is funded to cover 60 "vessel years"). As a result of vessels participating in this project, the number of vessels actively fishing pelagic longline in the winter and spring in the Gulf of Mexico may decrease; therefore, there could be minor beneficial cumulative ecological impacts.

- On September 15, 2017, the first marine national monument in the Atlantic Ocean, the Northeast Canyons and Seamounts Marine National Monument was created. The total area of the monument is 4,913 square miles of ocean. Commercial fishing and other resource extraction activities have been prohibited within the monument boundaries on a year-round basis. Recreational fishing is allowed to occur in the monument boundaries. The National Monument does not intersect with any areas considered in this rule. However, it is located in close proximity to the current boundaries of the Northeastern United States Closed Area. Since prevailing currents might cause gear set between the National Monument and the Northeastern United States Closed Area to drift into a prohibited area, these closures may indirectly create a buffer zone with little fishing (since fishermen should be minimizing risk associated with gear drift). Alternatives that maintain the eastern end of the Northeastern United States Closed Area would likely also maintain this buffer zone as a refuge for the species that live in or migrate through this area. However, since the National Monument has been in existence since 2016, the data analyzed in this FEIS encompass the recent redistribution of effort around the National Monument and corresponding ecological and socioeconomic impacts. No additional cumulative impacts are anticipated as a result of the National Monument, because the National Monument is already part of the management and regulatory environment.

5.2 Cumulative Ecological Impacts

Each alternative is described in Chapter 2 and a detailed discussion of ecological impacts for each alternative can be found in Chapter 4. Under Preferred Alternative A4, for a three-year evaluation period vessels using longline would be authorized to access the Northeastern United States Monitoring area during the month of June. NMFS will closely monitor the area, and after three years, determine if a change in management is needed. During the evaluation period an annual bluefin tuna landing and dead discard threshold based on IBQ allocation usage would apply to limit bluefin landings and dead discards within the Monitoring Area. The threshold is based on the average annual amount of available IBQ allocation in the Atlantic region from June 1 through December 31. When/if the IBQ allocation threshold is reached, or is projected to be reached, NMFS would file a closure notice with the Office of the Federal Register. On and after the effective date of the notice, for the remainder of the evaluation period and subsequent years after, unless NMFS determines otherwise, the Northeastern United States Monitoring Area would be closed to pelagic longline fishing. If the threshold is not met while the Monitoring Area is effective, then pelagic longline fishing could continue in the Monitoring Area in subsequent effective months in the following year(s) for the duration of the evaluation period.

NMFS has added two clarifying modifications from the DEIS to the FEIS to Preferred Alternative A4. The first addresses what would happen if the U.S. allocation of bluefin is changed at a future ICCAT meeting. The 150,519 lb threshold is approximately 72 percent of the adjusted total Atlantic IBQ allocation currently distributed to the fleet. In the event that the western Atlantic bluefin tuna quota later is reduced at ICCAT and the U.S. allocation of bluefin quota is adjusted downward as a result, the threshold would also be adjusted. Such adjustment would make the threshold 72 percent of the total Atlantic IBQ allocation disbursed to the fleet as a result of the lower U.S

allocation. If the ICCAT quota were to increase and the United States' allocation increased as well, adjustments would not be made to increase the threshold for several reasons. The second clarifying modification concerns the timing of inseason notices that could be filed in response to the threshold for this area being met. NMFS originally noted in the DEIS in the description of the preferred alternative that "If no closure notice is filed between January 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action". Since the thresholds are not cumulative in nature with respect to IBQ allocation use by the pelagic longline fishery to account for landings and dead discards, the design of this process would not necessitate inseason closure to be filed until after the respective start dates for monitoring. NMFS is adjusting this statement to read "If no closure notice is filed between April 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action".

This preferred alternative would allow NMFS to continue monitoring commercial landings of bluefin tuna in a timely and efficient manner. The status of the Monitoring Area following the evaluation period (i.e., whether the area remains open during the month of June), when NMFS is developing a report and any necessary follow up actions, depends on whether the threshold has been reached. Ecological impacts of this alternative are likely to result in direct short- and long-term neutral impacts on target catch species and minor beneficial impacts for bluefin tuna. Protected and restricted species indirect ecological impacts are likely to range in the short- and long-term from minor and beneficial to neutral.

Preferred Alternative B2 would remove the current gear restricted area off Cape Hatteras, North Carolina as defined in § 635.2 and all associated regulatory provisions, restrictions, and prohibition. Alternative B2 would likely result in short- and long-term neutral ecological impacts to all species because most fishery participants have met the access criteria for the gear restricted area and this alternative would not greatly increase effort or bluefin interactions in this area.

Preferred Alternative C3 would create the Spring Gulf of Mexico Monitoring Area, which will authorize pelagic longline access to the Spring Gulf of Mexico Monitoring Area for a three year evaluation period. The Agency will closely monitor the areas, and after three years, determine if a change in management is needed. Similarly to Preferred Alternative A4, an annual threshold of bluefin tuna landings and dead discards would be established to allow continued access during the months of April and May. This threshold is based on the amount of IBQ annual allocation distributed to vessels that fished in the region while the closures were effective (i.e., the months of April and May) between 2015 and 2017. When/if the IBQ allocation threshold is reached, or is projected to be reached, NMFS would file a closure notice with the Office of the Federal Register. On and after the effective date of the notice, for the remainder of the evaluation period and subsequent years after, unless NMFS determines otherwise, the Spring Gulf of Mexico Monitoring Area would be closed to pelagic longline fishing. If the threshold is not met while the Monitoring Area is effective, then pelagic longline fishing could continue in the Monitoring Area in subsequent effective months in the following year(s) for the duration of the evaluation period. The status of the Monitoring Area following the evaluation period (i.e., whether the area remains open during the months of April and May), when NMFS is developing a report and any necessary follow up actions, depends on whether the threshold has been reached. This would prevent additional Gulf of Mexico mortality, beyond what is allowed in the IBQ Program, from occurring as a result of allowing access to the Monitoring Areas. The limits on mortality would likely result in direct, short- and long-term, neutral ecological impacts for bluefin tuna and target catch species. Impacts to protected and restricted species would likely result in indirect, short- and long-term, in neutral to minor beneficial ecological impacts.

NMFS has added two clarifying modifications from the DEIS to the FEIS to Preferred Alternative A4. The first addresses what would happen if the U.S. allocation of bluefin is changed at a future ICCAT meeting. The 63,150 lb threshold is approximately 55 percent of the adjusted total Atlantic IBQ allocation currently distributed to the fleet. In the event that the western Atlantic bluefin tuna quota later is reduced at ICCAT and the U.S. allocation of bluefin quota is adjusted downward as a result, the threshold would also be adjusted. Such adjustment would make the threshold 55 percent of the total Gulf of Mexico IBQ allocation disbursed to the fleet as a result of the lower U.S allocation. The second clarifying modification concerns the timing of inseason notices that could be filed in response to the threshold for this area being met. NMFS originally noted in the DEIS in the description of the preferred alternative that "If no closure notice is filed between January 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action". Since the thresholds are not cumulative in nature with respect to IBQ allocation use by the pelagic longline fishery to account for landings and dead discards, the design of this process would not necessitate inseason closure to be filed until after the respective start dates for monitoring. NMFS is adjusting this statement to read "If no closure notice is filed between April 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless, and until, NMFS decides to take additional action".

Preferred Alternative D2 would modify the requirements for weak hooks from a year-round requirement in the Gulf of Mexico to a seasonal requirement. Bluefin tuna catch in the Gulf of Mexico is currently limited by the IBQ Program and bluefin tuna spawn in the Gulf of Mexico in the spring. Preferring a seasonal requirement for weak hook use would maintain the protections to adult bluefin tuna during spawning, when they are most abundant in the Gulf of Mexico. Modification of the weak hook requirement may increase the probability of retention of large target species (e.g., swordfish, yellowfin tuna), while still protecting spawning bluefin tuna in the spring. In the short- and long-term, the preferred alternative could have direct, neutral ecological impacts on target species and bluefin tuna. Short- and long-term, indirect impacts on protected and restricted species, are anticipated to be neutral since large changes in catch of these species are not likely affected by weak hooks. This requirement could be potentially beneficial to white marlin and roundscale spearfish when the weak hook requirement is not in effect due to significantly higher catch rates of these species with weak hooks (See Appendix B).

5.3 Cumulative Social and Economic Impacts

Each alternative is described in Chapter 2 and a detailed discussion of socioeconomic impacts for each alternative can be found in Chapter 4.

Under preferred Alternative A4, for a three-year evaluation period vessels using longline would be authorized to access the Northeastern United States Monitoring Area, which would remain open during the effective period. The Agency will closely monitor the area, and, after three years, determine if a change in management is needed. During the evaluation period a threshold based on IBQ allocation usage would apply to limit bluefin tuna landings and dead discards within the Monitoring Area. As discussed in the description of the Preferred Alternatives in Section 5.2, NMFS has added two clarifying modifications from the DEIS to the FEIS to Preferred Alternative A4. This alternative gives fishermen more flexibility to determine where to fish to optimize target catch in the region encompassing the Northeastern United States Closed Area. This could potentially result in shorter trips and lower fuel costs, and thus potentially increase fishing profits. Shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing, and reduce the social impacts of crew and captains

being separated from their families while at sea. Short- and long-term direct socioeconomic impacts of this alternative range from minor and beneficial to neutral. Indirect impacts to shore-side business may have reduced fuel sales that could result in minor adverse impacts.

Preferred Alternative B2 would remove the current gear restricted area off Cape Hatteras, North Carolina as defined in § 635.2 and all associated regulatory provisions, restrictions, and prohibitions. Alternative B2 would likely result in short- and long-term direct neutral to minor beneficial socioeconomic impacts because this would allow a small number of pelagic longline vessels that previously did not meet access criteria to fish in the area permanent access by removal of the gear restricted area. Indirect short-and long-term socioeconomic impacts to shoreside businesses would likely be neutral.

Preferred Alternative C3 would create the Spring Gulf of Mexico Monitoring Area that would authorize pelagic longline vessels access the Spring Gulf of Mexico Monitoring Area. The Agency will closely monitor the area, and, after three years, determine if a change in management is needed. A threshold for access based on the annual Gulf of Mexico IBQ allocation would prevent additional Gulf of Mexico mortality from occurring as a result of the evaluation period within the Monitoring Area. As discussed in the description of the Preferred Alternatives in Section 5.2, NMFS has added two clarifying modifications from the DEIS to the FEIS to Preferred Alternative C3. This alternative would increase flexibility in area open to fishing and areas with higher target catch catch-per-unit efforts. Thus, direct, short- and long-term, minor beneficial to neutral socioeconomic impacts are likely to occur for pelagic longline vessels. Indirect, short- and long-term, impacts on shoreside businesses are expected to be neutral.

Preferred Alternative D2 would modify the requirements for weak hooks to only a seasonal requirement. Individual vessels must account for bluefin tuna catch in the Gulf of Mexico through the IBQ Program, which incentivizes those participating in the pelagic longline fishery to minimize interactions with bluefin. Preferring a seasonal requirement for weak hook use would maintain the protections to adult bluefin tuna when they are most abundant in the Gulf of Mexico. Modification of the weak hook requirement would allow greater probability of retention of target species, while still protecting spawning bluefin tuna in the spring. In the long-term, any management alterations adopted in this action could have direct, moderate beneficial socioeconomic impacts due to higher retention of large target species while not affecting bluefin tuna landings. Short- and long-term, indirect impacts on shoreside businesses are expected to be minor beneficial due to possible increases in tackle sales and landings of larger target species.

Overall, the preferred alternatives in this action are expected to have minor beneficial or neutral cumulative socioeconomic impacts on participants in the commercial fisheries, based on the detailed discussions of the socioeconomic impacts of each of the preferred actions in Chapter 4.

5.4 Cumulative Impacts

Cumulative impacts are the impacts on the environment, which result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). A cumulative impact includes the total effect on a natural resource, ecosystem, or human community due to past, present, and reasonably foreseeable future activities or actions of federal, non–federal, public, and private entities. Cumulative impacts may also include the effects of natural processes and events, depending on the specific resource in question. Cumulative impacts include the total of all impacts to a particular resource that have

occurred, are occurring, and would likely occur as a result of any action or influence, including the direct and reasonably foreseeable indirect impacts of a federal activity. The goal of this section is to describe the cumulative ecological, economic and social impacts of past, present, and reasonably foreseeable future actions with regard to the management measures presented in this document (Table 5.2). Direct and indirect impacts are combined in one row in the table below. Direct impacts of the alternatives are related bluefin tuna and target species and indirect impacts of the alternatives are related to restricted and protected resources. Both direct and indirect impacts of the alternatives are related to the socioeconomic discussion in Table 5.2 (see full discussion in Chapter 4).

Table 5.2 Comparison of the Impacts of Analyzed Alternatives. Alternatives are Classified as Neutral, Minor and Adverse, and Minor and Beneficial. A Range of Minor Adverse to Minor Beneficial (or Vice Versa) May Include Neutral Impacts under Certain Conditions

Alternative	Quality	Time Frame	Target Species and Bluefin Tuna	Restricted and Protected Species	Socioeconomic
Alternatives for the Northeast United States Closed Area					
A1 No Action	Direct/indirect	Short-term	Neutral	Neutral	Neutral
		Long-term	Neutral	Neutral	Neutral
	Cumulative		Neutral	Neutral	Neutral
A2 Modify the Current Northeastern United States Closed Area to Remove a Western Portion of the Closure	Direct/indirect	Short-term	Neutral	Neutral to minor beneficial	Neutral to minor beneficial
		Long-term	Neutral	Neutral to minor beneficial	Neutral to minor beneficial
	Cumulative		Neutral	Neutral to minor beneficial	Neutral to minor beneficial
A3 Apply Individual Performance Based Access to the Northeastern United States Pelagic Longline Closure.	Direct/indirect	Short-term	Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
		Long-term	Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
	Cumulative		Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
A4 *Evaluate the Northeastern United States Closed Area (Preferred Alternative)*	Direct/indirect	Short-term	Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
		Long-term	Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
	Cumulative		Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
A5 Eliminate the Northeastern United States Closed Area	Direct/indirect	Short-term	Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
		Long-term	Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial
	Cumulative		Neutral to minor beneficial	Minor beneficial to minor adverse	Neutral to minor beneficial

Alternative	Quality	Time Frame	Target Species and Bluefin Tuna	Restricted and Protected Resources	Socioeconomic
Alternatives for Cape Hatteras Gear Restricted Area					
B1 No Action.	Direct/indirect	Short-term	Neutral	Neutral	Neutral
		Long-term	Neutral	Neutral	Neutral
	Cumulative		Neutral	Neutral	Neutral
B2 Remove the Cape Hatteras Gear Restricted Area (Preferred Alternative)	Direct/indirect	Short-term	Neutral	Neutral	Neutral to minor beneficial
		Long-term	Neutral	Neutral	Neutral to minor beneficial
	Cumulative		Neutral	Neutral	Neutral to minor beneficial
Alternative	Quality	Time Frame	Target Species and Bluefin Tuna	Restricted and Protected Resources	Socioeconomic
Alternatives for Spring Gulf of Mexico Gear Restricted Areas					
C1 No action.	Direct/indirect	Short-term	Neutral	Neutral	Neutral
		Long-term	Neutral	Neutral	Neutral
	Cumulative		Neutral	Neutral	Neutral
C2 Apply individual performance based access to the spring Gulf of Mexico Gear Restricted Areas.	Direct/indirect	Short-term	Neutral	Minor beneficial to minor adverse	Neutral
		Long-term	Neutral	Minor beneficial to minor adverse	Neutral
	Cumulative		Neutral	Minor beneficial to minor adverse	Neutral
C3 *Evaluate the Spring Gulf of Mexico Gear Restricted Area (Preferred Alternative)*	Direct/indirect	Short-term	Neutral	Minor beneficial to minor adverse	Neutral to minor beneficial
		Long-term	Neutral	Minor beneficial to minor adverse	Neutral to minor beneficial

	Cumulative		Neutral	Minor beneficial to minor adverse	Neutral to minor beneficial
C4 Eliminate the Spring Gulf of Mexico Gear Restricted Area	Direct/indirect	Short-term	Neutral	Minor beneficial to minor adverse	Neutral to minor beneficial
		Long-term	Neutral	Minor beneficial to minor adverse	Neutral to minor beneficial
	Cumulative		Neutral	Minor beneficial to minor adverse	Neutral to minor beneficial
Alternative	Quality	Time Frame	Target Species and Bluefin Tuna	Restricted and Protected Resources	Socioeconomic
Alternative for Gulf of Mexico Weak Hooks					
D1 No action.	Direct/indirect	Short-term	Neutral	Neutral to minor adverse	Neutral
		Long-term	Neutral	Neutral to minor adverse	Neutral
	Cumulative		Neutral	Neutral to minor adverse	Neutral
D2 *Seasonal requirement for Weak Hooks (Preferred Alternative)*	Direct/indirect	Short-term	Neutral	Neutral	Minor beneficial
		Long-term	Neutral	Neutral	Minor beneficial
	Cumulative		Neutral	Neutral	Minor beneficial
D3 Remove the Weak Hook requirement	Direct/indirect	Short-term	Neutral to minor adverse	Neutral	Neutral
		Long-term	Neutral to minor adverse	Neutral	Neutral
	Cumulative		Neutral to minor adverse	Neutral	Neutral

5.5 Mitigation and Unavoidable Impacts

Mitigation is an important mechanism that Federal agencies can use to minimize, prevent, or eliminate damage to the human and natural environment associated with their actions.

As described in the Center for Environmental Quality regulations, agencies can use mitigation to reduce environmental impact in several ways. Mitigation may include one or more of the following: avoiding the impact by not taking a certain action or parts of an action; minimizing impacts by limiting the degree or magnitude of the action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and compensating for the impact by replacing or providing substitute resources or environments. The mitigation measures discussed in an EIS must cover the range of impacts of the proposal and must be considered even for impacts that by themselves would not be considered "significant." If a proposed action is considered as a whole to have significant effects, all of its specific effects on the environment must be considered, and mitigation measures must be developed where it is feasible to do so. NMFS may consider mitigation provided that the mitigation efforts do not circumvent the goals and objectives of the rulemaking or the mandate to rebuild fisheries under the Magnuson-Stevens Act.

5.6 Mitigation Measures

5.6.1 Northeast Closed Area

Preferred Alternative A4 would have neutral impacts because the measures would allow access to the Closed Area for data collection with a threshold in place to prevent excessive bycatch of bluefin tuna. Preferred Alternative A4, which would rename the “Northeastern United States Closed Area” as the “Northeastern United States Monitoring Area.” This alternative would establish a three-year evaluation period during which fishing would be allowed in the Monitoring Area. Fishing activity would be closely monitored by NMFS under a four-step process that would prohibit fishing if the fleet had to use an excessive amount of IBQ allocation to account for bluefin landings or dead discards. The Monitoring Area would remain open to pelagic longline fishing from June 1 to June 30 of 2020, 2021, and 2022 (previously, the area was closed to pelagic longline fishing during this time). However, NMFS would establish a threshold of 150,519 pounds of IBQ allocation that may be used to account for landings and dead discards of bluefin caught within the boundaries of the Northeastern United States Pelagic Longline Monitoring Area. If the IBQ allocation threshold is reached, or is projected to be reached, NMFS would file a closure notice with the Office of the Federal Register. On and after the effective date of the notice, for the remainder of the evaluation period and subsequent years after, unless NMFS determines otherwise, the Northeastern United States Pelagic Longline Monitoring Area would be closed to pelagic longline fishing.

As discussed in the description of the Preferred Alternatives in Section 5.2, NMFS has added two clarifying modifications from the DEIS to the FEIS to Preferred Alternative A4.

This alternative would have short- and long-term direct minor beneficial socioeconomic impacts. Creation of the Northeastern United States Monitoring Area is unlikely to affect total effort, and businesses that support commercial fishing such as dealers, processors, and bait and tackle suppliers are unlikely to be affected, with the exception of fuel suppliers, which is likely to be minor

adverse. Thus, no mitigation measures are necessary to address moderate adverse socioeconomic impacts.

5.6.2 Cape Hatteras Gear Restricted Area

When taken as a whole, Preferred Alternative B2 would have neutral direct ecological impacts on bluefin tuna, and neutral indirect ecological impacts to restricted species (billfish, shortfin mako, and dusky sharks) and protected species (sea turtles). As discussed in Chapter 4, most fishery participants were qualified to access to the gear restricted area. Those that did not meet access criteria may only have been denied temporarily, i.e., a single year, before being considered qualified to access the area again in a subsequent year. Therefore, no mitigation measures are necessary to address adverse ecological impacts. The preferred alternatives could, however, result in neutral to minor beneficial socioeconomic impacts for a small number of vessels from the increase in landings and in catch due to access of an opened fishing area. Cumulative direct and indirect socioeconomic impacts are likely to be neutral as changes to the gear restricted area would likely not affect fleet-wide effort or landings, dealers, processors or bait and tackle shops. Removing this restriction would remove and year-to-year uncertainty associated with access decisions. It would also address concerns raised by commercial fishermen that retaining a gear restricted area with performance based access to limit bluefin tuna interactions (which no longer restricts many active fleet participants) while at the same time requiring fishery participants to individually account for their bluefin tuna catch through the IBQ Program, is unnecessarily restrictive of pelagic longline fishery effort, particularly where overall limits on quota are established through scientifically supported quotas and subsequently enforced and monitored through a careful management regime that further divides and manages that quota at several stages. It may also provide a small number of fishermen with more options regarding fishing locations. Thus, no mitigation measures are necessary to address adverse socioeconomic impacts.

5.6.3 Gulf of Mexico Gear Restricted Area

Preferred Alternative C3 would have neutral ecological impacts because the measures would modify the gear restricted areas for the commercial fisheries. Thus, no mitigation measures are necessary to address adverse ecological impacts. Preferred Alternative C3, which would rename the "Spring Gulf of Mexico Gear Restricted Area" as the "Spring Gulf of Mexico Monitoring Area." This alternative would establish a three-year evaluation period during which fishing would be allowed in the Monitoring Area. Fishing activity would be closely monitored by the NMFS under a four-step process that would prohibit fishing if the fleet had to use an excessive amount of IBQ allocation to account for bluefin landings or dead discards. The Monitoring Area would remain open to pelagic longline fishing from April 1 through May 31 of 2020, 2021, and 2022 (previously, the area was closed to pelagic longline fishing during this time). However, NMFS would establish a threshold of 63,150 pounds of IBQ allocation that may be used to account for landings and dead discards of bluefin caught within the boundaries of the Spring Gulf of Mexico Monitoring Area. If the IBQ allocation threshold is reached, or is projected to be reached, NMFS would file a closure notice with the Office of the Federal Register. On and after the effective date of the notice, for the remainder of the evaluation period and subsequent years after, unless NMFS determines otherwise, the Spring Gulf of Mexico Monitoring Area would be closed to pelagic longline fishing.

As discussed in the description of the Preferred Alternatives in Section 5.2, NMFS has added two clarifying modifications from the DEIS to the FEIS to Preferred Alternative C3.

The inseason and annual evaluation period monitoring, the resulting evaluation report, and percent equivalence adjustments of the threshold by 55 percent in the event of a downward ICCAT

adjustment of U.S. allocation would in effect result in a mitigation measure against excessive bycatch levels of all species in the Spring Gulf of Mexico Monitoring Area. This alternative would have short- and long-term direct neutral socioeconomic impacts. This is because changing the gear restricted area to a Monitoring Area is unlikely to affect total effort, and businesses that support commercial fishing such as dealers, processors, and bait and tackle suppliers are unlikely to be affected. Thus, no mitigation measures are necessary to address adverse socioeconomic impacts.

5.6.4 Gulf of Mexico Weak Hooks

Preferred Alternative D2 would modify regulations to require vessels fishing in the Gulf of Mexico, as defined at 50 CFR 105(c), that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic Ocean, including the Caribbean Sea and the Gulf of Mexico to use weak hooks when bluefin tuna are highest in abundance from January through June and throughout their spawning season, which is from April to June. Fishermen may voluntarily choose to continue to use weak hooks when they are not required. Preferring a seasonal requirement for weak hook use would maintain the protections to adult bluefin tuna when they are most abundant in the Gulf of Mexico. As a result, no mitigation effort would be necessary as no increase in bluefin tuna mortality is expected. Target species such as swordfish and tunas are unharvested which would not have a direct ecological impact and would not require mitigation efforts. Also as a result of the preferred alternative, reductions in white marlin catch rates could be achieved and would in effect create a mitigation measure for that species. Modification of the weak hook requirement would allow greater probability of retention of large target species individuals, while still protecting spawning bluefin tuna in the spring. This alternative would have minor beneficial socioeconomic impacts. This is because changes to the weak hook requirement are unlikely to affect total effort, and businesses that support commercial fishing such as dealers, processors, and bait and tackle suppliers are unlikely to be affected. Thus, no mitigation measures are necessary to address adverse socioeconomic impacts.

5.7 Unavoidable Adverse Impacts

In general, there are no unavoidable adverse ecological impacts expected as a result of the preferred alternatives and corresponding management measures associated with pelagic longline fisheries. NMFS would continue to monitor the impact of the management measures in the preferred alternatives. Preferred alternatives A4 and C3 provide a mechanism to carefully monitor access granted to areas that have been previously closed, and outline a process to support future proposed management measures, as necessary, to avoid any unanticipated adverse impacts.

5.8 Irreversible and Irretrievable Commitment of Resources

The management measures in the preferred alternatives would not result in any irreversible and irretrievable commitment of resources. Overall, there are expected to be neutral ecological impacts because of the modification of pelagic longline regulations. The principal commitment of new resources would be related to implementation of the evaluation program for a three-year Monitoring Period, such as tracking the use of IBQ allocation within the Monitoring Areas and initiating an area closure if the thresholds specified in Chapter 4 are reached. Current data streams provide sufficient quantity and quality of data to closely track landings and discards (and corresponding IBQ allocation use). NMFS has already codified a framework for inseason management.

Removing the Cape Hatteras Gear Restricted Area is not expected to result in a commitment of resources, as it removes regulations and corresponding obligations by the agency to spatially mange the area.

Shifting from a year-round weak hook requirement to a seasonal weak hook requirement is not expected to require any new resources, and may reduce the amount of time required by enforcement agents to check gear during routine boardings.

6 Regulatory Impact Review

Rulemakings must comply with Executive Order (EO) 12866 and the Regulatory Flexibility Act (RFA). NMFS undertakes a regulatory impact review (RIR) for all regulatory actions of public interest. The RIR provides analyses of the economic benefits and costs of each alternative to the nation and the fishery as a whole. The information contained in Chapter 6, taken together with the data and analysis incorporated by reference, comprise the complete RIR.

The requirements for all regulatory actions specified in E.O. 12866 are summarized in the following statement from the order:

> *In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity), unless a statute requires another regulatory approach.*

E.O. 12866 further requires Office of Management and Budget review of proposed regulations that are considered to be "significant." A significant regulatory action is one that is likely to:

- 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 of communities.
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

6.1 Description of the Management Objectives

Please see Chapter 1 for a description of the objectives of this rulemaking.

This rulemaking specifically evaluates management measures that were intended to reduce bluefin tuna catch with pelagic longline gear (i.e., weak hooks, the Cape Hatteras and Spring Gulf of Mexico Gear Restricted Area, and the Northeastern United States Closed Area). Other management measures and time/area closures were enacted for reasons not specifically related to reducing bluefin tuna interactions and/or discards, and may be considered separately in a future rulemaking.

The objectives of this rulemaking, consistent with the objectives of the 2006 Consolidated HMS FMP and its amendments, are to:

- Continue to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear consistent with the conservation and management objectives (e.g., prevent or end overfishing, rebuild overfished stocks, manage Atlantic HMS fisheries for continuing optimum yield) of the 2006 Consolidated HMS FMP, its amendments, and all applicable laws.
- Simplify and streamline Atlantic HMS management, to the extent practicable, by reducing any redundancies in regulations established to reduce bluefin tuna interactions that apply to the pelagic longline fishery.
- Optimize the ability for the pelagic longline fishery to harvest target species quotas (*e.g.*, swordfish), to the extent practicable, while also considering fairness among permit/quota categories.

6.2 Description of the Fishery

Please see Chapter 3 for a description of the fisheries that could be affected by these management actions.

6.3 Statement of the Problem

Please see Chapter 1 for a description of the problem and need for this rulemaking.

The purpose of this regulatory amendment to update pelagic longline bluefin tuna area-based and weak hook management measures is to evaluate whether some current area-based and gear management measures are still necessary to reduce and/or maintain low numbers of pelagic longline bluefin tuna discards and interactions. This evaluation is necessary given the recent successes with the IBQ Program including the shift in management focus towards individual vessel accountability in the pelagic longline fishery; the continued underharvest of quotas in target fisheries particularly the swordfish quota; comments from the public and the HMS Advisory Panel members indicating that certain regulations may be unnecessarily restrictive of the pelagic longline fishery in limiting bluefin tuna interactions; and requests from the public and HMS Advisory panel members to reduce regulatory burden and remove duplicative regulations.

6.4 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. Chapters 3 and 7 provide additional information related to the economic impacts of the alternatives.

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

Table 6.1 summarizes the net economic benefits and cost of each of the alternatives analyzed in this EIS. Additional details and more complete analyses are provided in Chapter 4.

Table 6.1 Net Economic Benefits and Costs of Each Alternative

Alternatives	Economic Benefits	Economic Costs
Area-Based Alternatives		
Northeastern United States Closed Area		
Alternative A1: No Action.	No change in economic benefits. Under this alternative pelagic longline vessel owners could maintain their recent landings levels and corresponding revenues.	No change in economic costs. Vessels in the pelagic longline fleet could continue to be prohibited from fishing in the Northeastern United States Closed Area in the month of June.
Alternative A2: Modify the Current Northeastern United States Closed Area to Remove a Western Portion of the Closure	This reduction in extent of the Northeastern United States Closed Area could provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative could also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. There is the potential that this alternative could result in a reduction in trip length and associated fuel costs. Less fuel consumption would lower the trip cost and increase the trip profit, which may influence fishermen's decisions on fishing in the Monitoring Area. In addition, shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing.	Fishing revenue impacts for this alternative are expected to be neutral despite the predicted decrease in overall revenue. Fishing vessels could continue fishing where they are currently fishing or try fishing in the western portion of the closure.
Alternative A3: Apply Individual Performance Based Access to the Northeastern United States Pelagic Longline Closure.	Implementing performance based access could provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative would also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. There is the potential that this alternative could result in a reduction in trip length and associated fuel costs. Less fuel consumption could lower the trip cost and increase the trip profit, which may influence fishermen's decisions on fishing in the Monitoring Area. In addition, shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing.	Fishing revenue impacts for this alternative are expected to be neutral despite the predicted decrease in overall revenue. If all vessels do not meet the performance criteria, the fishing revenue from this alternative would be lower than the revenue generated under Alternative A4 and A5.

Alternative A4: Undertake a review process to evaluate the continued need for the Northeastern United States Closed Area (Preferred Alternative)	This Monitoring Area could provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative could also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. There is the potential that this alternative could result in a reduction in trip length and associated fuel costs. Less fuel consumption could lower the trip cost and increase the trip profit, which may influence fishermen's decisions on fishing in the Monitoring Area. In addition, shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing.	Fishing revenue impacts for this alternative are expected to be neutral despite the predicted decrease in overall revenue. Long-term economic impacts could depend on the result of the three-year evaluation period for this Monitoring Area. If this area remains open after three years, long-term impacts could be expected to be the same as short-term impacts.
Alternative A5: Eliminate the Northeastern United States Closed Area	The elimination of this area could provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative could also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. There is the potential that this alternative could result in a reduction in trip length and associated fuel costs. Less fuel consumption could lower the trip cost and increase the trip profit, which may influence fishermen's decisions on fishing in the Monitoring Area. In addition, shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing.	Fishing revenue impacts for this alternative are expected to be neutral despite the predicted decrease in overall revenue.
Cape Hatteras Gear Restricted Area		
Alternative B1: No Action.	No change in economic benefits. This alternative could maintain the recent landings levels and corresponding revenues.	No change in economic costs. Retaining the gear restricted area could have temporary, minor adverse economic impacts to individual vessels that either recently made sets in the gear restricted area or may be denied access in the future.
Alternative B2: Eliminate the Cape Hatteras Gear Restricted Area	Removing the gear restricted area is likely to have neutral to minor and beneficial economic impacts, depending on the scale of consideration. Fleet-wide effects on fishing	No change in economic costs.

(Preferred Alternative)	revenue for this time period are anticipated to be neutral as the majority of the fleet had access to the area and continued to fish in it following implementation of Amendment 7 management measures. Removing the closures could enable greater flexibility for fishermen to safely conduct fishing activities in short, favorable wintertime weather windows.	
Spring Gulf of Mexico Gear Restricted Areas		
Alternative C1: No Action	No change in economic benefits. This alternative could maintain the recent landings levels and corresponding revenues.	No change in economic costs. Vessels in the pelagic longline fleet could continue to be prohibited from fishing in the Spring Gulf of Mexico Gear Restricted Areas in the months of April and May.
Alternative C2: Apply individual performance based access to the Spring Gulf of Mexico Gear Restricted Area.	Implementing performance based access could provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative would also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. There is the potential that this alternative could result in a slight reduction in trip length and associated fuel costs.	There could be a slight decrease in revenues within the Spring Gulf of Mexico Gear Restricted Area. If not, all vessels meet the performance criteria, the fishing revenue from this alternative would be lower than the revenue generated under Alternative C3 or C4.
Alternative C3: Undertake a review process to evaluate the continued need for the Spring Gulf of Mexico Gear Restricted Area (Preferred Alternative)	These Monitoring Areas could provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative could also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. There is the potential that this alternative could result in a slight reduction in trip length and associated fuel costs.	Fishing revenue impacts for this alternative are expected to neutral to slightly positive. Long-term economic impacts could depend on the result of the three-year evaluation period for this Monitoring Areas. If these areas remain open after three years, long-term impacts could be expected to be the same as short-term impacts.
Alternative C4: Eliminate the Spring Gulf of Mexico Gear Restricted Area	Since this alternative would allow access to all vessels by removing regulations related to the Spring Gulf of Mexico Gear Restricted Area, the short-term economic impacts would be the same as presented in the preferred alternative, C3. The elimination of these areas could provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target	Fishing revenue impacts for this alternative are expected to neutral to slightly positive. Long-term economic impacts are expected to be the same.

	catch. This alternative could also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. There is the potential that this alternative could result in a slight reduction in trip length and associated fuel costs.	
Gulf of Mexico Weak Hook Alternatives		
Alternative D1: No Action	No change in economic benefits.	No change in economic costs. The IBQ program provides adequate protection for Gulf of Mexico bluefin tuna and year-round weak hook use may be duplicative in conservation efforts and reduce fishermen's flexibility.
Alternative D2: Seasonal requirement for Weak Hooks (Preferred Alternative)	This alternative would likely result in short- and long-term minor economic benefits since it would give fishermen more flexibility in choosing how to fish. During the months without the weak hook requirement, fishermen could choose whether to use the gear based on their knowledge of bluefin tuna presence and distribution. There may be potential economic benefits for recreational fishermen that fish for white marlin or roundscale spearfish as a result of the anticipated decrease in catch rates and associated fishing mortality.	There could be no change in economic costs. Weak hooks can help fishermen manage their IBQ allocation by reducing the number of captured bluefin tuna that would be counted against their IBQ allocation, so there is some risk that switch away from weak hooks could increase costs associated with IBQ allocation usage if the switch caused an increase in bluefin tuna interactions.
Alternative D3: Remove the Weak Hook Requirement	This alternative would likely result in short- and long-term minor economic benefits since it would give fishermen more flexibility in choosing how to fish. In the absence of a weak hook requirement, fishermen could choose whether to use the gear based on their knowledge of bluefin tuna presence and distribution. There may be potential economic benefits for recreational fishermen that fish for white marlin or roundscale spearfish as a result of the anticipated decrease in catch rates and associated fishing mortality.	Although this alternative would increase fishermen's flexibility in fishing techniques, NMFS does not prefer this alternative at this time because the required use of weak hooks could help fishermen manage their IBQ allocation by reducing the number of captured bluefin tuna that would be counted against their IBQ allocation.

6.6 Conclusions

As noted above, 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; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order. Pursuant to the procedures established to implement section 6 of E.O. 12866, the Office of Management and Budget has determined that this action is not significant. A summary of the expected net economic benefits and costs of each alternative, which are based on supporting text in Chapter 4, can be found in Table 6.1.

7 Final Regulatory Flexibility Analysis

The Final Regulatory Flexibility Analysis (FRFA) is conducted to comply with the Regulatory Flexibility Act (5 U.S.C. §§ 601 et seq.) (RFA). The goal of the RFA is to minimize the economic burden of federal regulations on small entities. To that end, the RFA directs federal agencies to assess whether a proposed regulation is likely to result in significant economic impacts to a substantial number of small entities, and identify and analyze any significant alternatives to the proposed rule that accomplishes the objectives of applicable statutes and minimize any significant effects on small entities. Certain data and analyses required in a FRFA are also included in other Chapters of this document. Therefore, this FRFA incorporates by reference the economic analyses and impacts in Chapters 3, 4 and 6 of this document.

This FRFA has been updated from the Initial Regulatory Flexibility Analysis (IRFA) published in the DEIS to reflect analyses that were updated with the inclusion of an additional year of data (2018). During the analysis of the DEIS there was a calculation error associated with revenue estimates for the Northeastern United States Closed Area. The revenue calculations for all the alternatives related to the Northeastern United States Closed Area inadvertently omitted the prices for each of the target species (resulting in a default value of $1 per pound). This error resulted in the underestimate of revenue for these alternatives. Irrespective of the calculation error, the estimated change in revenue associated with the proposed alternatives presented in the FEIS falls within a similar range to those presented in the DEIS, when compared to the no action alternative.

7.1 Statement of the Need for and Objectives of this Final Rule

Section 604(a)(1) of the RFA requires a succinct statement of the need for and objective of the rule. Please see Chapter 1 for a full description of the need for and objectives of this action.

The objectives of this rulemaking, consistent with the objectives of the 2006 Consolidated HMS FMP and its amendments are to:

- Continue to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear consistent with the conservation and management objectives (e.g., prevent or end overfishing, rebuild overfished stocks, manage Atlantic HMS fisheries for continuing optimum yield) of the 2006 Consolidated HMS FMP, its amendments, and all applicable laws.
- Simplify and streamline Atlantic HMS management, to the extent practicable, by reducing any redundancies in regulations established to reduce bluefin tuna interactions that apply to the pelagic longline fishery.
- Optimize the ability for the pelagic longline fishery to harvest target species quotas (*e.g.*, swordfish), to the extent practicable, while also considering fairness among permit/quota categories.

This evaluation is necessary given the IBQ Program's shift in management focus towards individual vessel accountability for bluefin tuna bycatch in the pelagic longline fishery; the continued underharvest of quotas in the associated target fisheries, particularly the swordfish quota; comments from the public and the HMS Advisory Panel members indicating that certain

regulations may be redundant in effect (i.e., not all of the conservation and management measures currently in place are needed to achieve the objectives established in Amendment 7 for appropriately managing and limiting bluefin tuna bycatch in the pelagic longline fishery); and requests from the public and HMS Advisory Panel members to reduce regulatory burden where regulations are duplicative in effect.

7.2 A Summary of the Significant Issues Raised by the Public Comments in Response to the Initial Regulatory Flexibility Analysis, a Summary of the Agency's Assessment of Such Issues, and a Statement of Any Changes Made in the Rule as a Result of Such Comments

Section 604(a)(2) requires that a FRFA include a summary of significant issues raised by public comment in response to the IRFA and a summary of the assessment of the Agency of such issues, and a statement of any changes made in the rule as a result of such comments. NMFS did not receive any comments specifically on the IRFA, however the Agency did receive some comments regarding the anticipated or perceived economic impact of the rule. The comments included below are those that pertain specifically to such economic impacts. All of the comments and responses to the comments are summarized in Appendix F of the FEIS.

Comment: NMFS received a comment that the reduction in the number of active pelagic longline vessels and fishing effort began before gear restricted areas were implemented, and that the gear restricted areas were not the cause of such reduction.

Response: NMFS agrees that decreases in the number of active vessels and effort, landings, and revenue began prior to the implementation of the gear restricted areas under Amendment 7 in 2015. Table 1.1 in the FEIS (which shows data from 2012 through 2018) indicates that a decrease in estimated pelagic longline revenue and effort started prior to implementation of Amendment 7 despite efforts to revitalize the U.S. swordfish fishery for a number of years. Prior to initiation of this action, NMFS received suggestions from the public to consider the regulatory burden on the pelagic longline fleet and, at minimum, to evaluate whether current regulations are still needed to achieve management objectives. While the gear restricted areas may not be the sole factor influencing recent trends in the fleet, NMFS has received public comment noting that the collective regulatory burden may have had a role in decreasing the number of active vessels, effort, landings, and revenue of some target species (e.g., swordfish).

Comment: NMFS received comments that reopening the closed areas and implementing a seasonal weak hook requirement would result in higher numbers of billfish interactions from pelagic longline fishing activity that could in turn reduce numbers of billfish in these areas. Such reductions in billfish would adversely affect Atlantic HMS tournaments and the jobs created by the recreational fishing industry.

Response: NMFS disagrees that implementing the preferred alternatives would increase bycatch mortality in a manner inconsistent with stock assessments or inconsistent with the requirement that NMFS minimize bycatch and bycatch mortality to the extent practicable. Given the results of these analyses, which do not imply a large increase in the number of

interactions with most billfish species, NMFS does not anticipate that implementing the preferred alternatives would adversely affect the billfish stocks in the Gulf of Mexico. NMFS therefore disagrees that allowing pelagic longline vessels access to these areas would adversely affect fishing tournaments or reduce jobs associated with recreational fishing.

Comment: NMFS received comments that any increased bluefin tuna landings from the pelagic longline fishery that result from having access to previously closed areas or gear restricted areas will negatively impact market prices of bluefin caught in directed fisheries.

Response: Increased landings of bluefin tuna can have localized impacts on market prices if the landings are concentrated geographically and increase dramatically over a short period of time. However, the pelagic longline fleet only lands approximately 8.7% (88.1 metric tons) of total Atlantic landings of 1012.2 metric tons (based on 2018 data). Often the global market for bluefin tuna has a more direct impact on the market prices for bluefin caught by the US Atlantic directed fisheries than any change in US Atlantic bluefin tuna incidental landings

Comment: NMFS received comments in opposition to making regulatory changes to the Spring Gulf of Mexico Gear Restricted Area, noting that the Spring Gulf of Mexico Gear Restricted Area has not had adverse economic impacts on the pelagic longline fleet. Comments also noted that the preferred alternative was bad for fishermen due to a decrease in the estimated pelagic longline revenue as a result of implementing the preferred alternative (according to the impacts analysis presented in the DEIS.

Response: The analysis of socio-economic impacts of Spring Gulf of Mexico Gear Restricted Area alternatives in Chapter 4 of the FEIS includes quantitative estimates of average annual revenues. These analyses were updated with an additional year of data in the FEIS and reflect a range of potential annual revenues for Longline category permitted vessels fishing in the Gulf of Mexico generated from select target species and incidentally-caught bluefin tuna. For the No Action alternative, such annual revenue in April and May (2015-2018) averaged approximately $677,007. For Preferred Alternative C3, the estimated range of potential revenues is between $538,151 and $687,962.

NMFS acknowledges that much of this range reflects a decrease in potential revenue from the Preferred Alternative compared to the No Action alternative. We expect, however, that fishermen would operate to optimize their revenues. Access to the Spring Gulf of Mexico Monitoring Area will give fishermen the opportunity to make decisions about where to fish depending on fish availability, and the flexibility to fish in areas that optimize target catch while minimizing bycatch. If swordfish and yellowfin tuna landings in the Gulf of Mexico decrease due to shifting effort into the Monitoring Areas, then fishermen would likely continue fishing outside of the areas. Thus, we expect that revenue results would bear out at the high end of the range.

NMFS disagrees that the Spring Gulf of Mexico Gear Restricted Area has not had adverse economic impacts on pelagic longline fishermen. In addition to the quantitative analyses, pelagic longline fishermen have commented during this rulemaking process that there are adverse economic impacts and regulatory burdens associated with complying with the number of regulations and restrictions on the fishery. During the effective period of the Spring Gulf of Mexico Gear Restricted Area, pelagic longline fishermen in the northern Gulf of Mexico must conduct fishing operations around the geographic patchwork of the Spring Gulf of Mexico Gear Restricted Area's two designated areas as well as the Desoto Canyon closure (See Figure 3.4.). These restrictions on

available fishing grounds limit operational flexibility and fishermen cannot react as quickly to changing conditions--a particularly variable factor when fishing for highly migratory species such as bluefin tuna, yellowfin tuna, and swordfish. This, in turn, means that they cannot make decisions to best increase revenue and best avoid potential costs associated with accounting for incidental bluefin tuna catch. Fishermen have also reported general operational costs of having to move to fishing grounds farther away and incurring fuel and opportunity costs given the additional time that can be needed.

Given that we have concluded that all of the measures in place are likely not needed to continue to appropriately limit incidental catch in the pelagic longline fishery as first established in Amendment 7, it is appropriate for the agency to consider this feedback in examining how to relieve regulatory burden on individuals, minimize costs, and avoid unnecessary regulatory duplication. See 16 U.S.C. 1851(a)(7) (National Standard 7). This is consistent with the guidelines, which specify that management measures should be designed "to give fishermen the greatest possible freedom of action in conducting business and pursuing recreational opportunities that are consistent with ensuring wise use of the resources and reducing conflict in the fishery."

Comment: NMFS received comments that a weak hook requirement from January through June would continue to severely impact the winter swordfish fishery in the eastern Gulf of Mexico. Comments indicated that there has been a large reduction in swordfish landings in the eastern Gulf of Mexico winter swordfish fishery; that there is no conservation value to maintaining this regulation in the eastern Gulf of Mexico; and that the loss of revenue is making it harder to find crew for longline boats. NMFS received comments suggesting that NMFS create a new spatially managed area in the southeastern Gulf of Mexico where weak hook use would not be required. NMFS also received comments suggesting that the monofilament on swordfish leaders that have straightened hooks are usually very opaque instead of clear, which may indicate physical stress on the line from a swordfish bill striking the leader as the escaped fish reacts to being hooked. One commenter estimated their 2017 losses at 5,000-6,000 lb of swordfish, with an estimated value of $30,000.

Response: NMFS investigated catch rates of several target species occurring in the area in the eastern Gulf of Mexico delineated by several pelagic longline fishermen during the development of the FEIS. Appendix D of the FEIS includes this data analysis. NMFS compared catch rates from the area from 2009-2011 (3 years prior to weak hook implementation; 2011 included since weak hooks were not mandatory until May) and 2015-2017 (3 years after implementation). Overall catch rates and landings of swordfish were annually variable from before and after implementation of weak hooks. Although variable from year to year data suggested landings and catch rates have not changed in this area since implementation of weak hooks in the Gulf of Mexico.

NMFS also analyzed bluefin tuna landings and dead discard catch rates and catch numbers. Bluefin tuna catches were slightly higher in the eastern Gulf of Mexico area delineated by several pelagic longline fishermen prior to the implementation of weak hooks. Since higher catch rates were experienced prior to implementation of weak hooks, there is likely to be a continued conservation benefit to retaining a seasonal weak hook requirement in the area shown in Appendix E of the FEIS because bluefin tuna are likely to still occur in the eastern Gulf of Mexico.

Comment: NMFS received comments regarding a seasonal weak hook requirement stating that there is a substantial expense in changing gear type in labor and materials. Financial burden is not just associated with the cost of hooks. As shown in Chapter 3, Figure 3.2 and 3.3, pelagic longline gear consists of a mainline suspended in the water column, from which branch lines (which hang off

the mainline and are used to suspend hooks in the water column). Monofilament line is used widely for both the mainline (the longline) and branchlines. Branchlines may incorporate a section of line (of variable length) known as a leader, with a lead weight at one end and the baited hook at the other. Commenters noted that they must purchase a different, stretchy type of leader to deploy with weak hooks that keep small swordfish from straightening the hooks. NMFS received comments that there is an impracticality to carrying double gear and/or storing the non-weak hook gear shoreside. Its takes a full crew two days to change out the gear. Additionally, because of regulations, the hooks must be corrosive and the aluminum crimps will eventually fail; extra supplies to support the deployed hook of choice are needed to be stored onboard. Few boats in the fishery have the deck capacity to carry double gear.

Response: NMFS disagrees with this comment because fishermen may fish with weak hooks in the Gulf of Mexico for the entire year if they wish to do so. The removal of the requirement for the July-December time period does not prohibit the use of weak hooks during that period. If fishermen find that using weak hooks throughout the year is less burdensome they may do so. NMFS recognizes that vessels that fish outside the Gulf of Mexico, may not be rigged with weak hooks and would need to re-rig their gear to use weak hook when the requirement is in effect. Due to little change in the catch and catch rates of swordfish in the Gulf of Mexico and the conservation benefit afforded to bluefin tuna when spawning, NMFS is at this time preferring a seasonal requirement. NMFS also notes that currently in the entire Gulf of Mexico, all vessels with pelagic longline onboard must only possess weak circle hooks 50 CFR § 635.21(c)(5)(iii)(B)(2)(i) (with limited exception when greenstick gear is also onboard).

7.3 Description and Estimate of the Number of Small Entities to Which the Final Rule Would Apply

Section 604(a)(4) of the RFA requires Agencies in the FRFA to provide an estimate of the number of small entities to which the rule would apply. The Small Business Administration (SBA) has established size criteria for all major industry sectors in the United States, including fish harvesters. Provision is made under the SBA regulations for an agency to develop its own industry-specific size standards after consultation with SBA Office of Advocacy and an opportunity for public comment (see 13 CFR 121.903(c)). Under this provision, NMFS may establish size standards that differ from those established by the SBA Office of Size Standards, but only for use by NMFS and only for the purpose of conducting an analysis of economic effects in fulfillment of the agency's obligations under the RFA. To utilize this provision, NMFS must publish such size standards in the Federal Register, which NMFS did on December 29, 2015 (80 FR 81194; December 29, 2015). In that final rule, which became effective on July 1, 2016, NMFS established a small business size standard of $11 million in annual gross receipts for all businesses in the commercial fishing industry (NAICS 11411) for RFA compliance purposes. NMFS considers all HMS permit holders to be small entities because they had average annual receipts of less than $11 million for commercial fishing. The Small Business Administration (SBA) has established size standards for all other major industry sectors in the U.S, including the scenic and sightseeing transportation (water) sector (NAICS code 487210, for-hire), which includes charter/party boat entities. The SBA has defined a small charter/party boat entity as one with average annual receipts (revenue) of less than $7.5 million.

Regarding those entities that would be directly affected by the preferred alternatives, the average annual revenue per active pelagic longline vessel is estimated to be $187,000 based on the 170 active vessels between 2006 and 2012 that produced an estimated $31.8 million in revenue annually. The maximum annual revenue for any pelagic longline vessel between 2006 and 2016 was less than $1.9 million, well below the NMFS small business size standard for commercial fishing businesses of $11 million. Other non-longline HMS commercial fishing vessels typically generally earn less revenue than pelagic longline vessels. Therefore, NMFS considers all Atlantic HMS commercial permit holders to be small entities (i.e., they are engaged in the business of fish harvesting, are independently owned or operated, are not dominant in their field of operation, and have combined annual receipts not in excess of $11 million for all its affiliated operations worldwide). The preferred commercial alternatives would apply to the 280 Atlantic tunas Longline category permit holders, 221 directed shark permit holders, and 269 incidental shark permit holders. Of these 280 Atlantic tunas Longline category permit holders, 85 pelagic longline vessels were actively fishing in 2016 based on logbook records.

NMFS has determined that the proposed measures would not likely directly affect any small organizations or small government jurisdictions defined under RFA, nor would there be disproportionate economic impacts between large and small entities.

More information regarding the description of the fisheries affected can be found in Chapter 3.0 of the DEIS.

7.4 Description of the Projected Reporting, Record-Keeping, and Other Compliance Requirements of the Proposed Rule, Including an Estimate of the Classes of Small Entities Which Would be Subject to the Requirements of the Report or Record

Section 604(a)(5) of the RFA requires Agencies in the FRFA to describe any new reporting, record-keeping and other compliance requirements. The action does not contain any new collection of information, reporting, or record-keeping requirements.

7.5 Description of the Steps the Agency Has Taken to Minimize the Significant Economic Impact on Small Entities Consistent with the Stated Objectives of Applicable Statutes

Under section 604(a)(6) of the RFA requires Agencies in the FRFA to describe the steps taken to minimize the significant economic impact on small entities consistent with the stated objectives of applicable statutes, including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected. These impacts are discussed below and in Chapters 4 and 6 of this document.

7.5.1 Northeastern United States Closed Area

Alternative A1, the No Action alternative, would maintain the current regulations regarding the Northeastern United States Closed Area. The currently defined area would remain closed to all vessels using pelagic longline gear onboard from June 1 through June 30 of a given year. Average annual revenue for bluefin tuna and target species combined during this time period in the surrounding open reference area was $178,847. Since 16 vessels operated in this area in June between 2015 and 2018, the average annual revenue per vessel during this time period was $11,178. This alternative would maintain the recent landings levels and corresponding revenues, resulting in neutral direct economic impacts to these small entities. This alternative does not balance the objective of appropriately managing and limiting bluefin bycatch in the pelagic longline fishery and the requirement to provide vessels with a reasonable opportunity to harvest available target species quotas consistent with objectives of this rulemaking and those established in Amendment 7. Retaining, or not evaluating continued need for, a closed area intended to limit bluefin tuna discards while at the same time requiring fishery participants to individually account for their incidental bluefin tuna catch with IBQ allocation appears to be redundant in effect. Not all of the regulations currently in place appear to be needed to appropriately limit incidental catch of bluefin tuna in the pelagic longline fishery, and maintaining all of the restrictions may unnecessarily restrict pelagic longline fishery effort and create unnecessary regulatory burden for fishery participants. Furthermore, NMFS is required under ATCA and the Magnuson-Stevens Act to give fishing vessels a reasonable opportunity to harvest the ICCAT quotas. See16 U.S.C. § 1854(g)(1)(D). The gear restricted areas, if no longer necessary to manage bluefin incidental catch, may unnecessarily restrict the longline fleet in this regard. Therefore, this alternative is not preferred at this time.

Alternative A2 would modify the current Northeastern United States Closed Area to remove portions of the closure (i.e., those areas west of 70º W longitude) that current analyses indicate: 1) did not historically have high numbers of bluefin discards reported in the HMS logbook during the timeframe of data (1996-1997) originally analyzed for implementation of the closure in 1999, and 2) were adjacent to areas that recently (2015-2018) did not have bluefin interactions. Total average annual revenue for bluefin tuna and target species in June of 2015 through 2018 was $178,847. The predicted range of total average annual revenue under this alternative would be $172,389. As mentioned above regarding Alternative A1, in the reference area, total average annual revenue for the 16 vessels for bluefin tuna and target species in June of 2015 through 2018 was $$11,178 per vessel. The predicted total average annual revenue under Alternative A2 would be $10,774 per vessel). Under Alternative A2, revenue from most species is predicted to decrease during the month of June, particularly for swordfish. Revenue from bigeye tuna, on the other hand, could increase slightly. Some of the analyses in the FEIS predicted that, if fishing effort moved directly and proportionately from the now-open areas to the newly-opened areas, catch rates could be lower for most species, and revenue would also be lower. This analysis rests, however, on the presumption of direct movement of the same levels of effort from one area to the other. It does not account for a critical element of fishing behavior that is determinative of how and where effort changes would actually occur under this rule: namely, fishermen selection of productive fishing grounds. In practical application, we expect that fishermen would make decisions about productive fishing grounds and move their effort responsively and accordingly, thus offsetting any impact that the change in area could otherwise produce. Fishermen will make decisions about productive fishing grounds in any given year depending on fish availability and will likely decide not to fish in the area being considered for opening if they discover it could lower their fishing revenue. Thus, fishing revenue impacts for this alternative are expected to be neutral. Given the low numbers of expected target catch in the area that could be opened under this alternative, this alternative would not provide access to areas historically known to have higher rates of target species catch within the modified Northeastern United States Closed Area. Also, this alternative does not provide an evaluative mechanism for the modified Northeastern United States Closed Area that would remain closed, available fishery data for this area is over 20 years old, and there are considerable differences in management strategies for the fishery. The preferred alternative to remove the Cape Hatteras Gear Restricted Area is consistent with the objective of this action to "simplify and streamline HMS management by reducing redundancies in regulations" given that it appears that not all of the regulations in place are necessary to appropriately limit incidental bluefin tuna catch in the pelagic longline fishery within the limits established in Amendment 7. Therefore, NMFS is not preferring Alternative A2 at this time.

Alternative A3 considered converting the Northeastern United States Closed Area to the "Northeastern United States Gear Restricted Area," and allowing performance-based vessel access therein using the access criteria currently used for the Cape Hatteras Gear Restricted Area (currently codified at §§ 635.21(c)(3) and 635.14). Vessels would be evaluated against criteria (i.e., performance metrics) evaluating a vessel's ability to avoid bluefin tuna, comply with Pelagic Observer Program requirements, and comply with HMS logbook submission requirements using the three most recent years of available data associated with a vessel. If no data are available, then NMFS would not be able to make a determination about vessel access, and such vessels would be excluded from gear restricted area access until NMFS has collected sufficient data for assessment (consistent with current procedures for the Cape Hatteras Gear

Restricted Area). Those vessels that meet the criteria for performance metrics would be allowed to fish in the closed area. This measure would be evaluated after at least three years of data have been collected to determine whether it effectively achieves the management objectives of this rulemaking.

Total average annual revenue for bluefin tuna and target species in June of 2015 through 2018 was $178,847, which is on average $11,178 per vessel for the 16 vessels fishing in that area. The predicted range of average annual revenue per vessel during this time period under this alternative would be $5,720 to $12,140. Revenue from some species is predicted to decrease during the month of June, particularly for swordfish and dolphin, because anticipated catch rates for some species in the Northeastern United States Gear Restricted Area were lower than those in the reference area. Revenue from yellowfin tuna, on the other hand, could increase substantially. Some of the analyses in the FEIS predicted that, if fishing effort moved directly and proportionately from the now-open areas to the newly-opened areas, catch rates could be lower for most species, and revenue would also be lower. This analysis rests, however, on the presumption of direct movement of the same levels of effort from one area to the other. It does not account for a critical element of fishing behavior that is determinative of how and where effort changes would actually occur under this rule: namely, fishermen selection of productive fishing grounds. In practical application, we expect that fishermen would make decisions about productive fishing grounds and move their effort responsively and accordingly, thus offsetting any impact that the change in area could otherwise produce. Fishermen will make decisions about productive fishing grounds in any given year depending on fish availability and will likely decide not to fish in the Northeastern United States Closed Area if they qualify for access and discover it could lower their fishing revenue. Thus, fishing revenue impacts for this alternative are expected to be neutral.

Implementing performance-based access would provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch.

An unquantified short-term economic benefit of this alternative is a reduction in trip length and associated fuel cost. The Northeastern United States Gear Restricted Area would open areas for qualified pelagic longline vessels that are closer to shore than where most of the effort is currently occurring during the month of June in the adjacent open areas. The closure is approximately 320 miles wide from west to east, so allowing fishing in the area could reduce some trips by hundreds of miles. Less fuel consumption would lower the trip cost and increase the trip profit, which may influence fishermen's decisions on fishing in the Monitoring Area. In addition, shorter trip lengths could also reduce the opportunity costs for crew and captains on the vessel by reducing the number of days they are away at sea fishing.

In the short-term, overall economic impacts are expected to range between minor positive to neutral based on the increased flexibility in fishing areas, potentially shorter trips and associated lower fuel costs, and thus potentially increased profits from fishing. Although this alternative would allow access to most pelagic longline vessels in the short-term, over time if fewer vessels are qualified for access to the area it could reduce the amount of data collection from the area.

This alternative does not present much difference in ecological or socioeconomic impacts from opening this area as a Monitoring Area (Alternative A4) or eliminating the Closed Area (Alternative A5). Depending on the access levels, this alternative may not meet the objectives of optimizing the ability of the pelagic longline fleet to harvest target species. For these reasons, NMFS does not prefer this alternative at this time.

Alternative A4, the preferred alternative, would convert the "Northeastern United States Closed Area" to a monitoring area, called the "Northeastern United States Pelagic Longline Monitoring Area." This area has been closed to pelagic longline fishing during the month of June since 1999. This alternative would have a three-year evaluation period for the Monitoring Area, which would be managed as follows:

- The Monitoring Area would initially remain open to pelagic longline fishing from June 1 to June 30.
- There would be an annual 150,519 pound IBQ allocation threshold for landings and dead discards of bluefin tuna caught within the Monitoring Area.
- If the threshold is reached, or is projected to be reached, NMFS would file a closure notice for the Monitoring Area with the Office of the **Federal Register**.
- On and after the effective date of the notice, the Monitoring Area would be closed to pelagic longline fishing each year from June 1 through June 30, unless NMFS takes further action.
- If no closure notice is filed between June 1, 2020 and December 31, 2022, the Monitoring Area would remain open, unless and until NMFS decides to take additional action regarding the area.

The 150,519 lb threshold is based on the average annual amount of unused Atlantic IBQ allocation that is available for use by the pelagic longline fleet from June 1 through December 31. Using unused allocation as the threshold helps to ensure that opening the area to fishing would not compromise adherence to the overall bluefin quota or the ability of fishery participants to obtain enough IBQ allocation to cover bluefin landings and dead discards for the rest of the year. It should be noted that the threshold does not mean that 150,519 lb of IBQ allocation can be used only in the Monitoring Area. IBQ allocation is still subject to the same regulations previously applicable. The threshold is for NMFS' monitoring and evaluation purposes of the Monitoring Area only. After the 2020-2022 evaluation period, NMFS will evaluate data collected from the Monitoring Area and compile a report. Based on the findings of the report, NMFS may then decide to initiate a follow-up action to implement new, longer-term management measures for the area. As discussed in Chapters 2 and 4 of the FEIS, the status of the Monitoring Area following the three-year evaluation period is dependent on whether the threshold has been reached in any of those three years.

NMFS received comment suggesting that if the ICCAT western Atlantic bluefin tuna quota, and thus the U.S. allocation of bluefin quota, were to be adjusted upwards by ICCAT, maintaining a threshold based on a designated poundage would make the threshold disproportionately small in relation to the new quota. NMFS agrees that using a percentage as well as a specific poundage for management of the monitoring areas may be appropriate. However, given the concerns expressed by the public about the uncertain ecological effects of pelagic longline fishing in the

Spring Gulf of Mexico Gear Restricted Area and the Northeastern United States Closed Area, NMFS prefers to take a more conservative approach to managing these areas and only make adjustments based on a percentage if the U.S. allocation is adjusted downwards by ICCAT. The 150,519 lb threshold is equivalent to 72 percent of the Atlantic IBQ allocation issued to the fleet in 2018. If the ICCAT quota is adjusted downward, the threshold would also be adjusted downward, to reflect a percentage of overall IBQ allocation commensurate with the current threshold (i.e., 72 percent of the new Atlantic IBQ allocation disbursed to the fleet, the equivalent percentage of the current threshold in relation to the overall available IBQ allocation).

This Monitoring Area will provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices about where to fish to optimize target catch while minimizing bycatch. An unquantified benefit of this alternative could be a reduction in trip length and associated fuel cost. The alternative would open areas for pelagic longline fishing that are closer to shore than where most of the effort is currently occurring during the month of June in the adjacent open areas. The short-term economic impacts would be very similar to those of Alternative A3. Long-term economic impacts would depend on the result of the three-year evaluation period for this Monitoring Area. If NMFS were to decide to take action so that these areas remain open after three years, long-term impacts would be expected to be the same as short-term impacts.

This alternative is consistent with the objectives of optimizing the ability of the pelagic longline fleet to harvest target species, because it provides a carefully controlled mechanism to allow fishermen back into areas that were previously closed. This alternative also helps with the uncertainty due to lack of data from within the closed area as to whether the area is still appropriately located or needed to meet bluefin tuna management objectives. This alternative gives fishermen more flexibility to determine where to fish to optimize target catch in the region encompassing the Northeastern United States Closed Area. This alternative would also be expected to have neutral ecological impacts on bluefin tuna, as it provides measures to minimize bluefin tuna bycatch via the threshold and evaluative aspects of the program. It should allow the pelagic longline fishery vessels to continue fishing from January through May, within the same levels of IBQ allocation usage (2015-2018), and have a threshold level that provides both sufficient opportunities for fishermen to target swordfish, yellowfin tuna, bigeye tuna, as well as other pelagic species, and limits catch of bluefin tuna while the Monitoring Area is effective. The individual accountability aspects of the IBQ Program would still be relied upon to incentivize bluefin tuna avoidance, meaning that there is still a proven means to achieve the objectives of continuing to minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS. In addition, this alternative simplifies and streamlines regulations in the Atlantic intended to reduce bluefin tuna, and is therefore consistent with that corresponding objective for this rulemaking. For these reasons this alternative is preferred at this time.

Alternative A5 would eliminate all current restrictions associated with the Northeastern United States Closed Area. Since this alternative would allow access to all vessels in the month of June by removing regulations related to the Northeastern United States Closed Area, the socioeconomic impacts would be the same as presented in the preferred alternative, Alternative A4. In the long-term, overall economic impacts are expected to range between minor positive to

neutral based on the increased flexibility in fishing areas, potentially shorter trips and associated lower fuel costs, and thus potentially increased profits from fishing.

Elimination of the Northeastern United States Closed Area is anticipated to have similar impacts as the evaluative option (Alternative A4), and the modification of the Northeastern United States Closed Area (Alternative A3). However, NMFS is not preferring this alternative at this time, given uncertainty with the catch estimates in the analysis and inability to quickly restrict fishing if bycatch impacts to the bluefin tuna or other species are beyond acceptable levels. This alternative also does not provide an automatic mechanism for NMFS to initiate the review of the impacts of opening the area. This alternative does not align with the objective of adequately conserving and managing the bluefin tuna stock and minimizing bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS with the lack of NMFS ability to quickly restrict fishing if bycatch levels of any Atlantic HMS are beyond acceptable levels. This alternative is not preferred at this time.

7.5.2 Cape Hatteras Gear Restricted Area

Alternative B1, the No Action alternative, would maintain the current boundaries and restrictions associated with the Cape Hatteras Gear Restricted Area. Access to the area would be based on an evaluation of performance metrics. Since implementation of the program, the majority of the pelagic longline fleet has been granted access to the gear restricted area. However, the number of permit holders with data available for analysis has declined, coincident with an increase in the number of permits in "NOVESID" status (i.e., permits are renewed but not associated with a vessel). In the first year of the program, 136 vessels (~48 percent of the 281 pelagic longline permits) were determined to have sufficient data for the analysis, while 145 permits were either in NOVESID status, were inactive during the initial analysis period, or were in an invalid status. Approximately 75 percent of active vessels met criteria for access to the gear restricted area. During the 2019-2020 effective period, 89 vessels (~31.7 percent) had data available for analysis. Of these, 79 percent of active vessels met criteria for access to the gear restricted area in the 2019-2020 effective period.

Since implementation of the IBQ Program in 2015, revenue in the Cape Hatteras Gear Restricted Area for highly valued target species has increased. Although still higher than the revenue estimated for sets deployed within the Cape Hatteras Gear Restricted Area during the first two years of the program, estimated set revenue decreased by 23 percent between 2017 and 2018. These patterns likely reflect fishermen adjusting business practices to the gear restricted area and IBQ Program, and annual variability in effort, landings, and market forces. During the gear restricted area's December through April effective period, from 2015 through 2018, sets made within this gear restricted area contributed approximately 8.9 percent of the revenue generated for swordfish, 4.3 percent of the revenue from yellowfin tuna, 28.5 percent of the revenue from bigeye tuna, and 21.2 percent of the revenue from bluefin tuna.

Retaining this gear restricted area is likely to have neutral economic impacts fleet-wide, as the majority of vessels qualified for access, and those not qualified for access to the gear restricted area did not make sets within this area either prior to implementation or after implementation

when access was granted. Retaining the gear restricted area may have temporary, minor adverse economic impacts to individual vessels that either recently made sets in the gear restricted area or may be denied access in the future.

Retaining a gear restricted area with performance-based access to limit bluefin tuna interactions (which no longer restricts many active fleet participants) while at the same time requiring fishery participants to individually account for their incidental bluefin tuna catch with IBQ allocation, is unnecessarily restrictive of pelagic longline fishery effort, particularly where overall limits on quota are established through scientifically supported quotas and subsequently enforced and monitored through a careful management regime that further divides and manages that quota at several stages, including limits on the amount of IBQ allocation available Given this, NMFS determined that this alternative is not aligned with the objective to simplify and streamline HMS management. Because it does not meet all the objectives of the rulemaking, NMFS is not preferring the No Action alternative at this time.

Alternative B2 would remove the current gear restricted area off Cape Hatteras, North Carolina, as currently defined in § 635.2 and all associated regulatory provisions, restrictions, and prohibitions. Removing the gear restricted area is likely to have neutral to minor and beneficial economic impacts, depending on the scale of consideration. Fleet-wide effects on fishing revenue for this time period are anticipated to be neutral as the majority of the fleet which fished in the area met access criteria for the area and continued to fish in it following implementation of Amendment 7 management measures. Vessels that recently did not meet criteria for access (e.g., for the 2019-2020 effective period) to the gear restricted area fished in a variety of locations between 2016 and 2018. Many of these vessels did not make sets within this area either prior to implementation or after implementation when they did meet the criteria for access to the gear restricted area. Revenue for these vessels may therefore be based on factors other than access to the gear restricted area. Removing the gear restricted area may have temporary, localized and minor beneficial economic impacts to a small number of individual vessels. Removing this restriction would remove regulations that are perceived by fishery participants to be a regulatory burden and no longer necessary in tandem with the IBQ Program. It may also reduce year-to-year uncertainty associated with access decisions for fishermen that do fish in the Cape Hatteras region. These fishermen may also have more options regarding fishing locations. The gear restricted area is situated in a location where wintertime fishing activities are largely dependent on weather and wind direction. Cape Hatteras and adjacent Diamond Shoals shelter fishing grounds to the south and west from northerly and westerly winds, and to the north from southerly and westerly winds. Removing the closures could enable greater flexibility for fishermen to safely conduct fishing activities in short, favorable wintertime weather windows. Removing the Cape Hatteras Gear Restricted Area balances the objectives to optimize ability to harvest target species with continuing to minimize bycatch and bycatch mortality. It also simplifies and streamlines HMS management by reducing redundant regulations. For these reasons, this alternative is preferred at this time.

7.5.3 Spring Gulf of Mexico Gear Restricted Areas

Alternative C1, the No Action alternative, would maintain the current regulations regarding the Spring Gulf of Mexico Gear Restricted Area (comprised of two areas). NMFS would maintain

current restrictions which prohibit fishing to all vessels with pelagic longline gear onboard from April 1 through May 31 each year (vessels may transit the area if gear is properly stowed). Outside of the gear restricted area, average annual revenue for bluefin tuna and target species from April-May in 2015 through 2018 was $677,007. There were 34 pelagic longline vessels active in the Gulf of Mexico during that time period, thus each vessel generated an average of $19,912 annually between April-May. This alternative would maintain the recent landings levels and resulting revenues, resulting in neutral direct economic impacts. Although the No Action alternative could meet the objective of continuing to minimize bycatch and bycatch mortality of bluefin tuna, it does not meet the objectives of optimizing the ability of the pelagic longline fleet to harvest target species quotas or streamlining and simplifying HMS management by reducing regulations that may be redundant in effect and pose an unnecessary regulatory burden on fishery participants. For these reasons, NMFS does not prefer this alternative at this time.

Alternative C2 would apply performance-based access to the Spring Gulf of Mexico Gear Restricted Area. Vessels would be evaluated against criteria (i.e., performance metrics) evaluating their ability to avoid bluefin tuna, comply with Pelagic Observer Program requirements, and comply with HMS logbook submission requirements using the three most recent years of available data associated with a vessel. If no data are available, then NMFS would not be able to make a determination about vessel access, and such vessels would be excluded from gear restricted area access until NMFS has collected sufficient data for assessment (consistent with current operational Amendment 7 implementation procedures). Those vessels that meet the criteria for performance metrics would be allowed to fish in the closed area. This measure would be evaluated after at least three years of data have been collected to determine whether it effectively achieves the management objectives of this rulemaking. In the analyses of gear restricted area access for 2015 through 2019, up to 3 pelagic longline vessels associated with Gulf of Mexico IBQ shares did not meet criteria for access to the Cape Hatteras Gear Restricted Area in any given year, out of a total of 52 vessels associated with Gulf of Mexico IBQ shares. Those same vessels would also not meet criteria for access to the Spring Gulf of Mexico Gear Restricted Area under this alternative. Therefore, given these past access determinations, at least 94 percent of vessels with Gulf of Mexico IBQ allocation would be expected to meet criteria for access to the Spring Gulf of Mexico Gear Restricted Area under this alternative. As noted under Alternative C1, average annual revenue per vessel for bluefin tuna and target species in April-May of 2015 through 2018 was $19,912. The predicted range of average annual revenue per vessel under this alternative would be $15,828 to $20,234. Revenue from some species is predicted to decrease during these two months, particularly for swordfish, because anticipated catch rates for some species in the Gulf of Mexico Gear Restricted Area with performance access were lower than those in the open portions of the Gulf of Mexico. Revenue from bigeye tuna, on the other hand, is predicted to remain the same or increase. Some of the analyses in the DEIS predicted that, if fishing effort moved directly and proportionately from the now-open areas to the newly-opened areas, catch rates could be lower for most species, and revenue would also be lower. This analysis rests, however, on the presumption of direct movement of the same levels of effort from one area to the other. It does not account for a critical element of fishing behavior that is determinative of how and where effort changes would actually occur under this rule: namely, fishermen selection of productive fishing grounds. In practical application, we expect that fishermen would make decisions about productive fishing grounds and move their effort responsively and accordingly, thus offsetting any impact that the

change in area could otherwise produce. Fishermen will make decisions about productive fishing grounds in any given year depending on fish availability. Access to the gear restricted areas will provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. Thus, fishing revenue impacts for this alternative are expected to be neutral.

Long-term impacts on these species would depend on future trends in performance-based access to the Spring Gulf of Mexico Gear Restricted Area. If the number of vessels allowed access to these areas remains consistent over time, long-term impacts would be expected to be the same as short-term impacts. As described above, this analysis assumes that all vessels with Gulf of Mexico IBQ shares would have access to the gear restricted areas. There could be a slight decrease in revenues within the gear restricted areas from the values described here, with a corresponding increase in revenues in the open area, due to vessels excluded from the areas, but the predicted ranges of catch still represent the best estimate for these areas.

Since the majority of vessels fishing in the Gulf of Mexico would be expected to have access to the Spring Gulf of Mexico Gear Restricted Areas under this alternative, any benefit to applying performance-based access would likely be minimal. This alternative does not present much difference in ecological or socioeconomic impacts from opening these areas as Monitoring Areas (Alternative C3) or eliminating the Spring Gulf of Mexico Gear Restricted Areas (Alternative C4). In order to meet the objective of optimizing the ability of the fleet to harvest target species, this alternative would add additional, somewhat complicated regulations to the area instead of streamlining and simplifying regulations. Therefore, this alternative is not strongly aligned with the objective to streamline and simplify HMS regulations. For these reasons, NMFS does not prefer this alternative at this time.

Alternative C3, the preferred alternative, would convert the "Spring Gulf of Mexico Gear Restricted Area" to a "Spring Gulf of Mexico Pelagic Longline Monitoring Area" (which will continue to be comprised of two areas) ("Monitoring Area"). This area has been closed to pelagic longline fishing during the months of April and May since 2015. This alternative would have a three-year evaluation period (January 1, 2010 through December 31, 2022) for the Monitoring Area, which would be managed as follows:

- The Monitoring Area would initially remain open to pelagic longline fishing from April 1 through May 31.
- There would be an annual 63,150 pound IBQ allocation threshold for landings and dead discards of bluefin caught within the Monitoring Area.
- If the threshold is reached, or is projected to be reached, NMFS would file a closure notice for the Monitoring Area with the Office of the **Federal Register.**
- On or after the effective date of the notice, the Monitoring Area would be closed to pelagic longline fishing each year from April 1 through May 31, unless NMFS takes further action.
- If no closure notice is filed between April 1, 2020 through December 31, 2022, the Monitoring Area would remain open, unless and until NMFS decides to take additional action regarding the area.

The area would be closely monitored by NMFS under a process that would prohibit fishing if the fleet were to use Gulf of Mexico IBQ allocation in exceedance of an established annual threshold to account for bluefin landings or dead discards caught within the boundaries of the Monitoring Area. The 63,150 lb threshold is based on the amount of IBQ annual allocation distributed to vessels that fished in the region while the closures were effective between 2015 and 2017. NMFS decided that this was an appropriate threshold because it will accommodate for data collection in the area while keeping landings and dead discards in the fishery within the science based Longline category sub-quota. This threshold would limit the amount of IBQ that could be used to account for bluefin landings and dead discards in the monitoring area to the amount of IBQ allocation that could be used by the portion of the fleet that was recently (2015 through 2017) active during these months in the Gulf of Mexico. The intent of this threshold design is to discourage a level of fishing beyond what has recently occurred in the Gulf of Mexico. Basing the threshold for closure on the annual allocation of active vessels from 2015 to 2017 would allow pelagic longline vessels to continue fishing in the same manner as they have in the past three years, and have a threshold level that provides sufficient opportunities for fishermen to target swordfish and yellowfin and bigeye tunas while the Monitoring Area are effective. It should be noted that the threshold does not mean that 63,150 lb of Gulf of Mexico IBQ allocation can be used only in the Monitoring Area. IBQ allocation is still subject to the same regulations previously applicable. The threshold is for NMFS' monitoring and evaluation purposes of the Monitoring Area only. The 63,150 lb threshold is approximately 55 percent of the adjusted total Atlantic IBQ allocation currently distributed to the fleet. In the event that the western Atlantic bluefin tuna quota later is reduced at ICCAT and the U.S. allocation of bluefin quota is adjusted downward as a result, the threshold would also be adjusted. Such adjustment would make the threshold 52 percent of the total Gulf of Mexico IBQ allocation disbursed to the fleet as a result of the lower U.S allocation. After the 2020-2022 evaluation period, NMFS will evaluate data collected from the Monitoring Area and compile a report. Based on the findings of the report, NMFS may then decide to initiate a follow-up action to implement new, longer-term management measures for the area.

As noted under Alternative C1, average annual revenue per vessel for bluefin tuna and target species in April-May of 2015 through 2018 was $19,912. The predicted range of average annual revenue per vessel under this alternative would be $15,828 to $20,234. Revenue from some species is predicted to decrease during these two months, particularly for swordfish, because anticipated catch rates for some species in the Spring Gulf of Mexico Pelagic Longline Monitoring Area were lower than those in the open portions of the Gulf of Mexico. Revenue from bigeye tuna, on the other hand, is predicted to remain the same or increase. Some of the analyses in the DEIS predicted that, if fishing effort moved directly and proportionately from the now-open areas to the newly-opened areas, catch rates could be lower for most species, and revenue would also be lower. This analysis rests, however, on the presumption of direct movement of the same levels of effort from one area to the other. It does not account for a critical element of fishing behavior that is determinative of how and where effort changes would actually occur under this rule: namely, fishermen selection of productive fishing grounds. In practical application, we expect that fishermen would make decisions about productive fishing grounds and move their effort responsively and accordingly, thus offsetting any impact that the change in area could otherwise produce. Fishermen will make decisions about productive fishing grounds in any given year depending on fish availability and will likely decide not to fish

in the Spring Gulf of Mexico Pelagic Longline Monitoring Area if they discover it could lower their fishing revenue. The Monitoring Area will provide increased flexibility for fishermen to adapt to changing distributions and concentrations of bluefin tuna and target catch. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. Thus, fishing revenue impacts for this alternative are expected to be neutral.

Long-term economic impacts would depend on the result of the three-year evaluation period for this Monitoring Area. If NMFS decides to take action to keep these areas open after three years, long-term impacts would be expected to be the same as short-term impacts.

This alternative would give fishermen the flexibility to determine where in the Gulf of Mexico they choose to fish to optimize target catch. The individual accountability aspects of the IBQ Program would still be relied upon to incentivize bluefin tuna avoidance, meaning that there is still a proven means to achieve the objectives of continuing to minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS. In addition, this alternative simplifies and streamlines regulations in the Gulf of Mexico intended to reduce bluefin tuna, and is therefore consistent with that corresponding objective for this rulemaking. For these reasons, NMFS prefers this alternative at this time.

Alternative C4 would rename the Spring Gulf of Mexico Gear Restricted Area to the Spring Gulf of Mexico Monitoring Area. Since this alternative would allow access to all vessels by removing regulations related to the Spring Gulf of Mexico Gear Restricted Area, the short-term socioeconomic impacts would be the same as presented in the preferred Alternative C3. As noted under Alternative C1, average annual revenue per vessel for bluefin tuna and target species in April-May of 2015 through 2018 was $19,912. The predicted range of average annual revenue per vessel under this alternative would be $15,828 to $20,234. Revenue from some species is predicted to decrease during these two months, particularly for swordfish, because anticipated catch rates for some species in the Spring Gulf of Mexico Gear Restricted Area were lower than those in the open portions of the Gulf of Mexico. Revenue from bigeye tuna, on the other hand, is predicted to remain the same or increase. Overall economic impacts for this alternative are expected to be neutral in the short-term, despite the predicted decrease in overall revenue. Fishermen will make decisions about where to fish in any given year depending on fish availability. This alternative will also give fishermen the ability to make choices on where to fish to optimize target catch while minimizing bycatch. Long-term economic impacts would be expected to be the same as short-term impacts. Although this alternative gives fishermen the most flexibility to determine where in the Gulf of Mexico they choose to fish to optimize target catch and minimize bycatch under the IBQ Program, and although this alternative would be expected to have neutral ecological impacts on bluefin tuna, this alternative does not have the agency control provided by performance access in Alternative C2 or by the monitoring aspects of the evaluation process in Alternative C3, resulting in more uncertainty in the long-term. For these reasons, NMFS does not prefer this alternative at this time.

7.5.4 Gulf of Mexico Weak Hook Alternatives

Under Alternative D1, NMFS would maintain the current regulations at 50 CFR 635.21(c)(5)(iii)(B)(*2*)(*i*) requiring vessels fishing in the Gulf of Mexico, that have pelagic longline gear on board, and that have been issued, or are required to have been issued, a swordfish, shark, or Atlantic Tunas Longline category LAP for use in the Atlantic Ocean, including the Caribbean Sea and the Gulf of Mexico, to use weak hooks year-round when operating in the Gulf of Mexico. Because this alternative does not change current regulations, economic impacts on small entities would be neutral. However, this alternative would not address the higher bycatch of other species, such as white marlin that occurs in the second half of the year on weak hooks, nor would it address comments NMFS has received from pelagic longline fishermen expressing concern about their perception that swordfish catches have been reduced with weak hooks. Under this alternative, fishermen would not have any additional flexibility to choose a stronger circle hook (that also meets other existing requirements for hook size and type) that they feel may work better for their fishing operations. Weak hook research conducted by NMFS from 2008-2012 indicated that there was no significant difference in the catch rates of any targeted species when compared to previously allowed stronger circle hooks, even though the catch rates of legally sized swordfish did in fact decrease with weak hooks. This alternative is not consistent with the objective of continuing to minimize bycatch of all Atlantic HMS; because this alternative would not mitigate the adverse impacts to white marlin and roundscale spearfish when they are present in the Gulf of Mexico. NMFS does not prefer Alternative D1 at this time.

Alternative D2, the preferred alternative, would modify the regulations described under Alternative D1 to only require use weak hooks from January through June. This time period is when bluefin tuna are highest in abundance and it includes the April through June bluefin tuna spawning season. Fishermen may voluntarily choose to continue to use weak hooks when they are not required. This alternative would likely result in short- and long-term minor beneficial economic impacts since it would give fishermen more flexibility in choosing how to fish. During the months without the weak hook requirement, fishermen could choose whether to use the gear based on their knowledge of bluefin tuna presence and distribution. Furthermore, weak hooks can help fishermen manage their IBQ allocation by reducing the number of captured bluefin tuna that would be counted against their IBQ allocation. NMFS prefers this alternative at this time because it increases fishermen's flexibility and helps fishermen manage their IBQ allocation by reducing the number of captured bluefin tuna that would be counted against their IBQ allocation. There may be potential economic benefits for recreational fishermen that fish for white marlin or roundscale spearfish as a result of the anticipated decrease in commercial bycatch rates and associated fishing mortality and potential improvements to stock health and status. This alternative is expected to strike the best balance between the objectives of continuing to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna and optimize the ability for the pelagic longline fishery to harvest target species quotas. This alternative provides increased flexibility with respect to hook requirements in the second half of the year (provided basic circle hook requirements are still met). This alternative also balances the objective of reducing potentially redundant regulations against continuing to minimize bluefin tuna mortality by removing weak hook requirements in the second half of the year when weak hooks are not expected provide an ecological benefit in relation to spawning bluefin tuna. For these reasons, NMFS is preferring this alternative at this time.

Under Alternative D3, NMFS would remove the weak hook regulations described under Alternative D1. NMFS would continue to encourage voluntary use of weak hooks in the Gulf of Mexico as a conservation strategy for bluefin tuna. This alternative would likely result in short- and long-term neutral economic impacts since it would give fishermen more flexibility in choosing how to fish. In the absence of a weak hook requirement, fishermen could choose whether to use the gear based on their knowledge of bluefin tuna presence and distribution. Weak hooks may have, in some cases, assisted fishermen in reducing use of IBQ allocation because large bluefin were able to free themselves from gear before coming to the boat, and therefore never needed to be counted against a vessel's IBQ allocation. Some fishermen may still find their use beneficial in conserving their IBQ allocation, and would still have the option to deploy weak hooks under this alternative. For example, pelagic longline fishermen that plan to fish in areas with high rates of bluefin tuna interactions may wish to deploy weak hooks to reduce interactions and conserve their IBQ allocation. There could be some risk that not requiring weak hooks from January through June could result in an increased risk for high bluefin tuna interactions for pelagic longline vessels that fish during those months but decide not to use weak hooks, and therefore, those vessels could face a higher risk in depleting their IBQ quota for the year. Under Alternative D3, NMFS would encourage the voluntary use of weak hooks and leave the decision up to individual fishermen based on their experience and on-the-water knowledge. Any potentially risky fishing practices leading to elevated interactions with Gulf of Mexico bluefin tuna would still be dis-incentivized under the IBQ Program. There may be potential economic benefits for recreational fishermen that fish for white marlin or roundscale spearfish as a result of the anticipated decrease in commercial bycatch rates and associated fishing mortality and potential improvements to stock health and status. Removing the weak hook requirement entirely does not align as closely as other alternatives with the objective to continue to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna especially if fishermen do not elect to use weak hooks during spawning season when the risk of encountering spawning bluefin tuna is higher. Although the current IBQ Program likely provides adequate protection for the bluefin tuna stock in the Gulf of Mexico by limiting fishing mortality in the absence of weak hooks (as described in Chapter 1 and in the Three-Year Review of the IBQ Program), the required use of weak hooks may help fishermen manage their IBQ allocation by reducing each fisherman's catch of bluefin tuna. The IBQ Program likely provides sufficient biological protection but weak hooks may provide socioeconomic benefits for fishermen by extending their IBQ allocation, allowing them to fish for a longer period each year. Additionally, during scoping NMFS received more support for retaining a seasonal weak hook requirement (Alternative D2) than removing weak hooks (this alternative) from multiple constituent groups including recreational fishermen, environmental non-government organizations, and commercial (pelagic longline and directed categories) fishermen. Overall, Alternative D2 is considered as the alternative that would achieve a better balance between ecological needs of the resource and socioeconomic needs of the fishery over Alternative D3. Therefore, Alternative D3 is not preferred at this time.

8 Community Profiles

8.1 Introduction

The Magnuson-Stevens Act requires, among other things, that all FMPs include a fishery impact statement intended to assess, specify, and describe the likely effects of the measures on fishermen and fishing communities (§303(a)(9)).

NEPA requires federal agencies to consider the interactions of natural and human environments by using a "systematic, interdisciplinary approach which will 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. The consequences of management actions need to be examined to better ascertain and, to the fullest extent possible, mitigate regulatory impacts on affected constituents.

Social impacts are generally the consequences to human populations resulting from some type of public or private action. Those consequences may include alterations to the ways in which 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 impact analyses help determine the consequences of policy action in advance by comparing the status quo with the projected impacts. Community profiles are an initial step in the social impact assessment process. Although public hearings and scoping meetings provide input from those concerned with a particular action, they do not constitute a full overview of the fishery.

The Magnuson-Stevens Act outlines a set of National Standards that apply to all fishery management plans and the implementation of regulations. Specifically, National Standard 8 notes that:

> "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to: (1) provide for the sustained participation of such communities; and (2) to the extent practicable, minimize adverse economic impacts on such communities" (§301(a)(8)). See also 50 CFR §600.345 for National Standard 8 Guidelines.

"Sustained participation" is defined to mean continued access to the fishery within the constraints of the condition of the resource (50 CFR §600.345(b)(4)). It should be clearly noted that National Standard 8 "does not constitute a basis for allocation of resources to a specific fishing community nor for providing preferential treatment based on residence in a fishing community" (50 CFR §600.345(b)(2). The Magnuson-Stevens Act further defines a "fishing community" as:

> "a community that is substantially dependent upon or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing

vessel owners, operators, crew, and fish processors that are based in such communities" (§301(16)).

Likewise, specific to development and amendment of HMS FMPs, the Magnuson-Stevens Act, paragraph 304(g)(1)(C), requires the Secretary to:

- Evaluate the likely effects, if any, of conservation and management measures on participants in the affected fisheries.
- Minimize, to the extent practicable, any disadvantage to U.S. fishermen in relation to foreign competitors.

NMFS (2001) guidelines for social impact assessments specify that the following elements are utilized in the development of FMPs and FMP amendments:

1. The size and demographic characteristics of the fishery-related work force residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.

2. The cultural issues of attitudes, beliefs, and values of fishermen, fishery-related workers, other stakeholders, and their communities.

3. The effects of final actions on social structure and organization; that is, on the ability to provide necessary social support and services to families and communities.

4. The non-economic social aspects of the final action or policy; these include life-style issues, health and safety issues, and the non-consumptive and recreational use of living marine resources and their habitats.

5. The historical dependence on and participation in the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution and rights.

8.2 Method—Previous Community Profiles and Assessments

Background information on the legal requirements and summary information on the community studies conducted to choose the communities profiled in this document is not repeated here and can be found in previous HMS SAFE Reports, and was most recently updated in Chapter 6 of the 2011 HMS SAFE Report (NMFS 2011). Additionally, the 2011 and 2012 HMS SAFE Reports contain modified demographic profile tables from previous documents to include the same baseline information for each community profiled, and use 1990, 2000, and 2010 Bureau of the Census data for comparative purposes. Chapter 6 of the 2011 SAFE Report is an update of the 2008 SAFE Report (NMFS 2008), and included available 2010 U.S. Census information. The 2008 SAFE Report consolidated all of the communities profiled in previous HMS FMPs or FMP amendments and updated the community information where possible. Of the communities profiled, ten (Wanchese, Beaufort, and Hatteras, North Carolina; Dulac and Houma, Louisiana; Fort Pierce and Bay County, Florida; Barnegat Light, New Jersey; Fairhaven, Massachusetts; and Wadmalaw, South Carolina) were originally selected due to the proportion of pelagic longline landings in the community (Table 8.1), the relationship between the geographic communities and the fishing fleets, the existence of other community studies, and input from the HMS and Billfish Advisory Panels (since consolidated in 2006 into one HMS Advisory Panel). The descriptive community profiles are organized by state

and include information provided by Wilson, *et al.* (1998), Kirkley (2005), Impact Assessment, Inc. (2004), and recent information obtained from MRAG Americas, Inc. (2008).

This section presents social indicators of vulnerability and resilience developed by Jepson and Colburn (2013) for 10 communities selected for being among the top three ports for pelagic longline fishery commercial landings, (Table 8.1). Jepson and Colburn (2013) developed a series of indices using social indicator variables that could assess a coastal community's vulnerability or resilience to potential economic disruptions such as those resulting from drastic changes in fisheries quotas and seasons, or natural and anthropogenic disasters. Indices and index scores were developed using factor analyses of data from the United States Census, permit sales, landings reports, and recreational fishing effort estimates from the Marine Recreational Information Program (MRIP) survey (Jepson and Colburn, 2013). The nine social indices developed by Jepson and Colburn (2013) can be divided into two categories: 1) fishing engagement and reliance, and 2) social vulnerability. For each index, the community is ranked as scoring high (one standard deviation or more above the mean score), medium high (0.5 to 0.99 standard deviations above the mean score), medium (0 to 0.49 standard deviations above the mean score), or low (below the mean score) on the index scale.

Fishing Reliance and Engagement Indices

Jepson and Colburn (2013) developed two indices each to measure community reliance and engagement with commercial and recreational fishing, respectively. Commercial fishing engagement was assessed based on pounds of landings, value of landings, number of commercial fishing permits sold, and number of dealers with landings. Commercial fishing reliance was assessed based on value of landings per capita; number of commercial permits per capita; dealers with landings per capita; and data on percentage of people employed in agriculture, forestry, and fishing from the Bureau of Labor Statistics. The recreational fishing engagement index was measured using MRIP estimates of the number of charter, private boat, and shore recreational fishing trips originating in each community. The recreational fishing reliance index was generated using the same fishing trip estimates adjusted to a per capita basis. MRIP data is not available for the state of Texas, so the recreational indexes for Texas were instead calculated based on recreational permit data from NMFS, and boat ramp data from the state of Texas. As such, recreational index scores for Texas communities are only comparable to other communities within the state.

In Table 8.1, fishing reliance and engagement index scores are presented for 10 HMS communities. Seven of the ten HMS communities scored either high or medium high on commercial or recreational engagement, three of ten scored either high or medium high on commercial reliance, and six of ten scored either high or medium high on recreational reliance, and only one community (Bay County, FL) did not have any scores as there is no data at the county level in the Jepson and Colburn (2013) report. Two communities that scored high on all four indices included Dulac, LA and Barnegat Light, NJ, indicating that these communities have greater than normal dependence on the recreational and commercial fishing sectors for jobs and economic support. Wanchese, Beaufort, and Hatteras, NC, Fort Pierce, FL, and Fairhaven, MA scored high or medium high on both fishing engagement indices, while scoring medium high, medium or low on both fishing reliance indices indicating that while Wanchese, Beaufort, and Hatteras, NC, Fort Pierce, FL, and Fairhaven, MA have a significant fishing community, it is not a massive component of the city's overall population. Conversely, Wadmalaw Island, SC scored high on recreational reliance index, while scoring low on both commercial fishing indices suggesting this community has greater than normal dependence on the recreational fishing sector for jobs and economic support.

Social Vulnerability Indices

Five indices of social vulnerability developed by Jepson and Colburn (2013) are presented in this section (Table 8.1). The personal disruption index includes the following community variables representing disruptive forces in family lives: percent unemployment, crime index, percent with no diploma, percent in poverty, and percent separated females. The population composition index shows the presence of populations who are traditionally considered more vulnerable due to circumstances associated with low incomes and fewer resources. The poverty index includes several variables measuring poverty levels within different community social groups including: percent receiving government assistance, percent of families below the poverty line, percent over age of 65 in poverty, and percent under age of 18 in poverty. The labor force index characterizes the strength and stability of the labor force and employment opportunities that may exist. A higher ranking indicates fewer employment opportunities and a more vulnerable labor force. Finally, the housing characteristics index is a measure of infrastructure vulnerability and includes factors that indicate housing that made be vulnerable to coastal hazards such as severe storms or coastal flooding. Fort Pierce, FL was the only HMS community to score high or medium high on all five indices of social vulnerability with Dulac, LA scored high on four of the five indices of social vulnerability. Four other HMS community scored high or medium high on two or three social vulnerability indices: Wanchese, NC; Beaufort, NC; Wadmalaw Island, SC; and Hatteras, NC while Houma, LA scored medium or medium high on all five indices of social vulnerability. These scores suggest these communities would likely experience greater difficulty recovering from economic hardships caused by job losses in the recreational and commercial fishing sectors.

Table 8.1 Social Vulnerability Indices for 10 HMS Communities for 2015–2017

Community	Population	Fishing Engagement and Reliance				Social Vulnerability				
		Commercial Engagement	Commercial Reliance	Recreational Engagement	Recreational Reliance	Personal Disruption	Population Composition	Poverty	Labor Force	Housing
Wanchese, NC	1,753	HIGH	MED HIGH	MED HIGH	HIGH	LOW	LOW	MED HIGH	LOW	MED HIGH
Dulac, LA†	1,463*	HIGH	HIGH	HIGH	HIGH	HIGH	MEDIUM	HIGH	HIGH	HIGH
Houma, LA†	33,727*	HIGH	LOW	LOW	LOW	MED HIGH	MEDIUM	MEDIUM	MEDIUM	MED HIGH
Fort Pierce, FL	42,744	MED HIGH	LOW	HIGH	MEDIUM	HIGH	HIGH	HIGH	MED HIGH	MED HIGH
Barnegat Light, NJ	592	HIGH	HIGH	HIGH	HIGH	LOW	LOW	LOW	HIGH	LOW
Fairhaven, MA	15,873*	HIGH	LOW	MED HIGH	LOW	LOW	LOW	LOW	LOW	MEDIUM
Bay County, FL‡	168,852*									
Beaufort, NC	4,119	HIGH	MEDIUM	HIGH	MED HIGH	MED HIGH	LOW	LOW	LOW	MED HIGH
Wadmalaw Island, SC	2,725*	LOW	LOW	LOW	HIGH	LOW	LOW	LOW	HIGH	MED HIGH
Hatteras, NC†	504*	MEDIUM	MEDIUM	HIGH	HIGH	MED HIGH	LOW	MED HIGH	MEDIUM	MED HIGH

* Population estimates (2010 census) from https://factfinder.census.gov.
† https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/map.
‡Jepson and Colburn (2013) and https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/map web page do not provide social vulnerability index analyses on a county level.
Source: Jepson and Colburn 2013 and https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/index.

8.3 References

Impact Assessment, Inc. 2004. Identifying Communities Associated with the Fishing Industry in Louisiana. La Jolla, California. (NOAA-NMFS-Contract WC133F-02-SE-0297).

Jepson, Michael and Lisa L. Colburn 2013. Development of Social Indicators of Fishing Community Vulnerability and Resilience in the U.S. Southeast and Northeast Regions. U.S. Dept. of Commerce., NOAA Technical Memorandum NMFS-F/SPO-129, 64 p.

Kirkley, J.E. 2005. The communities of the Atlantic Highly Migratory Species (HMS) Fishery: An overview of change associated with the HMS Fishery Management Plan. Department of Coastal and Ocean Policy, School of Marine Science, Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, Virginia (NOAA-NMFS-HMS contract report).

MRAG, Americas, Inc., and M. Jepson. 2008. Updated Profiles for HMS Dependent Fishing Communities: Social Impact Assessment Services for HMS Fishing Communities. Solicitation Number: DG133F06RQ0381, 84 pp.

NMFS. 2001. NMFS Operational Guidelines – Fishery Management Process: Appendix 2(g): Guidelines for Assessment of the Social Impact of Fishery Management Actions. Silver Spring, MD: U.S. Department of Commerce, National Marine Fisheries Service.

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NMFS. 2011. Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species, 2011. Silver Spring MD: U.S. Department of Commerce, National Marine Fisheries Service. 294 pp.

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U.S. Census Bureau; American Community Survey, 2010 American Community Survey 1-Year Estimates, Table 8.1; generated by Nicolas Alvarado; using American FactFinder; <http://factfinder.census.gov>; (13 March 2019).

Wilson, D., B.J. McCay, D. Estler, M. Perez-Lugo, J. LaMargue, S. Seminski, and A. Tomczuk. 1998. Social and Cultural Impact Assessment of the Highly Migratory Species Fishery Management Plan and the Amendment to the Atlantic Billfish Fisheries Management Plan. The Ecopolicy Center for Agriculture, Environmental, and Resource Issues, New Jersey Agricultural Experiment Station, Cook College, Rutgers, the State University of New Jersey (NOAA-NMFS-HMS contract report).

9 Applicable Laws

9.1 Magnuson-Stevens Fishery Conservation and Management Act

Fishery management measures must be consistent with ten national standards contained in the Magnuson-Stevens Act (sec. 301). This section describes how the preferred alternatives in this action are consistent with the National Standards (NS) and guidelines set forth in 50 CFR part 600. More information on the Magnuson-Stevens Act can be found in earlier chapters.

9.1.1 Consistency with the National Standards

NS 1 requires NMFS to prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery.

The preferred alternatives in this action meet the requirements of NS 1 by adopting and implementing conservation and management measures that help achieve, on a continuing basis, the optimum yield for directed HMS pelagic longline fisheries, while continuing to effectively manage and prevent overfishing of Atlantic bluefin tuna and other species. Objectives include: continue to minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS consistent with conservation and management objectives; simplify and streamline Atlantic HMS management by reducing redundancies in regulations; and optimize the ability of the pelagic longline fishery to harvest target species quotas. Preferred alternatives would result in management actions consistent with the fishery conservation and management requirements of NS1 of the Magnuson-Stevens Act and the requirements of the ATCA.

The preferred alternatives would help to achieve optimum yield for target species, such as swordfish and yellowfin tuna, by increasing fishing opportunities to catch science-based quotas where established and flexibility regarding the locations in which pelagic longline effort is directed.

For quota-managed stocks, including western Atlantic bluefin tuna and North Atlantic swordfish, the actions considered and analyzed in this FEIS would not affect or alter science-based quotas for the stocks, which were previously established consistent with relevant legal requirements, including NS1. Only the time and place (i.e., for gear restricted area/closed area alternatives) and/or manner (i.e., gear/weak hooks) in which quotas are caught could be affected. Preferred alternatives are also intended to be consistent with conservation and management requirements for other species, including bycatch species, in the pelagic longline fishery.

Preferred alternatives would remove (or evaluate the removal of) some existing area-based restrictions on pelagic longline fishing that were originally implemented to help limit bluefin bycatch. Preferred alternatives balance of all three rulemaking objectives. The alternatives are designed to ensure that (or evaluate whether) removing such restrictions would not affect the pelagic longline fishery's ability to appropriately limit incidental catch of bluefin tuna, within the Longline category quota. Other previously-implemented management measures, such as

NMFS's ability to transfer quota inseason from one category to another, further help ensure that, overall, the bluefin tuna fishery remains within its quota.

The preferred alternatives would also modify regulations requiring weak hook use in the Gulf of Mexico. Existing regulations require pelagic longline vessels to use weak hooks in the Gulf of Mexico year-round, but the preferred alternative would change this to required use from January through June. This includes bluefin tuna spawning season, which is from April to June in the Gulf of Mexico. Modifying the weak hook requirement in this way would increase opportunities for longline vessels to catch target species while leaving in place the requirement to use weak hooks when spawning bluefin are present in the greatest abundance and when they are spawning. Removing the requirement to use weak hooks from July through December is not anticipated to lead to overfishing to occur given the low abundance of bluefin tuna in the Gulf of Mexico at that time and the fact that any catch would be within previously-established, science-based quotas.

NS 2 requires that conservation and management measures be based on the best scientific information available.

The preferred alternatives in this document are consistent with NS 2. The preferred alternatives are based on the best scientific information available, including the latest stock assessments, scientific research, and up-to-date data sources. The data sources cited throughout the FIES represent the best scientific information available.

NS 3 requires that, to the extent practicable, an individual stock of fish be managed as a unit throughout its range and interrelated stocks of fish be managed as a unit or in close coordination.

The preferred alternatives in this document are consistent with NS 3. Chapter 3 of the 2006 Consolidated HMS FMP describes the management units implemented by the FMP. This action would not alter the established management unit for Atlantic HMS, which are managed as a unit throughout their range in U.S. federal waters (and state waters as a permit condition unless the states have more restrictive regulations). Given the highly migratory nature of the stocks, international efforts are critical to their conservation and management throughout their entire range. Thus, measures are adopted and implemented for many of these stocks through the ICCAT, and those measures are implemented domestically. Conservation and management measures in the 2006 Consolidated HMS FMP and amendments address both domestic and international requirements for the stocks.

NS 4 requires that conservation and management measures do not discriminate between residents of different states. Furthermore, if it becomes necessary to allocate or assign fishing privileges among various U.S. fishermen, such allocation should be fair and equitable to all fishermen; be reasonably calculated to promote conservation; and should be carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The preferred alternatives in this document are consistent with NS 4. This rulemaking addresses

geographically-based management measures, such as closed areas and geographically-discrete gear restrictions or requirements. Thus, the preferred alternatives necessarily are limited in their application geographically. The preferred alternatives would relieve restrictions applicable to certain geographic areas and thus present some additional options for some fishermen whose access may have been more limited under existing regulations. None of the alternatives discriminates between residents of different states. Furthermore, the HMS pelagic longline fishery is highly mobile, and participants often travel long distances for fishing opportunities. The preferred measures do not discriminate between residents of different states since pelagic longline fishermen of all states will have access to areas affected by this action. The preferred alternatives do not allocate or assign fishing privileges.

NS 5 requires that conservation and management measures should, where practicable, consider efficiency in the utilization of fishery resources with the exception that no such measure shall have economic allocation as its sole purpose.

The preferred alternatives in this document are consistent with NS 5. The preferred alternatives, where practicable, consider efficiency in the utilization of fishery resources. No such measures have economic allocation as their sole purpose. Some of the preferred alternatives are anticipated to increase efficiency in the utilization of fishery resources. For example, instead of considering outright removal of the spatially managed areas, NMFS has selected preferred Northeastern United States Closed Area and Spring Gulf of Mexico Gear Restricted Area alternatives (Alternatives A4 and C3) that would undertake a review process to collect data and evaluate the continued need for the Northeastern United States Closed Area and Spring Gulf of Mexico Gear Restricted Area. This review process allows access under controlled conditions, which may increase operational efficiency of the fishery in harvesting target quotas by providing more fishing opportunity or flexibility in selection of fishing location while the area is under evaluation. Preferred Alternative B2 would remove the current gear restricted area off North Carolina, which could provide more opportunity and flexibility for vessels that recently did not meet access criteria to the area. Increased efficiency is also expected since areas within the gear restricted area have higher catch-per-unit effort than areas outside of the gear restricted area (e.g., see Figure 4.11). Preferred Alternative D2 would require use of weak hooks in the Gulf of Mexico on a seasonal basis, instead of the current year-round requirement. Fishermen would have the option to choose the best type of circle hook (weak hook or standard) to complement fishing practices in the second half of the year, which is anticipated to increase efficiency. Retaining the weak hook requirement in the first half of the gear might reduce efficiency in harvesting extremely heavy yellowfin and swordfish, however the additional protection offered to spawning bluefin in the Gulf of Mexico warrant this action.

NS 6 states that conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches. The preferred alternatives in this document are consistent with NS 6.

The preferred alternatives in this action were designed to take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches. Alternative analyses are based on consideration of multiple years of data to ensure that decisions are not based on a single, possibly aberrant year of data. Furthermore, the analyses compare data from

baseline periods (i.e., prior to implementation of respective measures) against data recently collected to demonstrate temporal variations in the data. Each of the preferred alternatives were designed to give HMS pelagic longline fishermen more flexibility when fishing, allowing for adjustments in fishing techniques and location to better adapt to changing fishing conditions. Allowing increased access in areas that currently restrict pelagic longline fishing (Alternatives A4, B2, and C3) would give fishermen more flexibility to focus effort in areas that increase target catch and decrease incidental catch. Alternative D2 would allow pelagic longline fishermen in the Gulf of Mexico to decide whether to use weak hooks during half the year. Providing this flexibility would give fishermen the ability to better adjust to variations among, and contingencies in, fisheries, fishery resources, and catches.

NS 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

The preferred alternatives in this document are consistent with NS 7. The economic impacts section of the FEIS provides detailed analyses of the costs and cost savings associated with each alternative. The preferred alternatives were chosen, in part, to minimize costs while meeting required conservation and management objectives. The preferred alternatives were also structured to avoid unnecessary duplication by taking into account the range of alternatives as well as existing requirements on the relevant fisheries and existing measures in place for the pelagic longline fishery. Existing regulations appear to be unnecessary in tandem to appropriately limit incidental catch of bluefin tuna in the pelagic longline fishery. The preferred alternatives would streamline regulatory requirements and remove regulatory burden (or provide a mechanism to further evaluate whether to remove regulatory burden). This is consistent with NS 7 guidelines, which specify that management measures should not impose unnecessary burdens on the economy or individuals and that management measures should be designed to give fishermen the greatest possible freedom of action in conducting business and pursuing recreational opportunities that are consistent with ensuring wise use of the resources and reducing conflict in the fishery.

NS 8 states that conservation and management measures shall, consistent with the conservation requirements of the Magnuson-Stevens Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to provide for the sustained participation of such communities, and to the extent practicable, minimize adverse economic impacts on such communities.

The preferred alternatives in this document are consistent with NS 8. The preferred alternatives would modify HMS pelagic longline regulations in a manner that increases fishermen's access to target species while minimizing impacts to bluefin tuna and other incidentally-caught species. Because the preferred alternatives increase access and flexibility for fishermen, and reduce redundant regulations, beneficial social and economic impacts are likely.

NS 9 states that conservation and management measures shall, to the extent practicable, minimize bycatch, and to the extent that bycatch cannot be avoided, minimize the mortality of such bycatch.

The preferred alternatives in this document are consistent with NS 9, minimizing bycatch to the extent practicable and, to the extent that bycatch cannot be avoided, minimizing the mortality of such bycatch. In the case of bluefin tuna, existing management measures (e.g. the IBQ Program) control fishing activity and incentivize pelagic longline fishery participants to minimize bycatch and bycatch mortality, rendering some gear restricted areas, Closed Areas, and the weak hook requirement potentially unnecessary and redundant. If fishermen interact with more bluefin tuna than can be covered with their IBQ allocation, then they cannot fish after certain time intervals (and thereby incur additional bluefin tuna mortality) until all bluefin tuna mortality has been accounted for in the IBQ Program. Therefore, the individual accountability aspects of the IBQ Program would still be relied upon to incentivize bluefin tuna avoidance, meaning that there would be an appropriate means to achieve the objectives of continuing to minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS. NMFS also considered minimizing bycatch of other species in selecting its preferred alternatives, are reflected in Chapters 3 and 4.

Furthermore, the preferred alternatives for the Spring Gulf of Mexico Gear Restricted Area and the Northeastern United States Closed Area include a provision to adjust the threshold incorporated into the evaluation option in the event that the U.S. allocation of bluefin quota is adjusted at a future ICCAT meeting. The threshold described in the FEIS for the Spring Gulf of Mexico Monitoring Area that if the ICCAT quota and U.S. allocation are reduced, the threshold amount would also be reduced to a level commensurate with the current level. The current selected amount is equivalent to 55 percent of new total Gulf of Mexico IBQ annual allocation that results if ICCAT adopts a lower TAC for western Atlantic bluefin tuna. If the ICCAT quota is adjusted upwards, however, the IBQ allocation amount for the threshold will not be adjusted upwards. Similarly, the threshold described in the FEIS for the Northeastern United States Monitoring Area that if the ICCAT quota and U.S. allocation are reduced, the threshold amount would also be reduced to a level commensurate with the current level. The current amount is equivalent to 72 percent of the Atlantic category IBQ annual allocation disbursed to the fleet each year. The reduction would ensure that the threshold remains at 72 percent of new total Atlantic IBQ annual allocation that results if ICCAT adopts a lower TAC for western Atlantic bluefin tuna. If the ICCAT quota is adjusted upwards, however, the IBQ allocation amount will not be adjusted upwards. This is a change between the DEIS and the FEIS, and provides a conservative approach that ensures the threshold will not increase over the level established by the action and would decrease commensurate with any potential quota decrease should one occur. In the event that the ICCAT allocations to the United States are adjusted upward, the threshold would remain the same.

NS 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

The preferred alternatives in the document are consistent with NS 10. No impact to safety of life at sea is anticipated to result from these preferred alternatives. The preferred alternatives would

not require fishermen to travel greater distances, fish in bad weather, or otherwise fish in an unsafe manner. Rather, the preferred alternatives could reduce potential risks by providing greater flexibility and more fishing options.

9.2 Paperwork Reduction Act

There are no new collection of information requirements in the action pursuant to the Paperwork Reduction Act.

9.3 Coastal Zone Management Act

NMFS has determined that this action is consistent to the maximum extent practicable with the enforceable policies of the approved coastal management program of each state along the Atlantic coast, Gulf of Mexico, and the Caribbean Sea. This determination was submitted for review by the responsible state agencies under section 307 of the CZMA. During the review no states determined this action was inconsistent with the enforceable policies of the approved coastal management program of each state.

9.4 Environmental Justice

Executive Order 12898 requires agencies to identify and address disproportionately high and adverse environmental effects of its regulations on minority and low-income populations. To determine whether environmental justice concerns exist, the demographics of the affected area should be examined to ascertain whether minority populations and low-income populations are present. If so, a determination must be made as to whether implementation of the alternatives may cause disproportionately high and adverse human health or environmental effects on these populations.

Community profile information are available in the 2006 Consolidated HMS FMP (Chapter 9), a recent report by MRAG Americas, and Jepson (2008) titled "Updated Profiles for HMS Dependent Fishing Communities" (Appendix E of Amendment 2 to the 2006 Consolidated HMS FMP), and in the 2015 HMS SAFE Report. The MRAG report updated community profiles presented in the 2006 Consolidated HMS FMP, and provided new social impacts assessments for HMS fishing communities along the Atlantic and Gulf of Mexico coasts. The 2011 and 2012 SAFE Reports (NMFS 2011 and NMFS 2012) include updated census data for all coastal Atlantic states, and some selected communities that are known centers of HMS fishing, processing or dealer activity. Demographic data indicate that coastal counties with fishing communities are variable in terms of social indicators like income, employment, and race and ethnic composition.

The preferred alternatives were selected to minimize ecological and economic impacts and provide for the sustained participation of fishing communities. The preferred alternatives would not have any effects on human health nor are they expected to have any disproportionate social or economic effects on minority and low-income communities.

9.5 References

MRAG, Americas, Inc., and M. Jepson. 2008. Updated Profiles for HMS Dependent Fishing Communities: Social Impact Assessment Services for HMS Fishing Communities. Solicitation Number: DG133F06RQ0381, 84 pp.

NMFS. 2006. Final Consolidated Atlantic Highly Migratory Species Fishery Management Plan. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Office of Sustainable Fisheries, Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD. Public Document. pp. 1600.

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10 List of Preparers

The development of this rulemaking involved input from many people within NMFS, NMFS contractors, and input from the public, constituent groups, and the HMS Advisory Panel. Staff and contractors from the HMS Management Division, in alphabetical order, who worked on this document include:

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- Megan Mackey, Fishery Management Specialist
- Rick Pearson, Fishery Management Specialist
- George Silva, Fishery Economist
- Carrie Soltanoff, Fishery Management Specialist
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10.1 List of Agencies, Organizations, and Persons Consulted

Under 304(g)(1)(A) of the Magnuson-Stevens Act, NMFS is required to consult and consider the comments and views of affected Fishery Management Councils, ICCAT Commissioners and advisory groups, and advisory panels established under 302(g) regarding amendments to an Atlantic HMS FMP. NMFS provided documents for the Atlantic, Gulf, and Caribbean Fishery Management Councils, Gulf and Atlantic States Marine Fisheries Commissions, and the HMS Advisory Panel at various stages throughout the process. Specifically, the HMS AP was consulted during scoping, DEIS, and proposed rule stages of this action. Hard copies will be provided to anyone who requests copies.

The development of this document also involved considerable input from other staff members and Offices throughout NOAA including, but not limited to:

- Other Divisions within the Office of Sustainable Fisheries;
- NMFS Southeast Fisheries Science Center;

- NOAA Office of General Counsel (Megan Walline, Loren Remsberg);
- NOAA Office of Law Enforcement; and
- NMFS NEPA.

On March 2, 2018 (83 FR 8969), NMFS published a scoping document for this rulemaking that evaluated management options for three spatially managed areas and gear-based regulations, all of which were implemented with the objective of reducing bluefin tuna dead discards or interactions. NMFS received approximately 275 unique comments during the public scoping period (March 2, 2018 through May 1, 2018). Comments included three letter writing campaign batch submissions that totaled 13,444 form letters.

NMFS published a DEIS (May 17, 2019; 84 FR 22492) and a proposed rule (July 12, 2019; 84 FR 38918) to evaluate fourteen alternatives for future management measures concerning the same three spatially managed areas and gear based regulations NMFS accepted public comments on the DEIS and proposed rule through September 30, 2019. Two HMS Advisory Panel meetings were held during the open comment period for the DEIS, and one HMS Advisory Panel meeting was held during the open comment period for the proposed rule. In addition, NMFS hosted five public hearings along the Atlantic Coast and the Gulf of Mexico (two in Gloucester, MA; and one each in Houma, LA, Toms River, NJ, and Manteo, NC). NMFS also hosted two conference calls/webinars. Additionally, we provided copies of the DEIS to the EPA Regional Offices.

Approximately 11,460 comments, many of which were form letter campaign submissions, were submitted to www.regulations.gov including comments from the Environmental Protection Agency, the Department of the Interior, and the state of Florida. All comments were considered when finalizing this document. Copies of this final document will be sent to the EPA regional offices, the HMS consulting parties (the affected Regional Fishery Management Councils, ICCAT Commissioners and the ICCAT Advisory Committee, and the HMS Advisory Panel), the Atlantic and Gulf States Marine Fisheries Commissions, and other interested parties. This FEIS will be made available to the public via the HMS webpage. Once the final rule is published in the Federal Register, it will also be made available to the public online.

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Appendices

11.1 Appendix A: Summary of Comments from Scoping

NMFS published a notice of availability for a scoping document on March 2, 2018 (83 FR 8969). The comment period for the scoping phase of this action was open for 60 days, during which six scoping meetings were held. The comment period closed on May 1, 2018. During the comment period, NMFS received substantial public comment and feedback on the management options in the scoping document. The following is a brief comment summary by subject matter received during the scoping process (comments available on the Federal e-Rulemaking Portal (search for "NOAA-NMFS-2018-0035"). Comments that are similar in nature are combined into one bullet.

Northeastern United States Pelagic Longline Closure

- NMFS should expand the closure to the north and east to encompass the shift of bluefin tuna and bluefin tuna interaction to the northeast.
- NMFS should trim the western boundary of the area to open areas with no bluefin tuna interactions.
- NMFS should consider a seaward expansion of the Closed Area.
- NMFS should consider a temporal expansion to include both June and July.
- NMFS should remove the area completely. Opening the Closed Areas will help spread the fleet out and give more flexibility to avoid bluefin tuna and protected resources.
- NMFS should initiate experimental data collection in the area before it can be opened to the whole fleet.
    - NMFS should either conduct this research themselves or issue an EFP in conjunction with NOAA Scientists to evaluate potential impacts of spatio-temporal changes to the Northeastern United States Closed Area.
- NMFS should not change management measures for this area (i.e., adopt a No Action management option).
- NMFS should pursue the provisional application option, which would allow the Northeastern United States Closed Area to remain open until bluefin tuna bycatch (landings and discards) reaches a level that triggers a closure of the area in June (or by another designated point of time) of a given year.

Cape Hatteras Gear Restricted Area (Gear Restricted Area)

- NMFS should eliminate the GRA because it is redundant with current IBQ program management measures.
- NMFS should pursue the provisional application option, which would allow the Cape Hatteras gear restricted area to remain open until bluefin tuna bycatch (landings and discards) reaches a level that triggers gear restricted area management measures.
- NMFS should not relax regulations in this area, because longliners may be modifying gear to target bluefin tuna in and around the gear restricted area.

- NMFS should expand the gear restricted area north to the entrance of the Chesapeake Bay.
- NMFS should expand the gear restricted area by extending the southward boundary south to the "triple zeros" (Loran line 41.0000), and moving the eastern boundary east by 30 minutes of longitude.

Gulf of Mexico Gear Restricted Areas

- NMFS should ban longline fishing in the Gulf of Mexico.
- NMFS should pursue management strategies that maximize the protection of spawning bluefin tuna in the Gulf of Mexico.
- Options related to the Gulf of Mexico Gear Restricted Areas should not be included in the proposed rule.
- The Gulf of Mexico Gear Restricted Areas have been a great success and NMFS should not change Gulf of Mexico gear restricted area management measures (i.e., a No Action management option):
    - The gear restricted areas are the only tool that completely avoids interactions; the IBQ Program by itself is insufficient to reduce bluefin tuna interactions.
    - The gear restricted area, along with weak hook measures, has reduced bluefin tuna bycatch with no observed negative impacts on yellowfin tuna catches or other significant adverse socioeconomic impacts.
- NMFS should make the Gulf of Mexico gear restricted area management measures more restrictive. NMFS could combine the two areas currently comprising the gear restricted area into a larger box that fully spans all areas with elevated bluefin tuna interactions.
- Relieving restrictions to this area could create incentives to not participate in the Deepwater Horizon Oceanic Fish Restoration Project.
- NMFS should pursue alternative gears rather than incentivizing pelagic longline activity. Use of alternate gear in the gear restricted area offsets any economic impacts of the gear restricted area.
- NMFS should remove the gear restricted area in order to maximize opportunities to harvest yellowfin tuna.
- NMFS should consider management measures that allow pelagic longline fishermen from locations outside of the Gulf of Mexico access to the gear restricted area. For example, NMFS could consider relaxing the regional restrictions in the IBQ program to allow fishermen with Atlantic IBQ to fish in the gear restricted area.
- NMFS should pursue the provisional application option, which would allow the Gulf of Mexico gear restricted area to remain open until bluefin tuna bycatch (landings and discards) reaches a level that triggers gear restricted area management measures.
- NMFS should not implement provisional application because: the administrative burden is high; it is unrealistic to get real-time, accurate reporting; and a disaster set could undermine the entire system.
- NMFS should not consider implementing performance metrics for the Gulf of Mexico gear restricted area. Application of performance metrics does not exclude many vessels, and would likely not produce the same benefits as noted for the Cape Hatteras gear restricted area. Performance metrics in this area may incentivize underreporting.

Weak Hooks

- NMFS should expand weak hook regulations for the pelagic longline fishery.
- NMFS should not change weak hook requirements in the Gulf of Mexico (i.e., a No Action management option).
- NMFS should implement a seasonal (January to June) requirement of weak hooks.
- NMFS should completely remove the weak hook requirement due to redundant regulations and loss of large swordfish. NMFS could encourage the use voluntary use of weak hooks as a conservation strategy for bluefin tuna.
- NMFS should consider designating bluefin tuna hotspots and in those hotspots require the use of weak hooks.

Pelagic Longline Fishery Comments

- NMFS should pursue no action options. The current regulations are a compromise. Keeping this compromise intact avoids a total ban on pelagic longline fishing.
- NMFS should prohibit commercial fishing with pelagic longline gear.
- NMFS should not relax any pelagic longline regulations due to potential impact on bluefin tuna and directed (e.g., handgear) commercial bluefin tuna fisheries.
- NMFS should consider enlarging the size of, and extending the number of months, of pelagic longline spatial management areas
- NMFS should not reopen any areas to pelagic longline gear.
- NMFS should not seek to revitalize the U.S. Atlantic pelagic longline fishery. Instead of seeking to increase landings through the pelagic longline fishery, NMFS should relax the restrictions on non-pelagic longline swordfish fisheries (e.g., allow for more non-pelagic longline swordfish permits).
- NMFS should not rely on the IBQ Program as a sole tool for managing bluefin tuna bycatch on pelagic longline boats in the Gulf of Mexico. This runs the risk of setting up a *de facto* pelagic longline quota for bluefin tuna in this region (contrary to ICCAT requirements for bluefin tuna in the Gulf of Mexico).
- NMFS should facilitate a buyout of longline permits and vessels with those willing to sell. For those not willing to sell, they should transition to buoy gear or green stick gear.
- NMFS should not allow expansion of the pelagic longline fishery.
- NMFS should consider more actions to ensure sustainable fishing and reduce bycatch (observers documenting bycatch, deterrence of illegal pelagic longline fishing, and mandatory use of bird-scaring streamers when deploying baited longlines).
- Reversing Amendment 7 management measures will not reverse the decline of the pelagic longline fleet, which was occurring prior to implementation of Amendment 7.

Other Comments

- NMFS should research 1) catch rates of swordfish on 16# and 18# circle hooks, and explain why 16# circle hooks don't catch swordfish as well as 18#, and 2) whether 16# circle hooks increase interaction rates with loggerhead turtles in the Gulf of Mexico.
- Arguments presented by NMFS which support the modification of regulations in the scoping document are weak, specifically decreased target catch and declining pelagic longline fleet.

11.2 Appendix B: Southeast Fisheries Science Center Gulf of Mexico Bluefin Tuna Pelagic Longline Research—Weak Hooks

Weak hooks are hooks made of a thinner gauge wire that can straighten and release large fish when they are captured. In 2011, NMFS implemented the requirement for all HMS pelagic longline fishermen to use weak hooks when operating in the Gulf of Mexico in order to reduce the catch of bluefin tuna and the rule was implemented rapidly to protect a large year class of bluefin tuna that was approaching maturity and expected to enter the Gulf of Mexico to spawn for the first time (76 FR 18653; April 5, 2011). The requirement was based on research NMFS conducted from 2007 through 2010 on the use of weak hooks by pelagic longline vessels operating in the Gulf of Mexico to reduce bycatch of spawning bluefin tuna. NMFS continued the weak hook research for an additional year in 2012.

This appendix summarizes data from a Southeast Fisheries Science Center (SEFSC) Gulf of Mexico bluefin tuna pelagic longline experiment as recorded by Pelagic Observer Program observers. Control gear configuration included a standard 16/0 Mustad carbon steel circle hook (#39960) with sardine, squid or thread herring as bait. The experimental gear configuration includes a custom 16/0 Mustad circle hook constructed of 15/0 carbon steel material (i.e., a "weak hook", #39988) with the same type of bait. Control and treatment hooks were deployed in alternating fashion on pelagic longline gear (Figure B.1). Hook timers (Lindgrin Pitman, HT600 600m) were deployed on 300 hooks (150 on each type), and temperature/depth recorders (Lotek Wireless Model LAT1400, 1000 m, data point every 1-2 minutes) were deployed on 150 weak hooks, approximately 9m above the hooks. Eight vessels were involved in an experiment observing 418 sets and deploying 245,881 hooks. An additional 51,067 hooks were deployed over 111 sets on 2 vessels in 2012. Fisher's Exact test was used to analyze results. Preliminary results of the research with data through 2010 were presented in an appendix to the Final Environmental Assessment (EA) to Require the Use of Weak Hooks on Pelagic Longline Vessels in the Gulf of Mexico - April 2011. The most recent results of the SEFSC research were presented at the 2012 HMS Advisory Panel meeting (Foster and Bergmann, unpublished data[5]). A copy of the Final EA or the presentation may be requested by contacting Jennifer Cudney at jennifer.cudney@noaa.gov or 727-824-5399.

Updated research results showed that the use of a weak hook reduces the amount of bluefin tuna caught (-46 percent change, statistically significant at $p<0.05$)(Table B.1). A statistically significant 22 percent reduction in the amount of wahoo captured on weak hooks was also noted. Some reductions in the amount of target catch of yellowfin tuna and swordfish were noted but were not statistically significant. However, statistically significant results also indicated that the catch of white marlin and roundscale spearfish increased by nearly 46 percent on weak hooks. Results also indicate that the majority of escapes with weak hooks take place within 5 minutes of becoming hooked (Figure B.2).

Since the weak hook requirement has been in place for approximately 8 years (rule was finalized April 5, 2011), NMFS can compare fishing before and after the requirement using HMS logbook

[5] Foster D, C Bergmann. 2012. 2012 Update Gulf of Mexico Weak Hook Research (Preliminary Results). Presentation to the Atlantic HMS Advisory Panel. September 19-21, 2012

data. In general, actual weak hook effects match results from the 2007-2010 research project. Bluefin tuna catch-per-unit effort and interactions both dropped after the requirement while catch-per-unit effort and interactions for swordfish, yellowfin tuna, and blue marlin remained relatively stable. White marlin/roundscale spearfish catch-per-unit effort and interactions increased with the use of weak hooks (Table B.2). These species were combined for analytical purposes because they can be difficult to tell apart, and because combination of data enabled a more robust sample size for analysis.

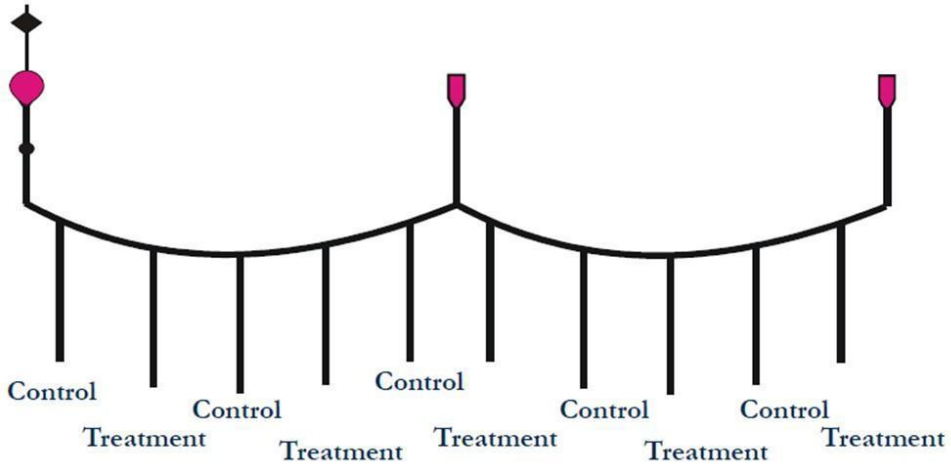

Figure B.1 Experimental Gear Configuration for 2008–2010 Comparison of Standard Circle Hooks and Weak Hooks

Table B.1 Catch Comparisons from Gulf of Mexico Experimental Fishing Data (2008–2012) that Indicate Differences between Gear Rigged with Weak Hooks and Gear Rigged with Conventional Hooks

Target Species	n	Percent Reduction (%)	p-value
Bluefin tuna	134	46	0.0007**
Yellowfin tuna total	3312	3.1	0.3723
Yellowfin tuna kept	2547	6.0	0.1203
Swordfish total	290	-7.1*	0.597
Swordfish kept	69	27.5	0.2283
Dolphinfish	918	9.9	0.1201
Wahoo	375	22.3	0.0173**
Restricted species—billfish			
Blue marlin	157	1.3	1
Atlantic sailfish	62	22.9	0.3741
White marlin/roundscale spearfish	172	-45.7*	0.0178**
Managed sharks			
Large coastal sharks	108	16.9	0.3865
Pelagic sharks	33	5.9	1

*Negative value denotes an increase.
**Statistically significant at $\alpha < 0.05$ level.
Source: D. Foster, Southeast Fisheries Science Center, unpublished data.

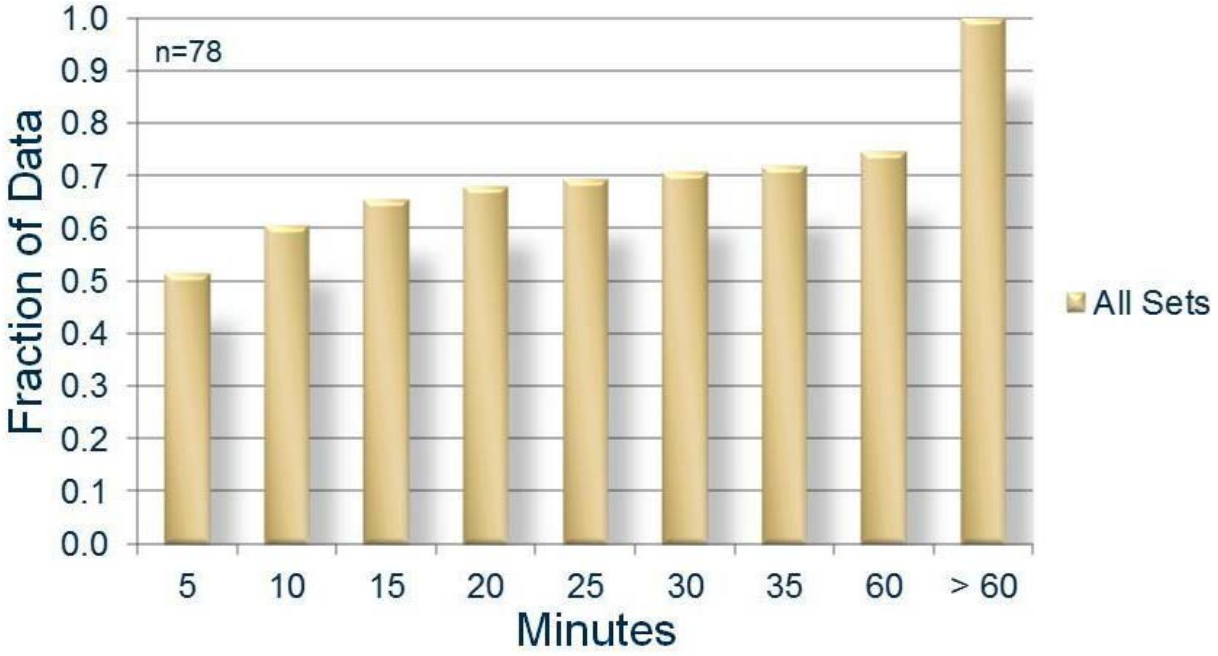

Figure B.2 Quartile Plot Showing Time of Release Data for Straightened Hooks with Temperature/Depth Recorders

Data Source: D. Foster, Southeast Fisheries Science Center, unpublished data.

Table B.2 Pelagic Longline CPUE (interactions/number of hooks x 1000) and Interactions with HMS Before (2008–2010) and After (2011–2018) Implementation of the Gulf of Mexico Weak Hook Requirement

Species	2008–2010 Average Annual CPUE	2011–2018 Average Annual CPUE	2008–2010 Average Annual Interactions	2011–2018 Average Annual Interactions
Bluefin tuna (on trips targeting any species)	0.152	0.062	301	111
Swordfish (on trips targeting swordfish)	5.664	5.608	20,376	50,919
Yellowfin tuna (on trips targeting yellowfin tuna)	7.159	9.440	12,987	13,711
Blue marlin (on trips targeting any species)	0.109	0.174	272	282
White marlin (on trips targeting any species)	0.112	0.229	298	362

Source: HMS logbook data.

11.3 Appendix C: Additional Maps of Pelagic Longline Fishery Data

NMFS received numerous requests for pelagic longline catch and effort data expressed in a different format known as bivariate hexbin map charts. Although NMFS was unable to fully address these requests at the proposed rule stage given resource limitations, several maps were provided as part of the presentation provided to the HMS Advisory Panel in Spring 2019 and at public hearings that show fishery interactions of bluefin tuna or landings of target species, and effort (number of sets) (Figure C.1 - Figure C.3). Subsequently, NMFS produced additional shot charts that more directly addressed the requests and show interaction rates (catch per 10,000 hooks) and effort (number of sets) (Figure C.4 - C.11). These charts do not represent new analyses nor new information but are only a different format and expression of data used at the DEIS/Proposed Rule stage.

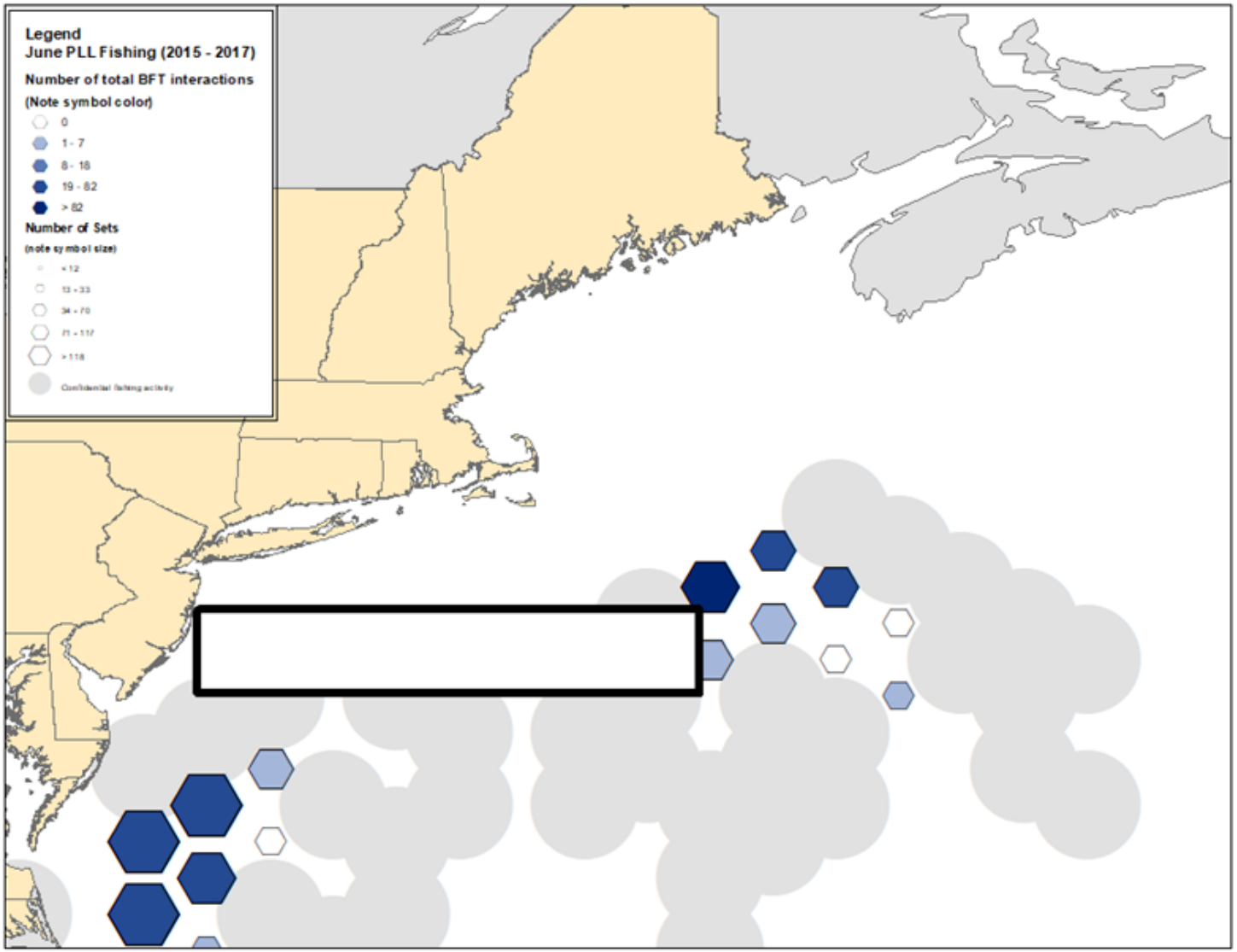

Figure C.1. Shot chart showing bluefin tuna interactions and effort for June 2015-2017.
Darker color = more bluefin.
Larger size of hexagon = more sets

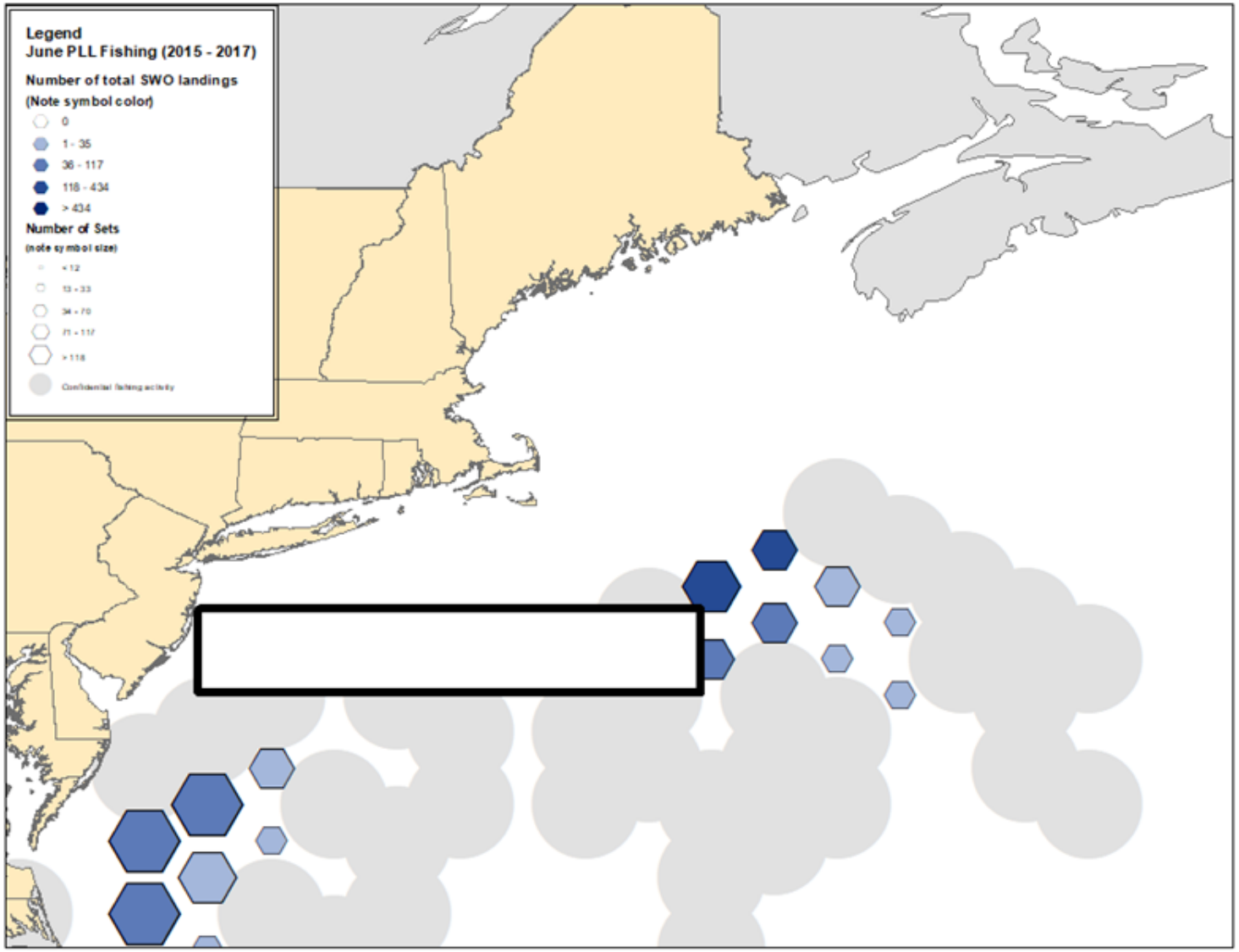

Figure C.2. Shot chart showing swordfish (SWO) landings and effort for June 2015-2017.
Darker color = more swordfish.
Larger size of hexagon = more sets

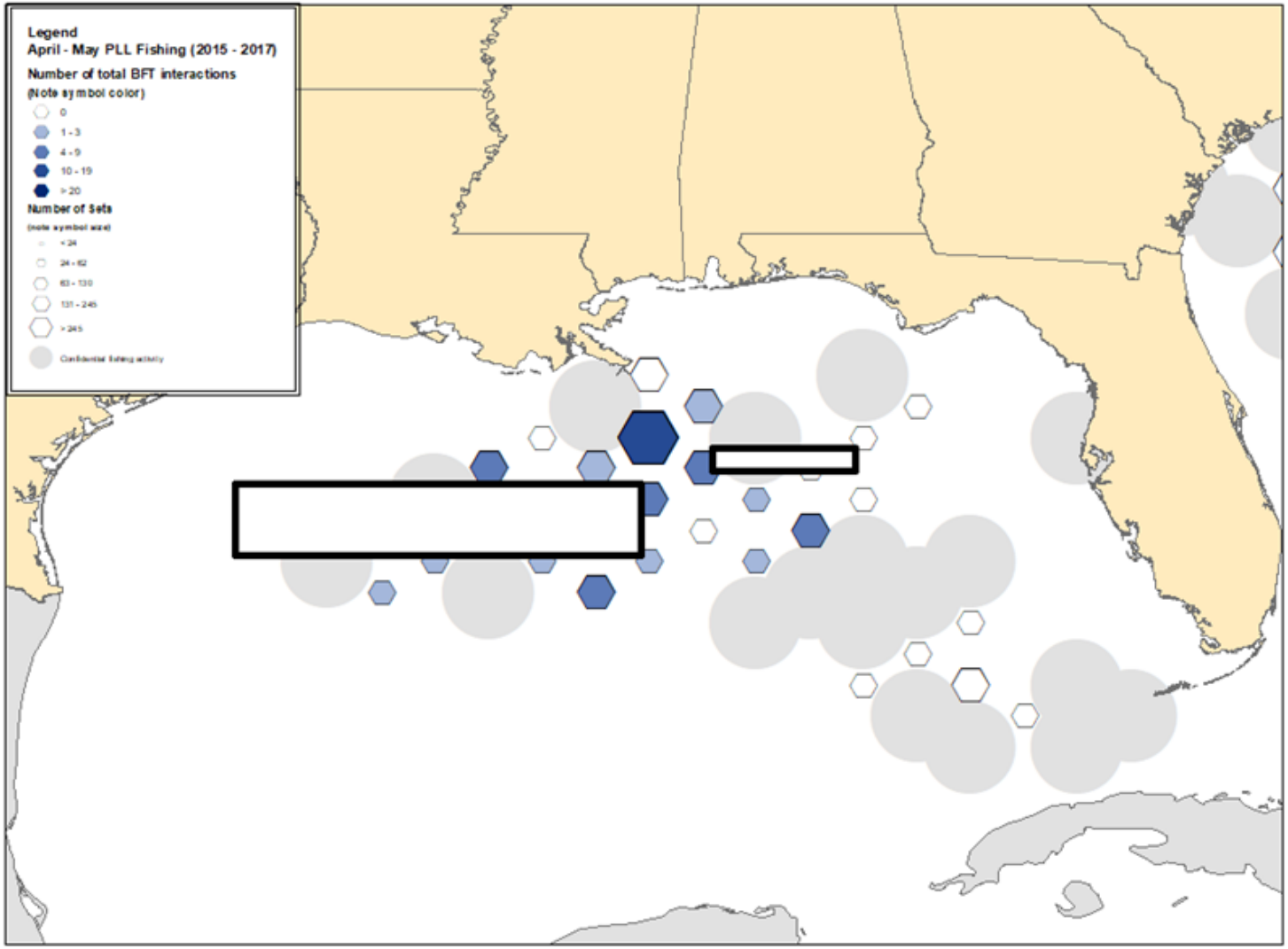

Figure C.3. Shot chart showing bluefin (BFT) interactions and effort for April-May, 2015-2017.
Darker color = more bluefin.
Larger size of hexagon = more sets

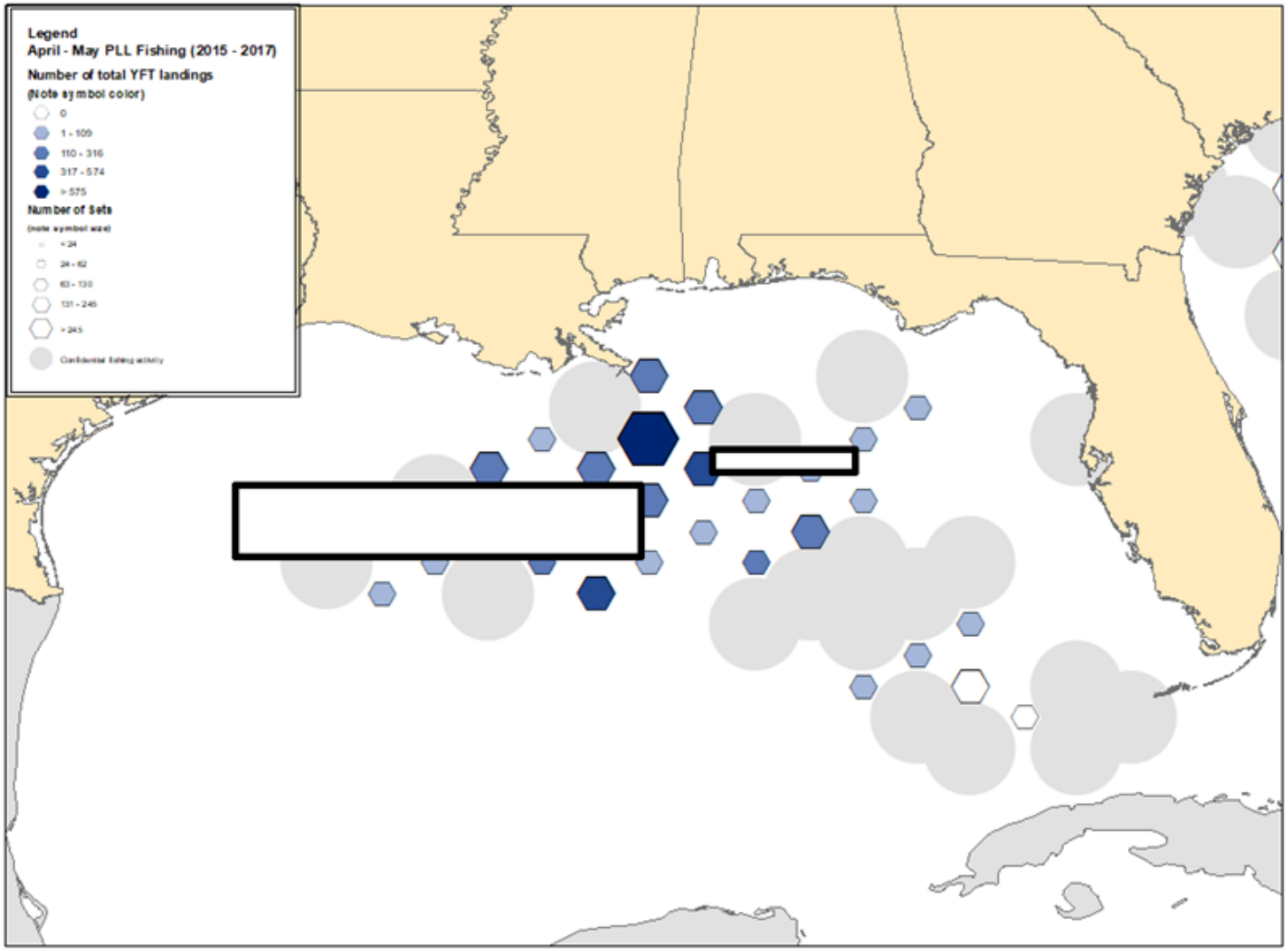

Figure C.4. Shot chart showing yellowfin tuna (YFT) interactions and effort for April-May, 2015-2017.
Darker color = more yellowfin landings
Larger size of hexagon = more sets

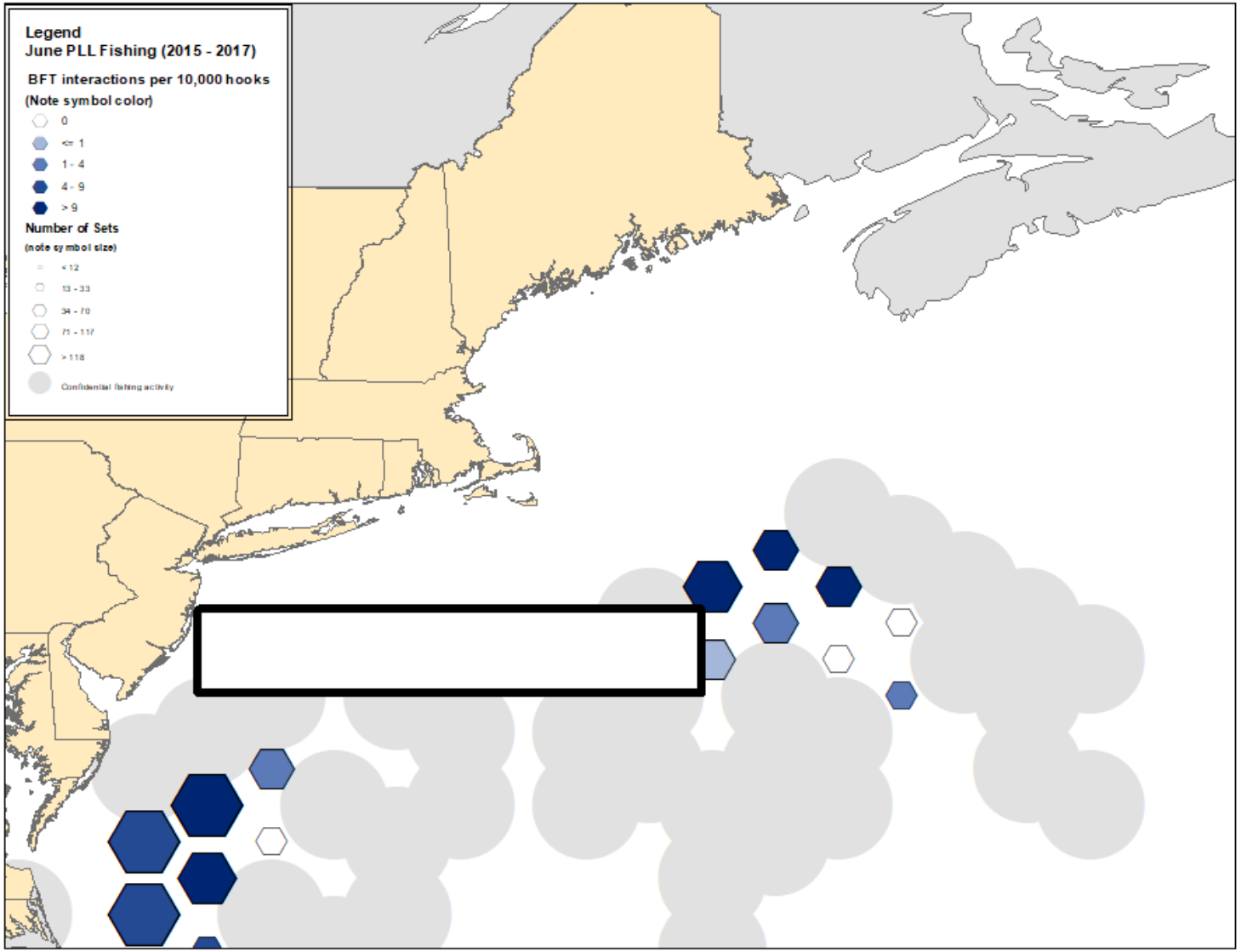

Figure C.5. Shot chart showing bluefin tuna (BFT) interactions per 10,000 hooks and effort for June, 2015-2017.
Darker color = higher CPUE (BFT interactions per 10,000 hooks)
Larger size of hexagon = more sets

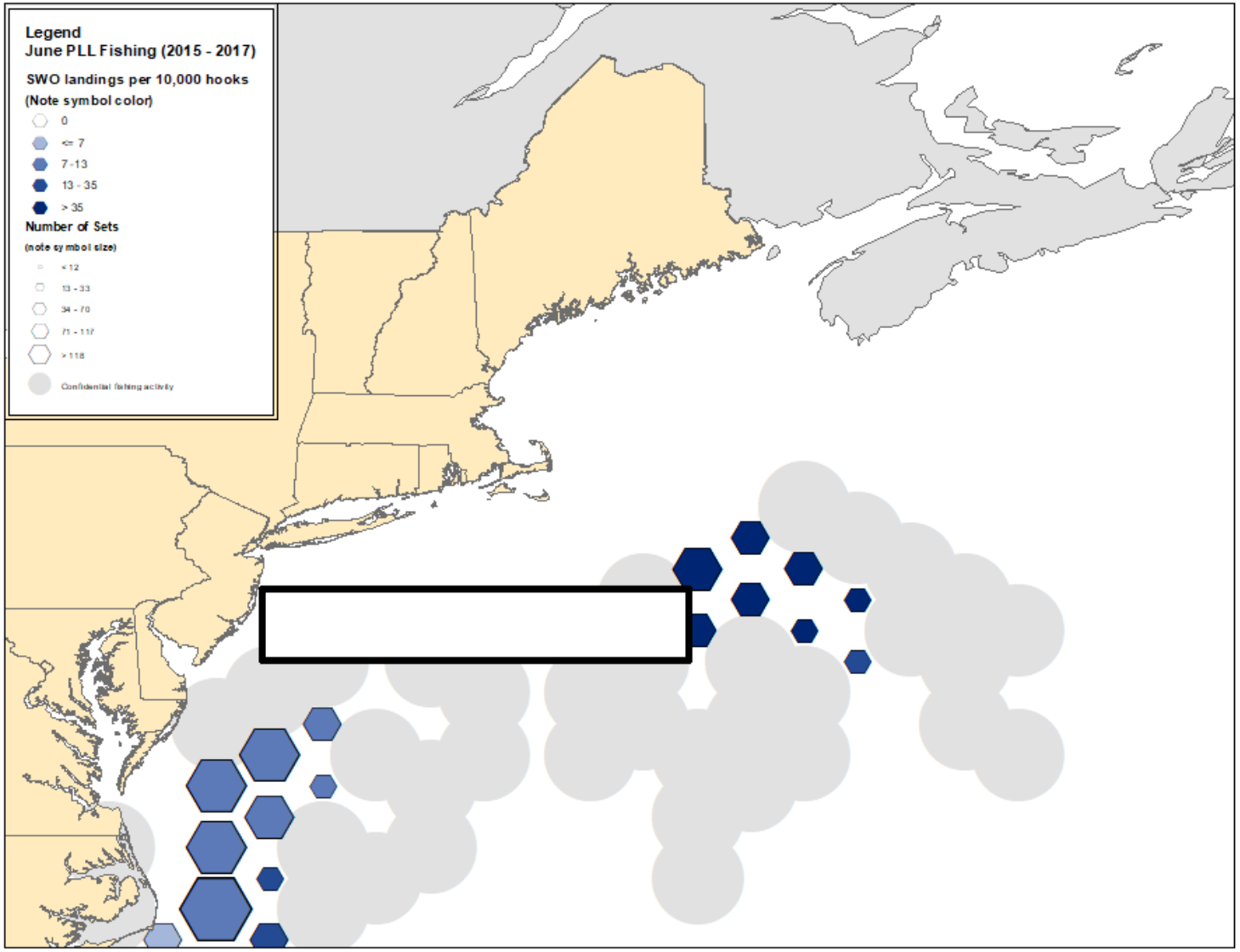

Figure C.6. Shot chart showing swordfish landings per 10,000 hooks and effort for June, 2015-2017.
Darker color = higher CPUE (swordfish interactions per 10,000 hooks)
Larger size of hexagon = more sets

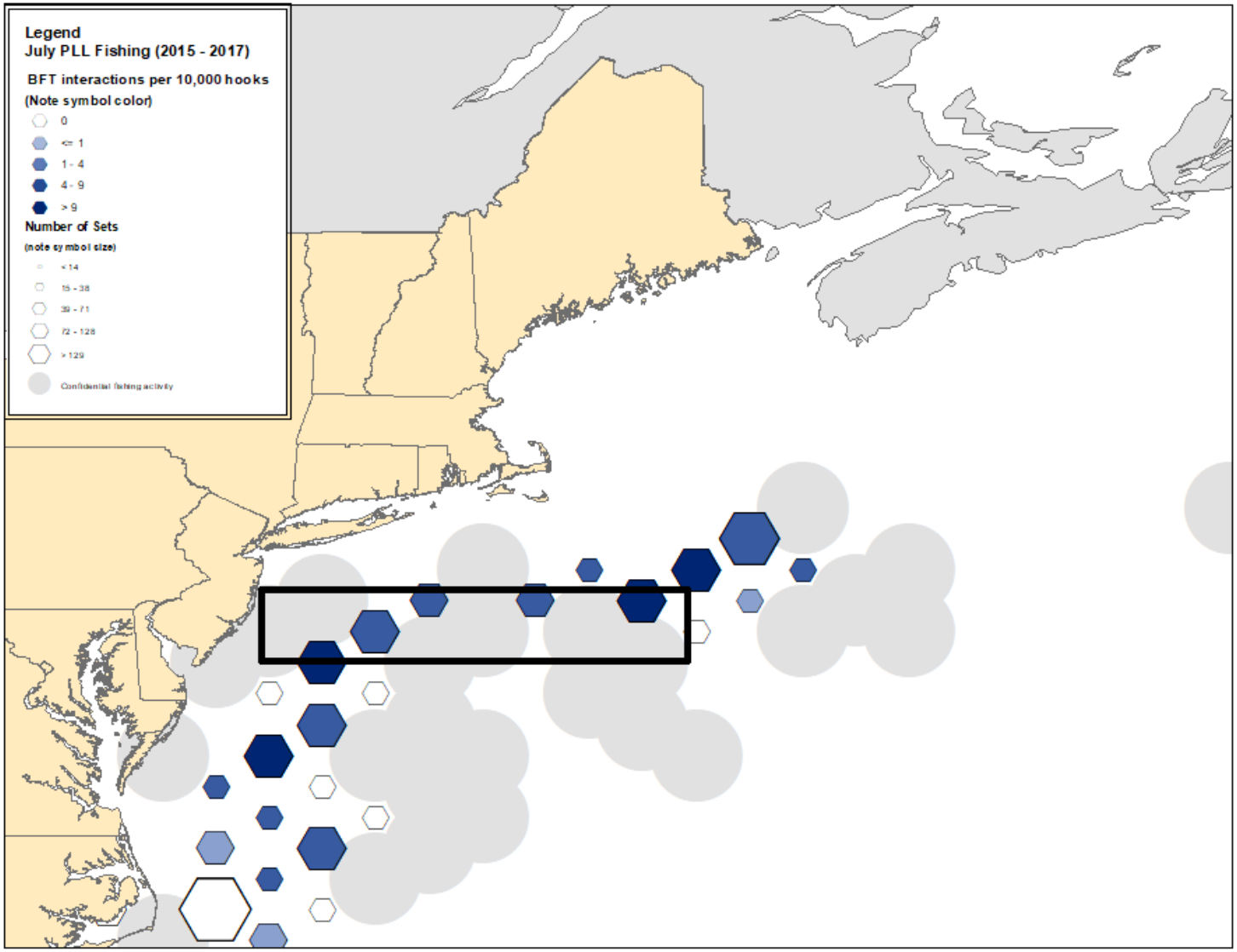

Figure C.7. Shot chart showing bluefin tuna (BFT) interactions per 10,000 hooks and effort for July, 2015-2017.
Darker color = higher CPUE (BFT interactions per 10,000 hooks)
Larger size of hexagon = more sets

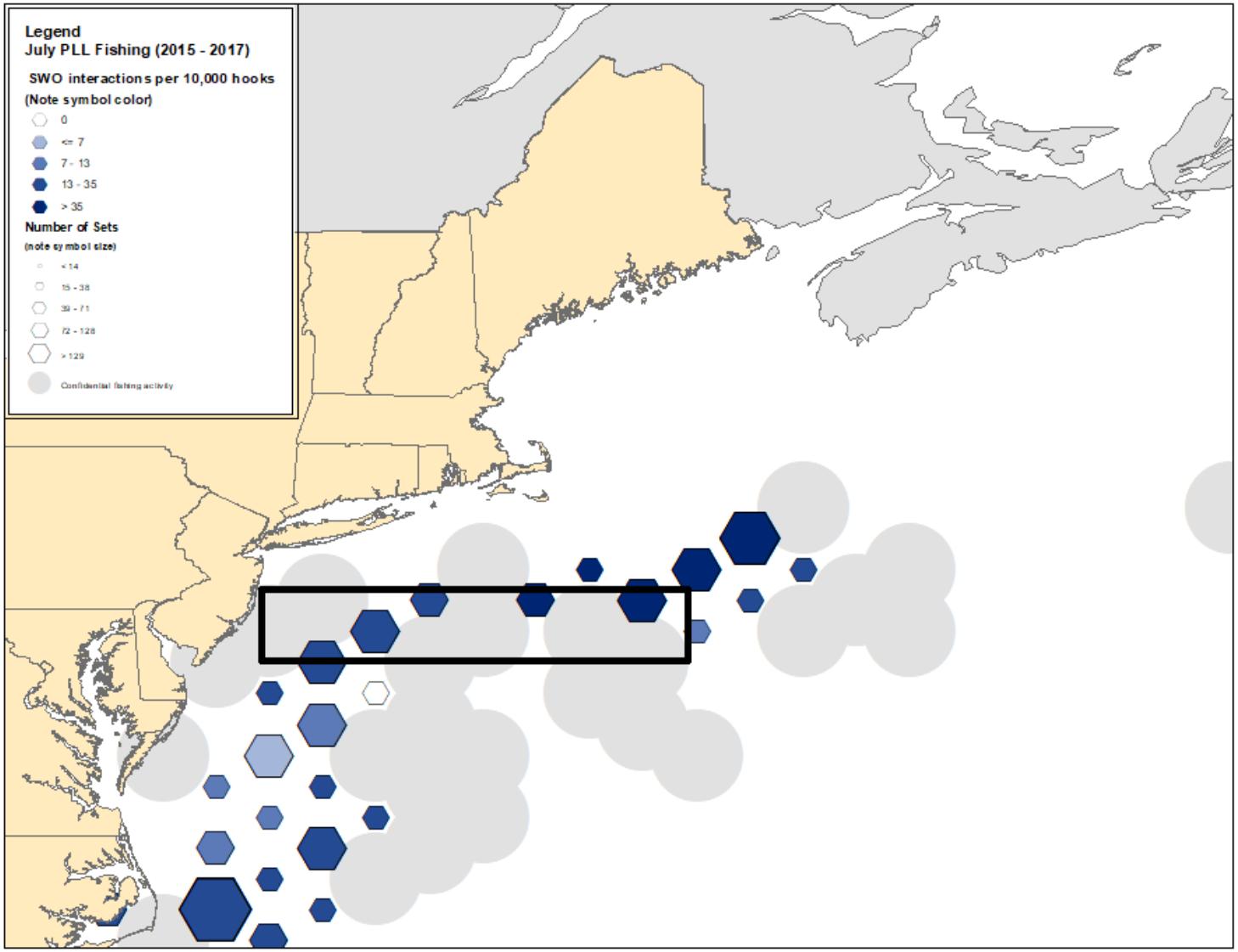

Figure C.8. Shot chart showing swordfish landings per 10,000 hooks and effort for July, 2015-2017.
Darker color = higher CPUE (swordfish interactions per 10,000 hooks)
Larger size of hexagon = more sets

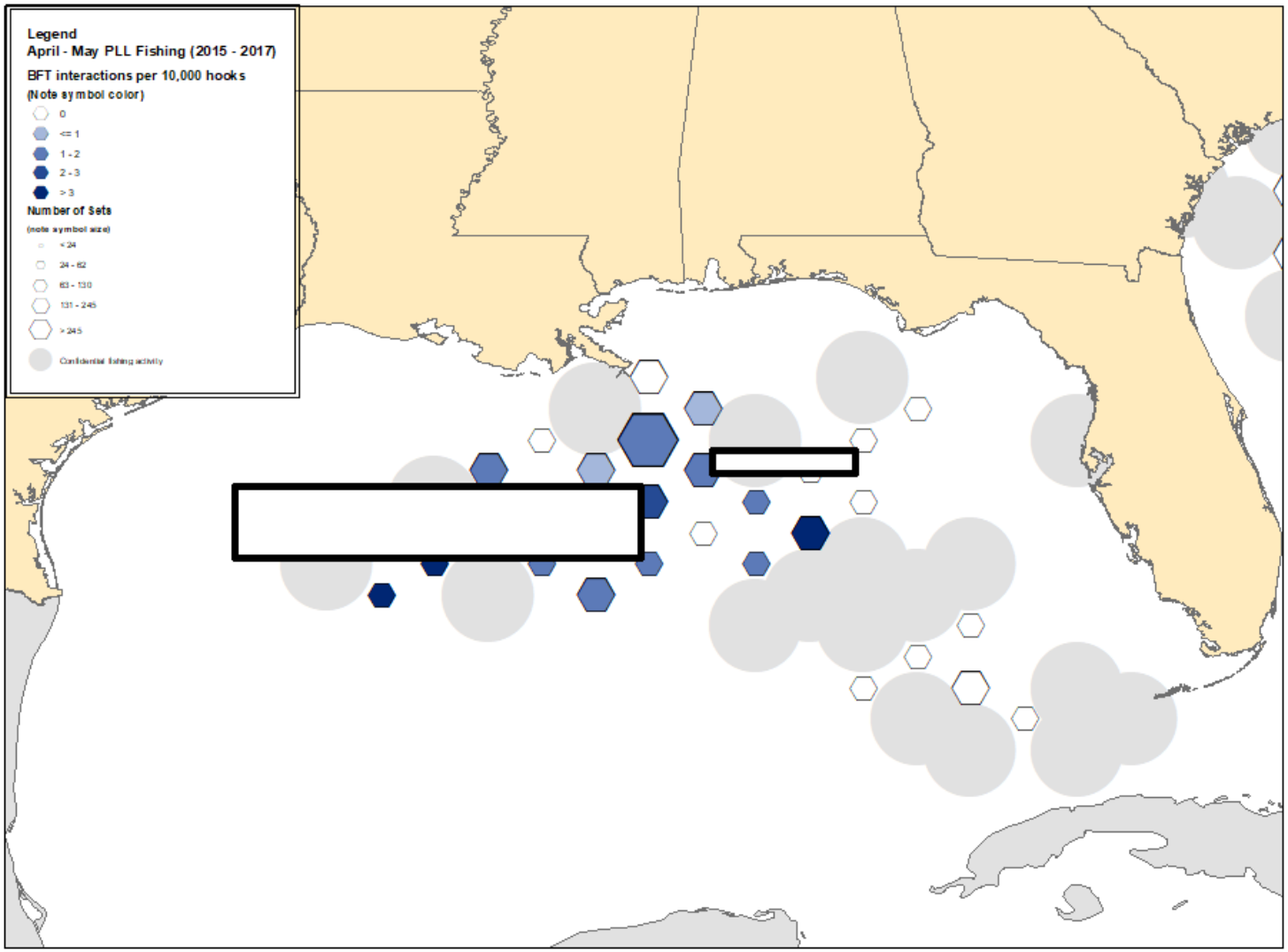

Figure C.9. Shot chart showing bluefin tuna (BFT) interactions per 10,000 hooks and effort for April and May, 2015-2017.
Darker color = higher CPUE (BFT interactions per 10,000 hooks)
Larger size of hexagon = more sets

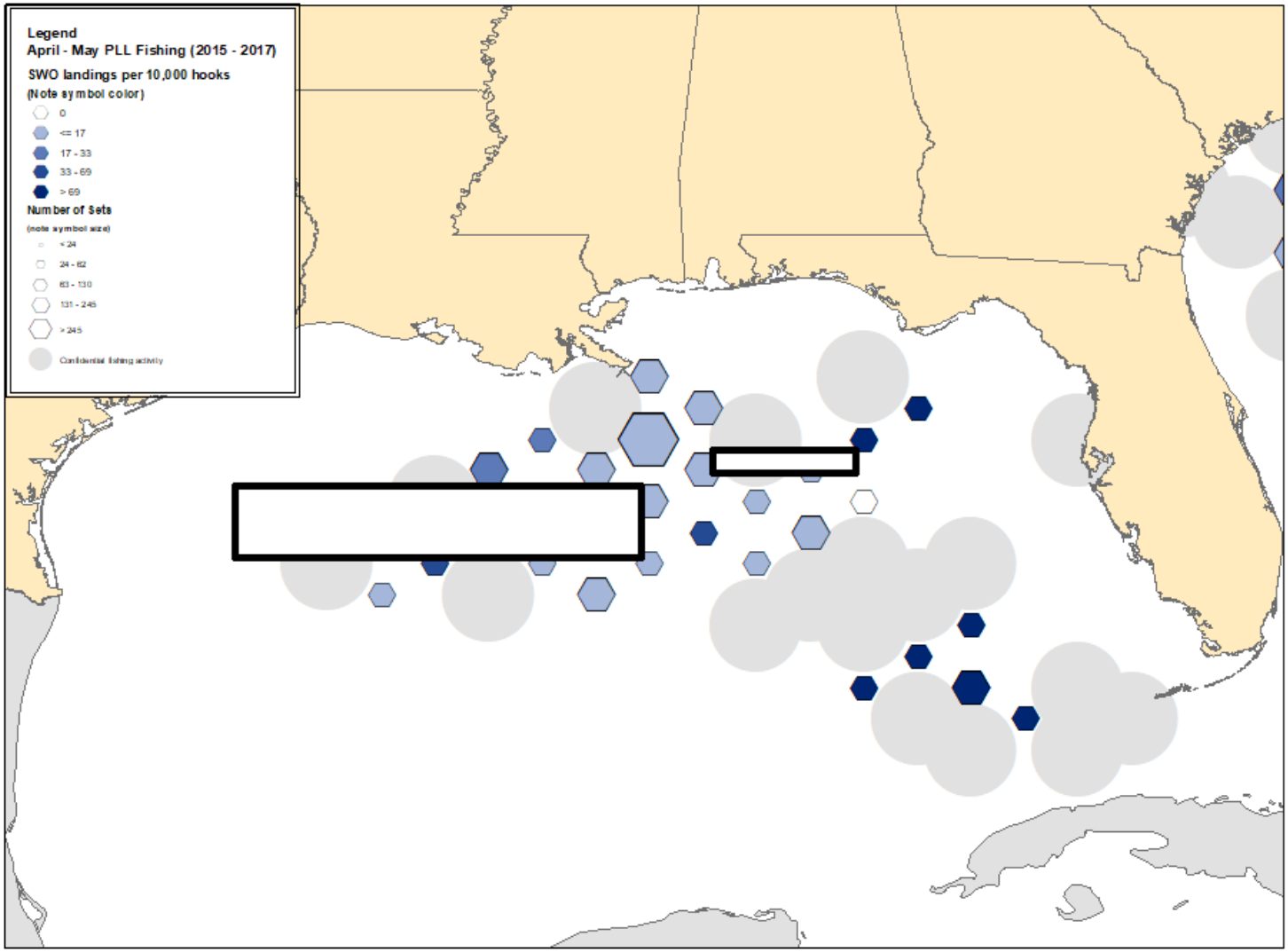

Figure C.10. Shot chart showing swordfish landings per 10,000 hooks and effort for April and May, 2015-2017.
Darker color = higher CPUE (swordfish interactions per 10,000 hooks)
Larger size of hexagon = more sets

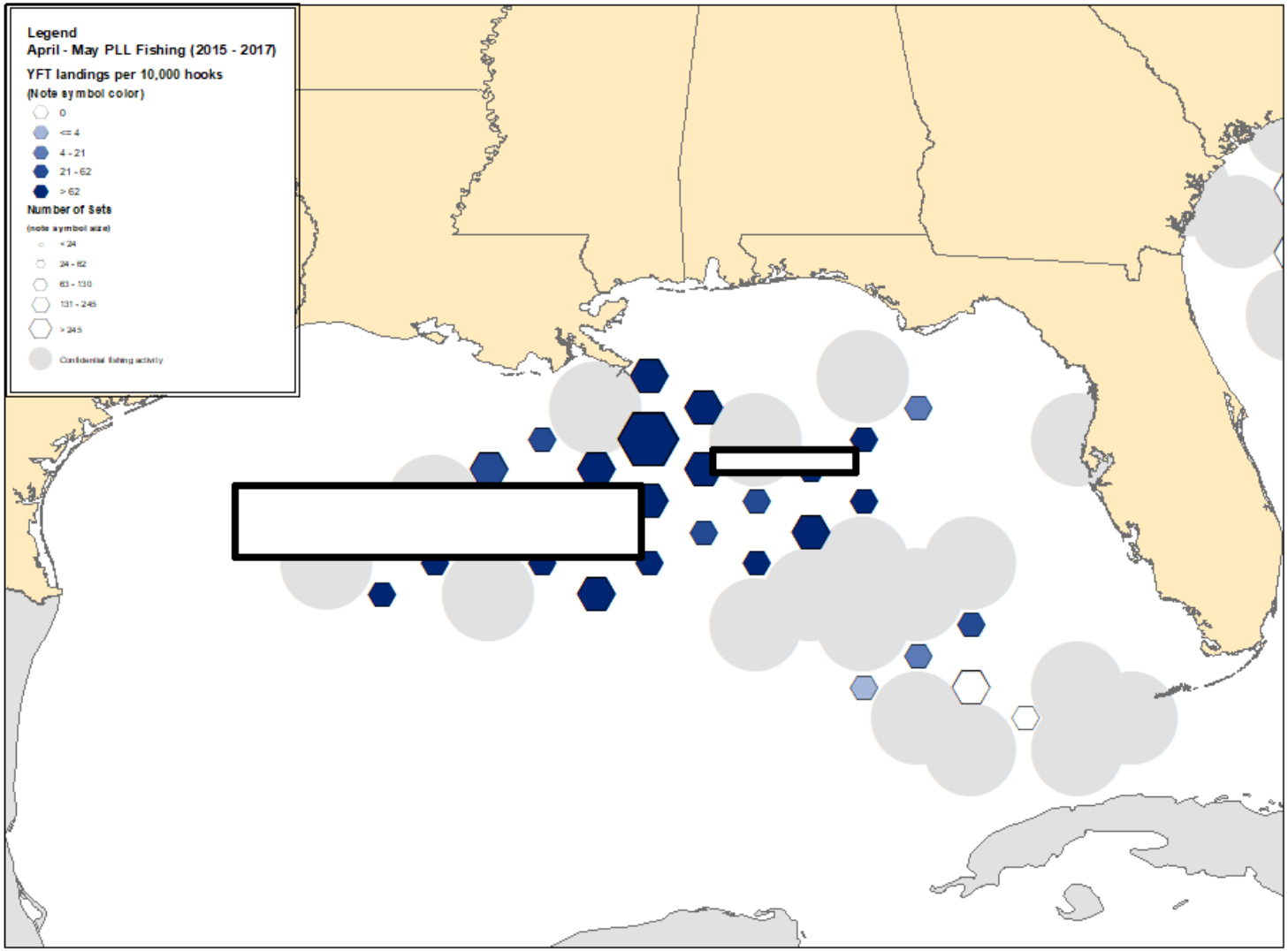

Figure C.11. Shot chart showing yellowfin tuna (YFT) landings per 10,000 hooks and effort for April-May, 2015-2017.
Darker color = higher CPUE (yellowfin interactions per 10,000 hooks)
Larger size of hexagon = more sets

11.4 Appendix D: Winter Gulf of Mexico Swordfish Fishery Data

During the comment period for the proposed rule, NMFS received several comments urging NMFS to entirely remove the weak hook requirement from an area in the southeastern Gulf of Mexico (shown in blue in Figure D.1), as opposed to modifying it to a seasonal requirement as in the weak hook Preferred Alternative. This area has a westward boundary of 88 degrees W longitude, an eastward boundary of 82 degrees W longitude, a northern boundary of 26 degrees N latitude, and the southern boundary is the U.S. EEZ. This area has an approximate area of 59,420 square miles. This area was noted in the comments during the proposed rule as being a particularly important area for targeting swordfish and having low bluefin tuna interactions. These comments also noted that weak hooks were affecting the catch rates of swordfish and in particular large swordfish were being lost to straightened hooks.

During the development of the FEIS, NMFS in response to these comments analyzed HMS logbook data from within the area described above. Table D.1 is a summary of HMS logbook data from all months in 2009 - 2011 (period before weak hook requirement was implemented) and 2015 - 2017 (a recent commensurate time period after weak hook requirement was implemented). Although one bluefin tuna was landed or discarded dead during the 2015-2017 time frame shown in Table D.1, that one bluefin tuna does not appear in the parallel data representation in Figures C.3 and C.9. This could be because the fish was caught in a month other than April or May or catch could have occurred in area where insufficient data existed to appropriately aggregate the data consistent with data confidentiality obligations. During the 2015-2017 period before implementation of weak hooks, 0-9 bluefin tuna were landed or discarded dead in this area, and CPUEs ranged from 0-0.5 bluefin tuna landed or discarded dead per 10,000 hooks. During the 2015-2017 period after implementation of weak hooks, 0-1 bluefin tuna were landed or discarded dead in this area and CPUE for all three years was zero. Although there were fluctuations in the catch rates for bluefin tuna before and after weak hooks were required, swordfish catch rates remained stable across both year ranges. The CPUE ranges in the period before weak hook implementation were 55.4-105.2 swordfish landings per 10,000 hooks and the CPUE ranges in the period after weak hook implementation were 58.9-105.9 swordfish landings per 10,000 hooks.

These data suggest that weak hooks are providing a conservation benefit to bluefin tuna while not impacting the levels of swordfish catch in this area. Catch rates of bluefin tuna did decrease after weak hooks were implemented and catch rates of swordfish remained relatively stable. Although NMFS did not create a new alternative in response to this comment, this Appendix is meant to be responsive to the comment and to explain the rationale for not further considering it as an alternative. NMFS notes that additional research in this area with respect to weak hooks and their effect on swordfish catch will be helpful to inform future management decisions. At this time the wholesale removal of the weak hook requirement is not being considered in the area shown in blue in Figure D.1.

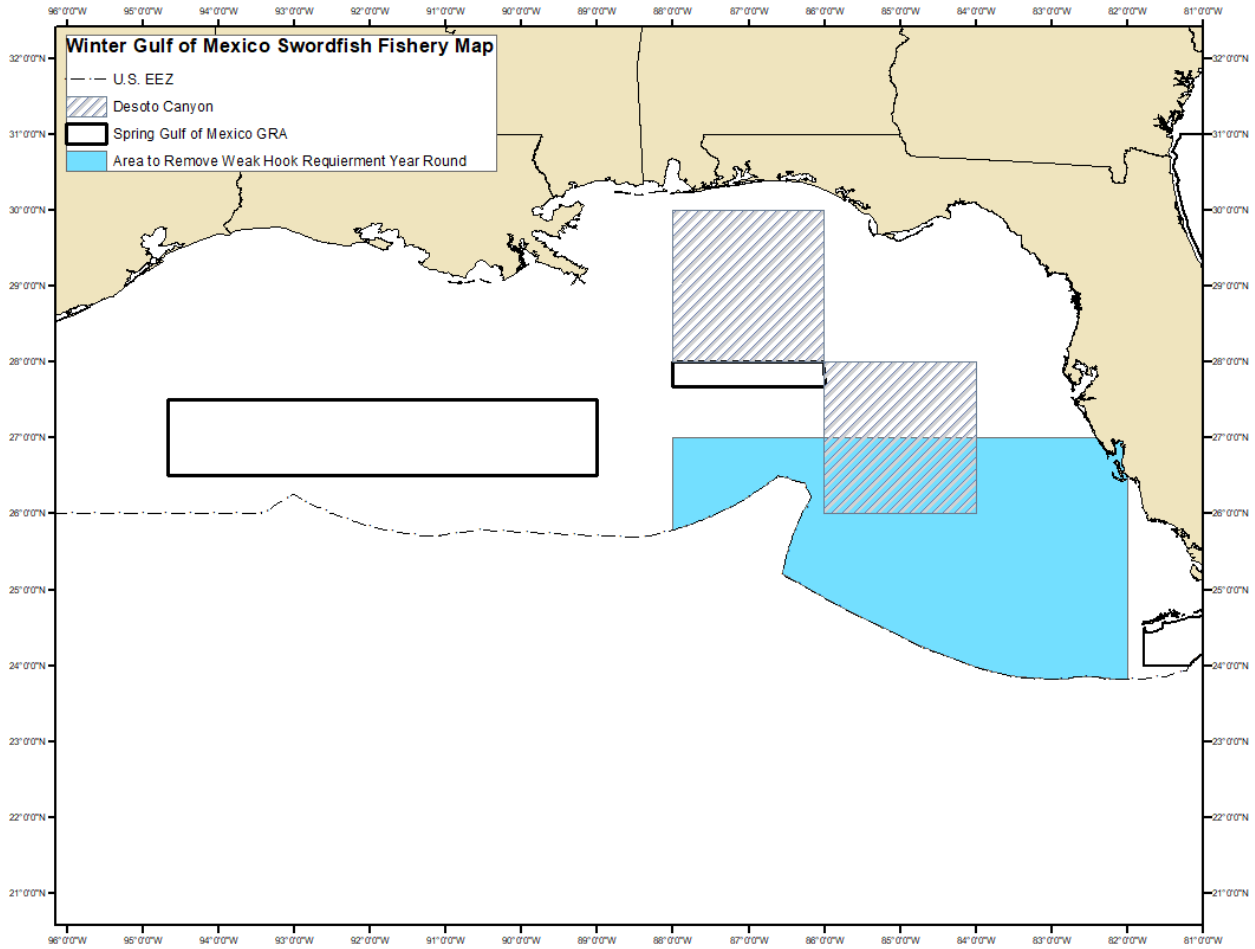

Figure D.1. Area identified in public comments to remove the weak hook requirement on a year round basis

Table D.1 Year round bluefin tuna and target species landings and discards from the blue area identified in Figure E.1.

Year	Hooks Fished	Swordfish Kept	Swordfish Discards	BFT Kept and Dead Discards	Yellowfin Tuna Kept	Yellowfin Tuna Discards	Swordfish Kept CPUE*	Swordfish Discard CPUE*	Bluefin Kept and Dead Discards CPUE*	Yellowfin Tuna Kept CPUE*	Yellowfin Tuna Discards CPUE*
2009	115,907	1,086	188	0	386	38	93.7	16.2	0.0	33.3	3.3
2010	136,018	753	185	4	903	6	55.4	13.6	0.3	66.4	0.4
2011	183,065	1,925	868	9	450	5	105.2	47.4	0.5	24.6	0.3
2015	68,551	404	202	0	402	8	58.9	29.5	0.0	58.6	1.2
2016	99,885	1,058	338	0	569	43	105.9	33.8	0.0	57.0	4.3
2017	214,557	1,861	360	1	1,496	74	86.7	16.8	0.0	69.7	3.4

11.5 Appendix E: Interpretation of Monthly Data Related to Gulf of Mexico Gear Restricted Area Impacts

E.1 Introduction

The information in this Appendix supports the Response to Comment 25 in Appendix F, below.

NMFS received a comment on the Proposed Rule and DEIS, which drew conclusions about the continued need for the Spring Gulf of Mexico Gear Restricted Area in tandem with the IBQ Program. The commenter concluded, based on a relatively simple analysis of a limited set of data, that the IBQ Program alone could not appropriately limit incidental catch of bluefin tuna by the pelagic longline fishery in the Gulf of Mexico.

NMFS considered the comment as presented, concluding that it oversimplified a number of relevant factors, and that the conclusions drawn were not consistent with those that would be drawn from a broader analysis. The comment did not present new, different, or additional information, and the commenter's assertions were not consistent with the conclusions drawn from a more thorough review. NMFS is not presenting any new or different information in this Appendix than was in the DEIS or the referenced Three-Year Review of the IBQ Program but presents it in a way specifically responsive to the comment. Given the length of the discussion, NMFS felt that inclusion of this information in the body of the FEIS or the Response to Comments might be confusing and thus includes it here.

Summary of Comment

The comment on the proposed rule and DEIS compared pelagic longline catch data from the Gulf of Mexico for the months of April and May. The comment refers to dead discards and landings of incidentally-caught bluefin tuna before (2012-2014) and after implementation of the IBQ Program and the Spring Gulf of Mexico Gear Restricted Area (2015-2016) and 2017. Referencing certain data presented in the Three-Year Review of the IBQ Program (Table E.1), the comment noted that the reduction in catch from two specific months when this gear restricted area was not in effect (i.e., February and March) was not identical to the reduction in catch that occurred during the months that the gear restricted area was in effect (i.e., April and May). Because of this, the comment argues that the reductions in catch could not be attributed to the IBQ Program alone, but are more associated with the Gear Restricted Area.

The comment analysis, however, does not fully weigh the number of variables that are potentially impacting the findings of the more in-depth analyses contained in the DEIS.

This Appendix reviews pelagic longline catch data from the Gulf of Mexico prior to and following the implementation of the Spring Gulf of Mexico Gear Restricted Area and the IBQ Program in Amendment 7 and refers to this information in the Response to Comment section in Appendix F.

Table E.1. Summary of Bluefin Landings Data presented in the Three-Year Review of the IBQ Program*

Month	Total Landings (2012-2014) (A)	Total Landings (2015-2016) (B)	% Reduction in Landings? (B – A) / A * 100 = (C)
January	33	5	-85%
February	26	10	-62%
March	43	14	-67%
April	50	7	-86%
May	47	7	-85%
June	11	5	-55%

*Columns A and B of this table appeared in the Three-Year Review document as part of *Table 6.32, "2012-2017 PLL Bluefin Landings in the Gulf of Mexico by Month."*

E.2 Methods

NMFS used ArcGIS 10.3, software which allows querying of maps and analysis of geographic information, to tabulate bluefin tuna landings and discards (alive and dead) from HMS logbook set data reported by pelagic longline vessels that fished in areas of the United States EEZ and the high seas within the Gulf of Mexico open to pelagic longline fishing (i.e., areas in white in Figure E.1). These data were filtered by date to extract data from different time periods used in this analysis to consider the information provided within the public comment. Although they are presented in a different format in this Appendix, these data were presented in the DEIS and scoping document graphically in maps depicting spatial distribution of catch (i.e., total interactions and CPUE of bluefin retained and discarded), and summarized in tables depicting total numbers of bluefin captured by year in the Gulf of Mexico.

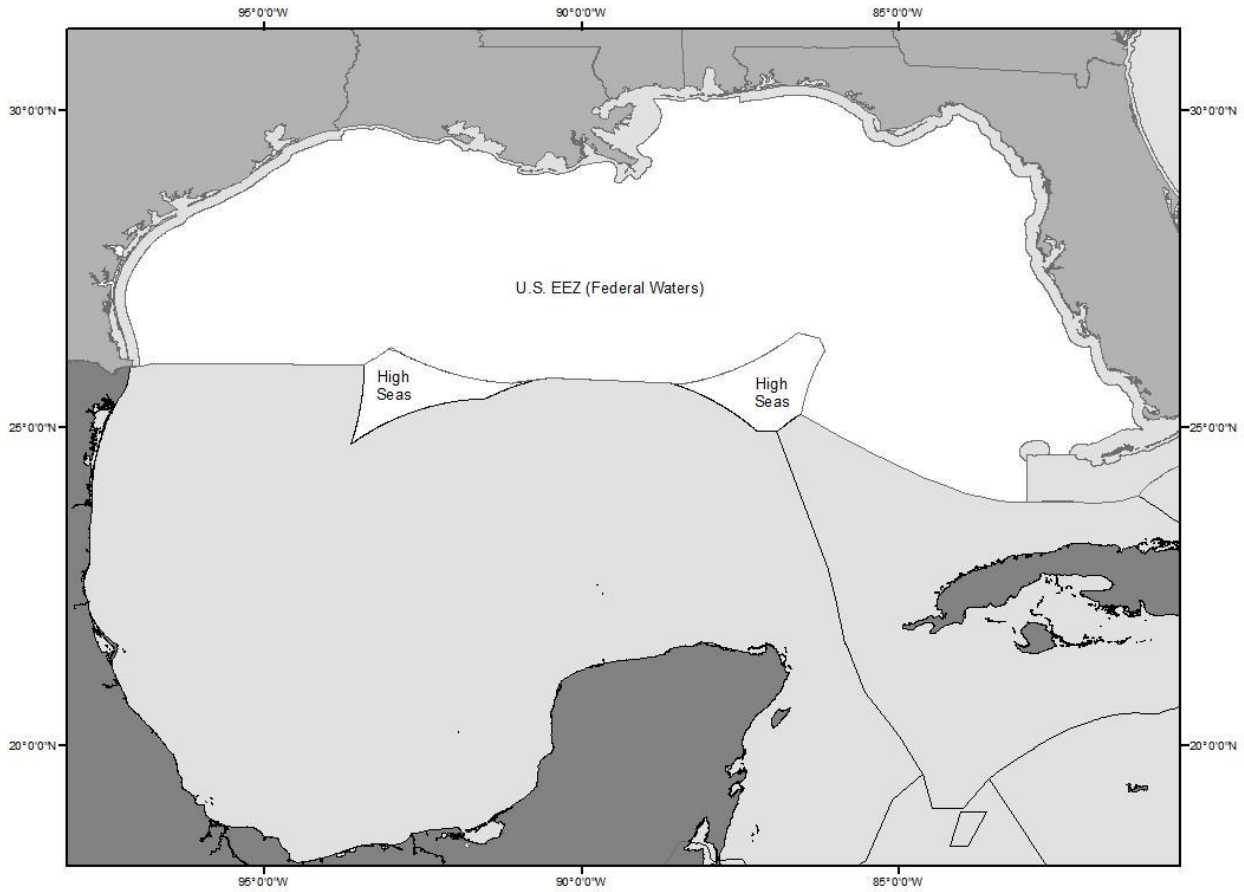

Figure E.1. Gulf of Mexico and High Seas Areas (white polygons) Used to Extract Overlapping Atlantic HMS Pelagic Longline Logbook Data in GIS Analyses.

In 2015, NMFS implemented Amendment 7 to the 2006 Consolidated Atlantic HMS FMP, which resulted in substantial changes to the management of the pelagic longline fishery for Atlantic HMS, particularly in relation to incidental catch of bluefin tuna. Specifically, NMFS transitioned from managing and limiting bluefin tuna incidental catch using a target catch requirement to managing and limiting such incidental catch under the IBQ Program. The target catch requirement provided controls on the number of incidentally-caught bluefin tuna that could be landed based on the amount of target species retained. Vessels could only land up to three bluefin tuna; additional fish had to be discarded. In contrast, under the IBQ Program, pelagic longline vessels are individually accountable for every bluefin landed or discarded dead given the requirement to account for such catch with IBQ allocation. Appropriate limits are placed on available IBQ allocation in the Gulf of Mexico as set out in Amendment 7. The target catch method only addressed a reduction in landings of bluefin tuna and did not provide a more comprehensive reduction in catch as was realized with the implementation of Amendment 7 in January 2015.

This appendix more fully demonstrates the complexity of the interplay of the suite of variables influencing the conclusions of the DEIS. NMFS calculated the percent change

from the pre-Amendment 7 period (2012-2014) and the post-Amendment 7 period (2015-2016) for several variables associated with reported bluefin tuna catch data, including total interactions, estimated mortality, discards (live and dead), and landings. The available information is shown graphically to provide a better visual representation of any trends in the existing data.

NMFS computed mortality as all bluefin tuna landed or discarded dead plus 29% of the fish bluefin tuna released alive, using the high end of the estimated post-release mortality rate from tagging and observer studies. (Orbesen et al. 2018, indicating a post-release mortality rate of 12-29 percent in the pelagic longline fishery).

NMFS includes Table E.1, which provides information that was presented in Table 6.32 of the Three-Year Review of the IBQ Program, in this appendix for ease of reference. In order to address the conclusions of the comment on percent reductions across years for particular monthly timeframes, NMFS standardized trends by year. Furthermore, the public comment noted a difference in percent change in landings by month without computing that percent change. In order to respond more directly to the comment, NMFS added Column C to Table E.1 to compute the percent change by month before and after implementation of Amendment 7 measures. The comment compared an uneven number of years before (2012-2014, i.e., 3 years) and after (2015-2016, i.e., 2 years) implementation of Amendment 7, which might influence results since more years presumably result in more data and influences the weight of the variables influencing catch.

NMFS analyzed data from different time periods in an effort to balance out the suite of variables that could have influenced information derived from the pelagic longline fleet's operations in the Gulf of Mexico. NMFS reviewed data analyzed in Amendment 7, noting vessel behavior in this time period (2006 – 2012) may have been influenced by events such as the Deepwater Horizon oil spill, and/or the various hurricanes, and/or changing regulations. Comparing catch rates from HMS logbook data collected in 2006 – 2012 against data collected after implementation of Amendment 7 measures (e.g., 2015-2017) might be influenced by the implementation of weak hooks in 2011. Research by the SEFSC showed a statistically significant decrease in bluefin tuna catch rates with the use of weak hooks. For comparison purposes, this regulation on hook types introduces a variable that does not allow for a direct, "apples-to-apples" comparison of the data as both datasets were not collected with identical conditions. Reductions in bluefin tuna catch rates might therefore be a product of Amendment 7 measures and a "post-implementation" time period in which weak hook regulations were applicable each year, thus further demonstrating the need for more complex analyses of these sorts of variables to accurately portray what is transpiring in the fishery, versus just looking at an overall reduction.

In addition to information supplied in the comment commenter (2012-14, 15 and 16), an additional two years of information have been collected by NMFS reflecting fishery operations under the Amendment 7 management measures. That updated data has been used throughout the FEIS as previously noted. NMFS considered the information presented in the comment, but also noted that trends in landings and other variables (e.g.,

total interactions, catch and discards) may be heavily influenced by the inclusion of data from years that have extenuating circumstances such as hurricanes, the Deepwater Horizon Oil Spill, or changes in the availability of swordfish to pelagic longline gear. NMFS therefore presents fishery data trends using both the time series of logbook data analyzed in Amendment 7 (2006 – 2012); logbook data from a time period immediately prior to Amendment 7 implementation (2012-2014); and data reported from pelagic longline vessels after Amendment 7 implementation (2015 – 2018).

E.3 Results and Discussion

With respect to the data referenced in the public comment, NMFS noted that standardizing the data against the number of years analyzed generally reduced the percent change in landings compared to the data presented in Table E.1. Average annual landings were reduced in February and March by 42 and 51 percent, respectively (Column (C), Table E.2). Average annual landings in April and May were reduced by 79 and 78 percent, respectively (Column (C), Table E.2).

Table E.2. Standardized Trends in Bluefin Landings Data Before and After Implementation of the IBQ Program and Spring Gulf of Mexico Gear Restricted Area (2012-2014 versus 2015-2016).

Month	Total Landings (2012-2014) (A)	Total Landings (2015-2016) (B)	% Reduction in Landings (B – A) / A * 100 = (C)
January	11	2.5	-77%
February	8.67	5	-42%
March	14.33	7	-51%
April	16.67	3.5	-79%
May	15.67	3.5	-78%
June	3.67	2.5	-32%

As explained above, Table E.2 shows the information presented by the commenter with an additional calculation to indicate percent change in Column C. Table E.3 shows the results of the same type of comparison suggested by the commenter (i.e., percent change in landings), but also summarizes percent change in different variables that were included in analyses presented in the DEIS. This table also includes an additional year of data such that these analyses are consistent with the timeframe of impacts analyses presented in Chapter 4 of the DEIS. A comparison of data presented in Table E.2 and Table E.3 suggests the influence that a single year of data can have on the trends raised in public comment.

NMFS found, in querying the data from open areas of federal waters and the high seas in the Gulf of Mexico, that adding a year (2017) of post implementation data increases the percent reduction of average annual bluefin landings in February (e.g., -42% as shown in Table E.2 versus -74% as shown in Table E.3), March, April and May. The reduction in landings and catch rates of landed fish for the February-March period was less than the observed reduction in landings for the April-May period (Figure E.2 and Figure E.3).

Following implementation of Amendment 7 management measures, the peak landings and catch rates of landed fish flipped to months during which the gear restricted area was not effective. There were notable changes in effort (number of hooks set) between February-March and April-May before and after implementation of Amendment 7 measures (Figure E.4). Effort in February-March and April-May was similar in the Gulf of Mexico in 2012-2014. After implementation of the IBQ Program and Spring Gulf of Mexico Gear Restricted Area (2015-2017), effort was much higher in February-March. However, the difference in landings and catch rates between February-March and April-May was also much smaller after implementation of Amendment 7 (i.e., compare the light blue bars in Figure E.2 and E.3).

In general, the percent reduction in total interactions, mortality, discards, and dead discards was greater in April-May than in February-March (Table E.3), however the magnitude of the change across months varies across these different variables.

Table E.3 Percent Change in Average Annual Catch Data from Pelagic Longline Logbook Data from Sets Deployed in Open Areas of the Gulf of Mexico (2012 – 2014 versus 2015-2017)

Month	Interactions	Mortality	Discards	Dead Discards	Landings
January	-66.67%	-69.13%	-33.33%	-25%	-76%
February	-70.73%	-68.12%	-66.67%	-43%	-74%
March	-49.43%	-50.31%	-34.78%	-17%	-66%
April	-86.93%	-87.91%	-85.94%	-88%	-90%
May	-74.83%	-80.64%	-67.03%	-79%	-88%
June	13.33%	-11.01%	11.11%	-43%	22%

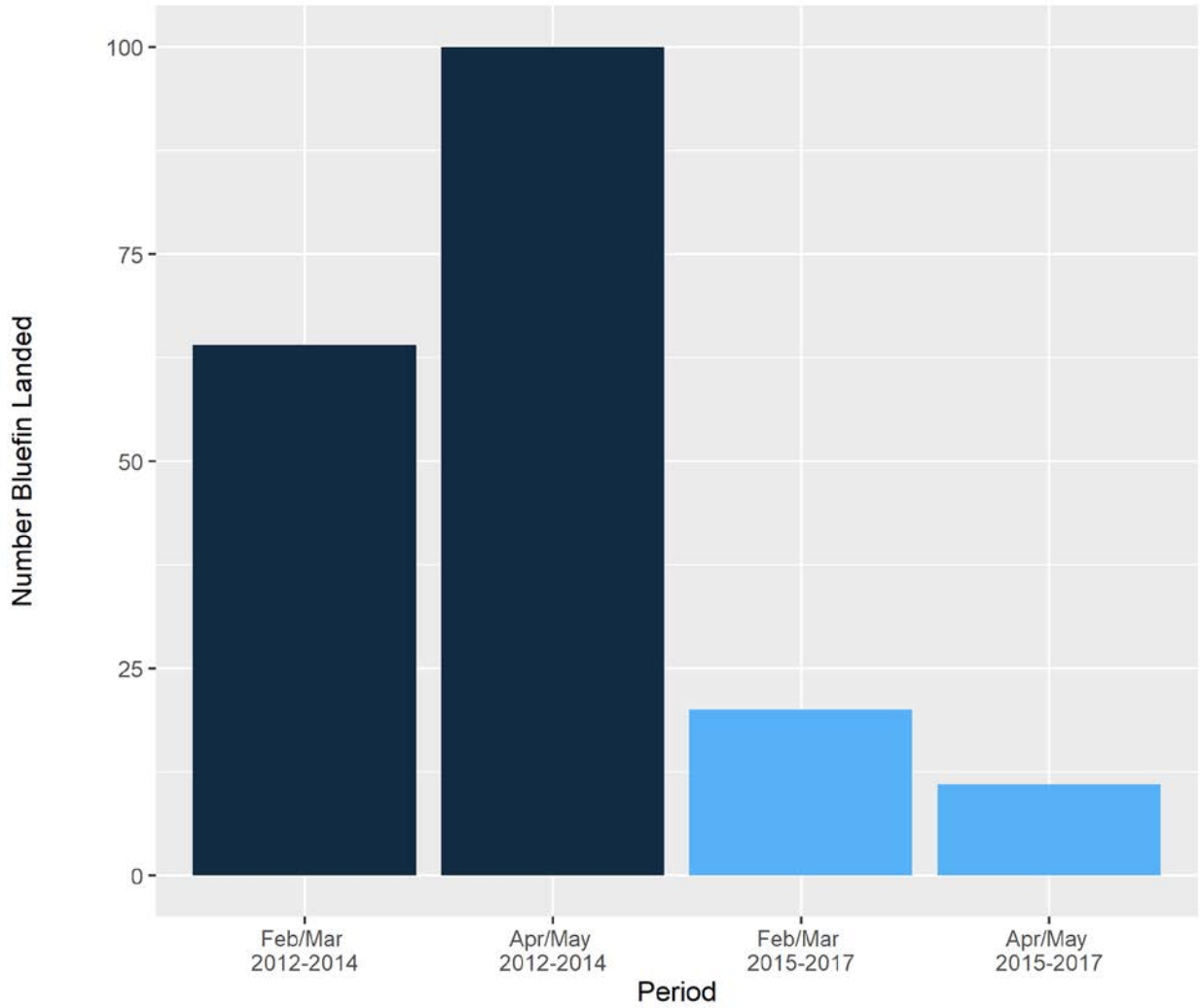

Figure E.2. Comparison of bluefin landings in Feb-March and April-May, before (dark blue) and after (light blue) implementation of Amendment 7.

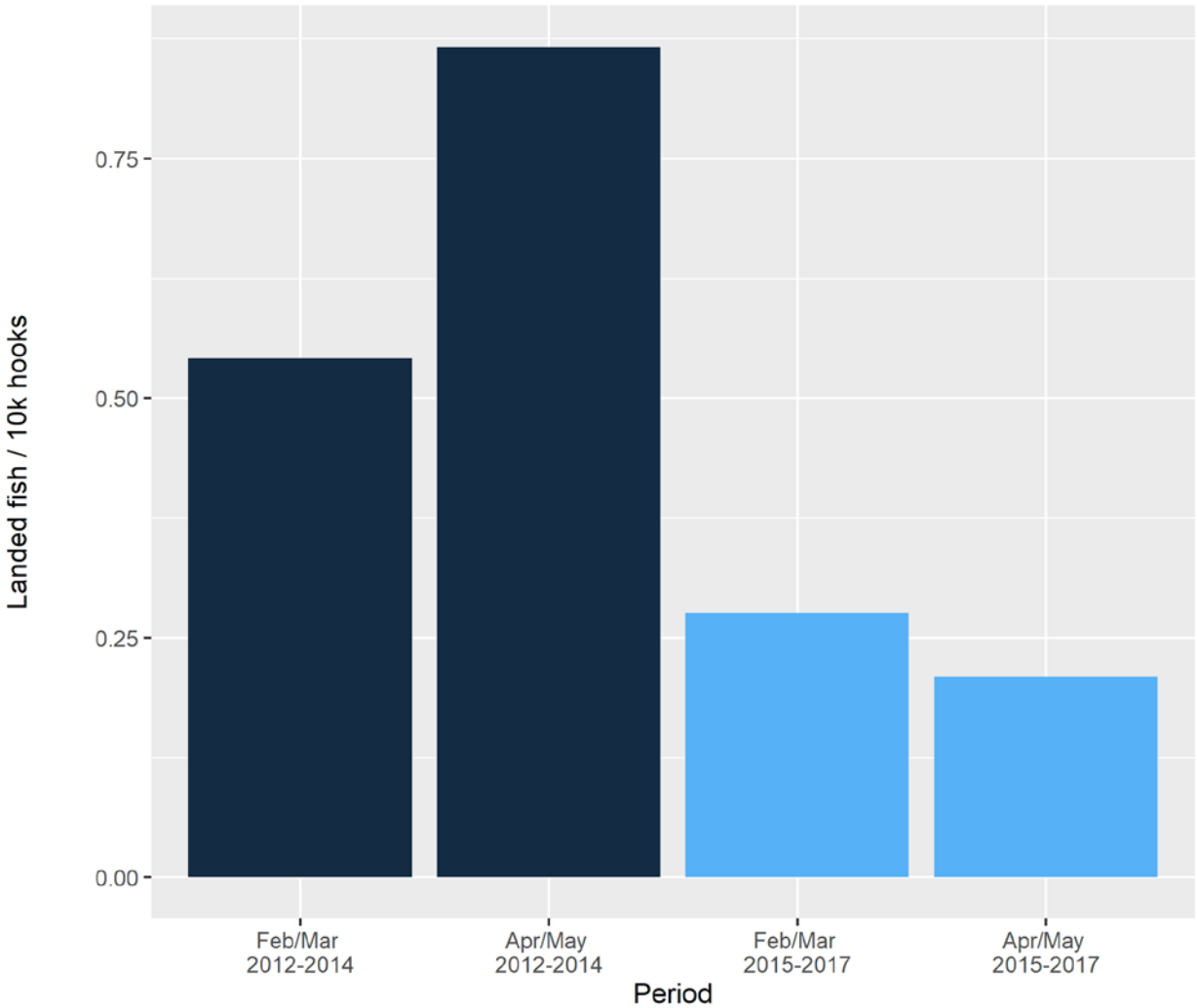

Figure E.3. Comparison of catch rates of landed bluefin in Feb-March and April-May, before (dark blue) and after (light blue) implementation of Amendment 7.

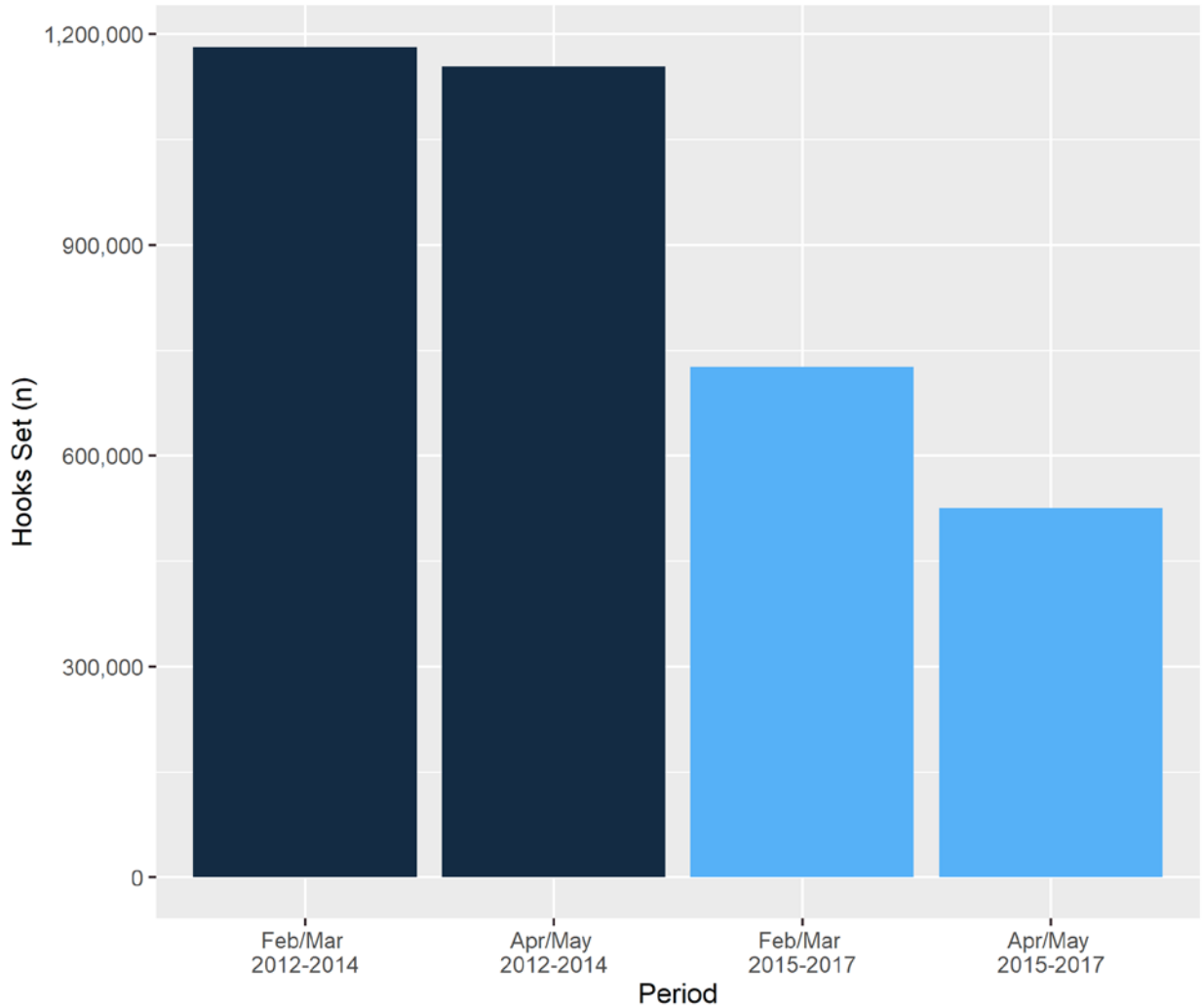

Figure E.4. Comparison of total hooks set (deployed) in Feb-March and April-May, before (dark blue) and after (light blue) implementation of Amendment 7.

The percentage change in landings varies when comparing individual months across historical (2006-2012) and modern (2015-2018) time periods. For example, the reduction in average annual landings was similar in February (-89%), April (-88%) and May (-88%) when comparing logbook data reported between these two time periods (Table E.4). In general, the percent reduction in average annual mortality, discards, and dead discards was greater in April-May than in February-March (Table E.4), however in some cases the differences were extremely small. For example, the reduction in average annual interactions and mortality was also similar in February (-84% interactions and -85% mortality) and May (-83% interactions and – 88% mortality). One anomaly to this trend was the change in average annual interaction rates. The reduction in average annual interactions of 83.67 percent in February was slightly higher than the reduction in average annual interactions observed in May (-82.78 percent) (Table E.4).

Table E.4 Percent Change in Average Annual Catch Data from Pelagic Longline Logbook Data from Sets Deployed in Open Areas of the Gulf of Mexico (2006 – 2012 versus 2015-2018)

Month	Interactions	Mortality	Discards	Dead Discards	Landings
January	-72.47%	-74.64%	-41.67%	-34%	-80%
February	-83.67%	-84.62%	-70.12%	-65%	-89%
March	-58.71%	-56.86%	-51.76%	-37%	-68%
April	-91.21%	-91.67%	-92.01%	-94%	-88%
May	-82.78%	-87.59%	-80.82%	-92%	-88%
June	20.69%	-5.43%	32.27%	-28%	-13%

As indicated above, this appendix provides a high-level summary of data pertaining to a public comment. NMFS is providing additional discussion, including interpretation of the comment and of the information discussed here, in the Response to Comment (Appendix F, Comment #25).

11.6 Appendix F: Comments and Response to Comments Received Concerning the DEIS and Proposed Rule

Response to Comments

General Rulemaking Comments

Comment 1: NMFS received comments in favor of and in opposition to the implementation of changes to gear restricted areas. Commenters supported changing the gear restricted areas to monitoring areas for a variety of reasons, such as collecting more data to determine a future action, and balancing the objective of protecting bluefin tuna and optimizing the harvest of target species. Other commenters opposed changes to the gear restricted areas because existing management measures have been effective at reducing bluefin tuna dead discards that they characterize as having led to a recent rebound of the bluefin stock and should be kept in place. Commenters opposed to changes in the gear restricted area also noted that the IUCN has identified bluefin as a "critically endangered" species. Commenters opposed to the evaluation processes described under Preferred Alternatives A4 and C3 noted that if the threshold is not met during the review process for the monitoring areas (and thus the area would not be closed for the following year), the process does not allow for other responsive action if needed. Some commenters noted that fisheries regulations should be based on the best available science to facilitate continued recovery. Other commenters felt that NMFS should not implement any measures that would increase bluefin tuna mortality on the spawning grounds.

Response 1: NMFS agrees that existing management measures such as the gear restricted areas and weak hooks have been effective at reducing bluefin tuna interactions and dead discards but also notes that available quota for pelagic longline fishery target species has gone unharvested under the current management measures and that the fishery has caught well below the available IBQ allocation each year since Amendment 7's implementation. NMFS agrees that the preferred alternatives are consistent with balancing the objectives of this rulemaking. NMFS agrees with commenters that it is important to collect additional data to help inform any potential future action for certain spatially managed areas that have been closed for extended periods of time. This is certainly the case when the lack of fishery-dependent or -independent data creates high levels of uncertainty. To address such uncertainties, for instance NMFS prefers to undertake an evaluation process for removal of certain restrictions to collect data from pelagic longline vessels fishing in what would become monitoring areas under the preferred alternatives. Aside from establishing a path to evaluation, the preferred alternatives also balance the objectives to *"optimize the ability of the fleet to harvest target species quota"* (via reopening previously closed areas) and to *"continue to minimize bycatch and bycatch mortality of bluefin*" (via thresholds established for each area and the expectation that vessels still must abide by the requirements of the IBQ Program and use weak hooks). Because both the Gulf of Mexico Gear Restricted Area and the IBQ Program were implemented at the same time, it is difficult to isolate the specific ecological impacts of the gear restricted areas alone. Data collected during

evaluation periods would either support or refute the contention that gear restricted areas or closed areas established to minimize bluefin catch within the IBQ allocation levels adopted in Amendment 7 or whether they continue to be needed in addition to the IBQ Program. Similarly, NMFS has determined that implementing an evaluation process for the Northeastern United States Closed Area also reflects the best balance of objectives for this rulemaking.

NMFS also agrees that the Cape Hatteras Gear Restricted Area reduced bluefin tuna interactions and discards in the pelagic longline fishery. The preferred alternative to remove the Cape Hatteras Gear Restricted Area is consistent with the objective of this action to "simplify and streamline HMS management by reducing redundancies in regulations" given that it appears that not all of the regulations in place are necessary to appropriately limit incidental bluefin tuna catch in the pelagic longline fishery within the limits established in Amendment 7. The Cape Hatteras Gear Restricted Area was implemented under an access determination system that granted access to vessels that demonstrated high rates of bluefin avoidance and compliance with observer and reporting requirements. The area was based on identification of a bluefin tuna interaction "hotspot" that occurred from 2006 to 2012 that was used to delineate the boundaries of this gear restricted area (e.g., Figure 4.9 of the FEIS for this rule). It was uncertain at the time of Amendment 7 implementation whether the IBQ Program implementation alone would have the intended effects in relation to issues with the pelagic longline fishery exceeding its bycatch quota. Through collection of fishery dependent data within this area since its implementation, NMFS was able to determine that the hotspot no longer exists, even with the majority of vessels qualifying for access to the area. Since the area no longer has the same high rate of bluefin interactions, and bluefin tuna catch in the pelagic longline fishery since implementation of Amendment 7 is well below the amount of IBQ allocation available consistent with provisions in Amendment 7, NMFS determined its removal to be consistent with the objective of "continuing to minimize bycatch and bycatch mortality of bluefin" and to "optimize the ability of the fleet to harvest target species quotas."

NMFS disagrees that the current status of the western Atlantic bluefin stock is justification for not undertaking the actions proposed in this rule. The critically endangered listing referred to is under IUCN standards, which are not the same as domestic standards for listing a species as under the Endangered Species Act and generally do not drive decisions regarding needed management action under that Act or the Magnuson-Stevens Act. Bluefin tuna are not currently listed as threatened or endangered under the Endangered Species Act, which specifies criteria for listing a species as endangered or threatened. Domestic stock status is determined in accordance with stock status determination criteria established under the 2006 Consolidated HMS FMP consistent with the Magnuson-Stevens Act, based on the best scientific information available, which for western Atlantic bluefin tuna is the stock assessment conducted by the ICCAT SCRS. The western Atlantic bluefin stock is not experiencing overfishing. However, whether the stock is overfished remains unknown as of the last stock assessment (completed in 2017). ICCAT adopted a 20-year rebuilding program for western Atlantic bluefin in 1998. The rebuilding plan period was set as 1999 through 2018. In 2017, ICCAT adopted an interim conservation and management plan (ICCAT Recommendation 17-06) for western Atlantic BFT as an interim

measure to transition from the rebuilding program to a long-term management strategy for the stock. This interim plan included an annual Total Allowable Catch set for 2018 through 2020 while ICCAT develops a management strategy evaluation approach to future stock management. The management measures in this action respect the science-based quotas for the stock as well as the relevant subquotas established in Amendment 7 in 2015.

NMFS disagrees that the evaluation process does not allow for responsive action if needed. The evaluation period includes a threshold of combined bluefin catch and dead discards that, if exceeded, would result in NMFS closing the monitoring area for the remainder of the three-year evaluation period. Provided that the threshold is not exceeded during the three-year evaluation period, the area would remain open until NMFS decides to take additional action. Following the three-year evaluation period, NMFS will review data collected from the Monitoring Areas and compile a report. Based on the findings of the report, NMFS may then initiate a follow up action to implement new management measures for the area, if needed.

NMFS agrees that fisheries management should be based on the best science information available. As discussed in Chapter 9 of this FEIS, the preferred alternatives are consistent with National Standard 2 because they are based on the best scientific information available, including the latest stock assessments, scientific research, and up-to-date data sources. The data sources cited throughout the FEIS represent the best available science. Additionally, the preferred management actions in this rule are designed in full consideration of science-based quotas set by ICCAT for western Atlantic bluefin tuna and with the category subquotas established in Amendment 7. The IBQ Program was designed with specific provisions in place to prevent potential increases in bluefin catch in the Gulf of Mexico, which could occur if fishing effort was redistributed from the Atlantic to the Gulf of Mexico through either vessel or permit movement or purchase of IBQ allocation. The IBQ Program limits incidental catch of bluefin tuna in the pelagic longline fishery by putting limits on available IBQ allocation bluefin and puts the responsibility for compliance with the Program requirements on individual vessels. This action is expected to continue to limit bluefin tuna incidental catch to the levels previously established and implemented in Amendment 7. Furthermore, the preferred alternative for the Gulf of Mexico Gear Restricted Area includes a provision to adjust the threshold incorporated into the evaluation option in the event that the U.S. allocation of bluefin quota is adjusted via a future ICCAT Recommendation. The threshold described in the FEIS would limit the amount of Gulf of Mexico IBQ allocation (lb of quota) that could be used to account for bluefin landings and dead discards in the monitoring area. As described in Comment #11, if the ICCAT quota and U.S. allocation is decreased, then the threshold could become too large to be effective at minimizing bycatch and bycatch mortality of bluefin relative to the new ICCAT quota. This is a change between the DEIS and the FEIS in response to public comment to increase the threshold level commensurate with any future overall quota decrease and provides a conservative approach to re-opening areas. Preferred alternatives do not change regulations that prohibit directed fishing in the Gulf of Mexico and are consistent with ICCAT recommendation 17-06's prohibition of targeting bluefin tuna in the Gulf of Mexico.

Comment 2: NMFS received comments that the reduction in the number of active pelagic longline vessels and fishing effort began before gear restricted areas were implemented, and that the gear restricted areas were not the cause of such reduction.

Response 2: NMFS agrees that decreases in the number of active vessels and effort, landings, and revenue began prior to the implementation of the gear restricted areas under Amendment 7 in 2015. Table 1.1 in the FEIS (which shows data from 2012 through 2018) indicates that a decrease in estimated pelagic longline revenue and effort started prior to implementation of Amendment 7 despite efforts to revitalize the U.S. swordfish fishery for a number of years. Prior to initiation of this action, NMFS received suggestions from the public to consider the regulatory burden on the pelagic longline fleet and, at minimum, to evaluate whether current regulations are still needed to achieve management objectives. While the gear restricted areas may not be the sole factor influencing recent trends in the fleet, NMFS has received public comment noting that the collective regulatory burden may have had a role in decreasing the number of active vessels, effort, landings, and revenue of some target species (e.g., swordfish).

Comment 3: NMFS received comments that relieving regulations associated with the Gulf of Mexico Gear Restricted Areas, the Cape Hatteras Gear Restricted Area, and the Northeastern United States Closed Area will increase billfish, sea turtle, and other non-target species bycatch mortality to levels that are not sustainable. NMFS also received comments that all preferred alternatives in this rulemaking would lead to unsustainable harvest of billfish, which would adversely affect recreational fishing communities. Specifically, commenters stated that reopening the closed areas and implementing a seasonal weak hook requirement would result in higher numbers of billfish interactions from pelagic longline fishing activity that could in turn reduce numbers of billfish in these areas. Such reductions in billfish would adversely affect Atlantic HMS tournaments and the jobs created by the recreational fishing industry.

Response 3: NMFS disagrees that implementing the preferred alternatives would increase bycatch mortality in a manner inconsistent with stock assessments or inconsistent with the requirement that NMFS minimize bycatch and bycatch mortality to the extent practicable. In this FEIS, NMFS presented an impacts analysis in Chapter 4 that discusses potential effects of alternatives on restricted and protected species, such as marlin, spearfish, sailfish, shortfin mako, dusky shark, and sea turtles. Predicted total annual catch was, where possible, presented as a range of catch per unit effort in impact tables. NMFS also provided in these tables the annual catch from the applicable region for comparison to the No Action Alternative.

Regarding Preferred Alternative B2, ecological impacts to these species and sea turtles were anticipated to be neutral due to minimal change in fishing effort as a result of removing the Cape Hatteras Gear Restricted Area, as the majority of the fleet has recently had access to the area. The vessels denied access to this area in recent years had few to no interactions with restricted and protected species in the boundaries of the Cape Hatteras Gear Restricted Area (see discussion in *Ecological Impacts on Restricted or Protected Species*, Section 4.2.2). Under Preferred Alternative A4, the predicted total annual discards

of spearfish and dusky shark, and interactions with sea turtles, were less than predicted discards or interactions under the No Action Alternative. This suggests that the ecological impacts to spearfish, dusky shark, and sea turtles are anticipated to be more beneficial under the Preferred Alternative than under the No Action Alternative due to predicted redistribution away from areas with high CPUE. The predicted annual interactions of shortfin mako and discards of white and blue marlin, and sailfish, under the preferred alternative were calculated to be similar to the No Action Alternative, interactions or discards associated with the No Action Alternative fell within the range of predicted total annual interactions or discards that might occur under preferred Alternative A4, suggesting that the ecological impacts would also be similar for these species. Under Preferred Alternative C3, the predicted total annual interactions with shortfin mako and discards of dusky sharks was calculated to be less than the current annual interactions and discards of these species in open areas of the Gulf of Mexico. This suggests that the ecological impacts to shortfin mako and dusky shark are predicted to be more beneficial under Preferred Alternative C3 than the No Action Alternative, due to predicted redistribution away from areas with high CPUE. The predicted annual sea turtle interactions, and discards of blue and white marlin and sailfish, were similar between the No Action Alternative and Preferred Alternative C3, suggesting comparable ecological impacts across the two alternatives for these species.

NMFS disagrees that allowing pelagic longline vessels access to these areas would adversely affect fishing tournaments or reduce jobs associated with recreational fishing. Roundscale spearfish was the only species for which the predicted range of Gulf of Mexico discards under Preferred Alternative C3 exceeded the ongoing average levels (i.e., the No Action Alternative). Given the results of these analyses, which do not imply a large increase in the number of interactions with most billfish species, NMFS does not anticipate that implementing the preferred alternatives would adversely affect the billfish stocks in the Gulf of Mexico.

NMFS also disagrees that the preferred alternative to implement a seasonal weak hook requirement would adversely affect billfish populations in the Gulf of Mexico. As noted in Appendix B, research conducted by the NOAA SEFSC indicated that weak hook use did not have a statistically significant effect on CPUE of Atlantic sailfish or blue marlin. However, a statistically significant increase in CPUE of white marlin and roundscale spearfish was associated with weak hook use. Because catch per unit effort of these species increases in the second half of the year, the implementation of Preferred Alternative D2 is anticipated to have a positive impact on these stocks.

NMFS would continue to monitor bycatch of roundscale spearfish and other species during the evaluation period included in Preferred Alternatives C3 and A4, and compile results in a report generated from data collected during the evaluation period. The evaluation report may include, but not be limited to, target species landings and effort, bluefin catch rates, IBQ debt from vessels fishing in the area, percentage of IBQ allocation usage, compliance with other pelagic longline regulations, enforceability concerns, and amount of bycatch of restricted or protected species. Based on the findings of the report, NMFS may initiate a follow up action to implement new management measures for the area if necessary. As

part of this evaluation, NMFS could compare these data to other data collected by the agency, such as tournament reporting, to determine whether a change in the number of landed billfish occurred during the evaluation period. The preferred alternatives provide opportunities to monitor bycatch and bycatch mortality of numerous species in the Gulf of Mexico, and would not commit the agency to an action that would remove these protected areas from the regulations. Reopening the gear restricted area to fishing could provide more flexibility for fishermen to move away from areas with higher bycatch to areas with lower bycatch. By establishing the three-year evaluation period for the monitoring area before considering removal of gear restrictions for the longer term, NMFS is balancing the objective of "minimizing bycatch and bycatch mortality of bluefin and other Atlantic HMS" with the other two objectives of this rulemaking.

Comment 4: NMFS received comments that suggested modifying regulations associated with the Spring Gulf of Mexico Gear Restricted Area, the Cape Hatteras Gear Restricted Area, and the Northeastern United States Closed Areas could negatively impact Atlantic HMS EFH and critical habitat identified under the ESA for loggerhead sea turtles. These commenters suggested that opening gear restricted or closed areas that overlap with EFH and critical habitat designations is not consistent with objectives of minimizing bycatch or bycatch mortality of these species.

Response 4: NMFS agrees that the Spring Gulf of Mexico Gear Restricted Area, the Cape Hatteras Gear Restricted Area, and the Northeastern United States Closed Area do overlap with critical habitat and EFH designations for Atlantic HMS and other species. However, NMFS disagrees that opening closed or restricted areas that overlap with loggerhead sea turtle critical habitat (79 FR 39855; August 11, 2014) or EFH is inconsistent with objectives to minimize bycatch and bycatch mortality of these species. Since NMFS is not changing any bluefin tuna or other quotas with this rulemaking, the likely effect of this rulemaking would be redistribution of fishing effort back into areas previously closed (but not a significant overall increase in effort). Some of this redistribution will occur from areas that have been designated as EFH and/or critical habitat. NMFS is currently undergoing reinitated consultation over the effects of the pelagic longline fishery on ESA-listed species and habitat under the ESA, which is anticipated to result in an updated BiOp in 2020. The HMS Management Division will continue to coordinate with the NMFS Office of Protected Resources during the consultation and implementation on a new BiOp, which will include consideration of the impacts of fishing activities on listed species. Atlantic HMS EFH is not designated in a way that can distinguish the value of habitats in specific locations or across multiple scales (i.e., it is based on Level 1 or presence/absence data); there is therefore no basis to determine that redistribution from one location designated as EFH to another location designated as EFH would have an adverse or beneficial ecological impact.

Based on the analysis presented in Amendment 10 to the 2006 Consolidated Atlantic HMS FMP, most HMS gears fished in upper water column were determined to not have adverse effects on Atlantic HMS EFH or the EFH of other pelagic species. The importance of these habitats is based more on the combination of oceanic factors such as current influences, temperature edges, and surface structure. As discussed in Chapter 4 of the FEIS for this rule, NMFS has not identified new information that would supplant the conclusions of

Amendment 10. The closed and gear restricted areas considered in this rulemaking do not in themselves provide protection for a specific type of habitat. Rather, the Northeastern United States Closed Area was implemented in response to a 1996 ICCAT recommendation that the United States reduce BFT discards. NMFS used pelagic longline logbook data collected between 1992 and 1997 to select a preferred alternative for the Northeastern United States Closed Area. Gulf of Mexico and Cape Hatteras Gear Restricted Areas were designed using HMS logbook geographically referenced set data from 2006 - 2012 to identify areas with relatively high bluefin interaction rates with pelagic longline gear (see pg 29 of the Amendment 7 FEIS). Given that the data used to implement these areas are dated, and that environmental conditions and distribution of fish may change, having an opportunity to collect new fishery-dependent data in these areas may assist with future evaluations of fishing impacts on EFH. The end of the three-year evaluation period in the preferred alternatives coincides with the timing of the next Atlantic EFH 5-Year Review, which provides an opportunity for both management initiatives to be considered concurrently.

Comment 5: NMFS received comments that any increased bluefin tuna landings from the pelagic longline fishery that result from having access to previously closed areas or gear restricted areas will negatively impact market prices of bluefin caught in directed fisheries.

Response 5: Increased landings of bluefin tuna can have localized impacts on market prices if the landings are concentrated geographically and increase dramatically over a short period of time. However, the pelagic longline fleet only lands approximately 8.7% (88.1 metric tons) of total Atlantic landings of 1012.2 metric tons (based on 2018 data). Often the global market for bluefin tuna has a more direct impact on the market prices for bluefin caught by the US Atlantic directed fisheries than any change in US Atlantic bluefin tuna incidental landings[6].

Comment 6: NMFS received comments that relieving restrictions on the pelagic longline fleet could result in, and/or encourage, the pelagic longline fishery targeting bluefin, and this should be avoided. Specifically, commenters expressed that allowing pelagic longline fishing in the Gear Restricted Area was comparable to allowing targeted fishing on Gulf of Mexico spawning bluefin, and that allowing pelagic longline vessels to retain spawning bluefin caught in the Gulf of Mexico has unintentionally resulted in a *de facto* "incidental" catch fishery for bluefin in this area in violation of ICCAT mandated measures.

Response 6: NMFS agrees that pelagic longline vessels are prohibited from targeting bluefin tuna and reiterates that current management measures are structured as such (see, e.g., Amendment 7). NMFS has managed the pelagic longline fishery as an incidental category for bluefin for many years and has implemented a number of regulations to discourage interactions with bluefin and limit the bluefin that can be retained or discarded.

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[6] Sun C-H, Chiang F-S, Squires D, Rogers A, Jan M-S (2019) More landings for higher profit? Inverse demand analysis of the bluefin tuna auction price in Japan and economic incentives in global bluefin tuna fisheries management. PLoS ONE 14(8): e0221147. https://doi.org/10.1371/journal.pone.0221147

Furthermore, ICCAT recommendations including the current management measure (Rec. 17-06) specify that there "shall be no directed fishery on the bluefin tuna spawning stock in the western Atlantic spawning grounds (i.e., the Gulf of Mexico)."

NMFS disagrees that implementing the preferred alternatives would result in targeting of bluefin tuna by pelagic longline vessels. The Longline quota category is an incidental category for bluefin tuna used to account for known bycatch in the pelagic longline fishery during directed fishing operations for other species. Specifically, bluefin tuna are caught as bycatch in pelagic longline fisheries that target swordfish and yellowfin tuna, and any mortality of that bycatch (retained or discarded dead) is subject to being accounted for via IBQ allocation. Longline category permit holders who qualified for IBQ shares through the process established in Amendment 7 annually receive a limited IBQ allocation, which they are required to use to account for incidentally caught bluefin tuna. Active vessels not associated with IBQ shares must lease IBQ allocation to depart on a trip with pelagic longline gear and must account for all bluefin bycatch during targeted fishing for other species. In limited circumstances (i.e., when available and following consideration of regulatory determination criteria provided under § 635.27(a)(8)), NMFS has distributed allocation directly to active vessels, where available, to facilitate fishing for target species.

Amendment 7 provided an amount of bluefin quota to the pelagic longline fishery that reduces dead discards yet accounts for a reasonable amount of incidental catch that can be anticipated and will enable the continued generation of revenue associated with the pelagic longline fishery's target catch while limiting allowable bluefin incidental catch. Implementation of the preferred alternatives would not change the amount of regionally specific pelagic longline IBQ allocation, i.e., that is designated as either "Atlantic" or "Gulf of Mexico; it would only change where fishing could occur within these regions. Atlantic Tunas Longline category permit holders would continue to be required to use IBQ allocation to account for incidental catch of bluefin tuna during directed fishery operations. When actively fishing, vessel operators are encouraged to modify their fishing behavior to minimize bluefin tuna interactions and therefore ensure that catch does not exceed the available IBQ allocation to cover the vessel's incidental catch of bluefin. Any exceedances must be accounted for via a lease of IBQ allocation (and may incur financial and logistical costs) to account for this catch, or the owner/operator risk limiting their ability to continue to participate in the fishery if outstanding quota debt is not resolved. Quota debt must be repaid on a quarterly basis or continued fishing would be prohibited. Overall limits are placed on available IBQ allocation consistent with the measures adopted in Amendment 7, and this action does not change the provisions on IBQ allocation availability.

NMFS disagrees that allowing pelagic longline vessels to retain bluefin tuna caught in sets made within the boundaries of the Gulf of Mexico Gear Restricted Area incentivizes directed fishing on bluefin tuna. Any interactions with PLL are incidental to other directed fishing and regulations have been designed to discourage any such interactions and to minimize bycatch to the extent practicable. In accordance with ICCAT recommendation 17-06, there shall be no directed fishery on the bluefin tuna spawning stock in spawning grounds such as the Gulf of Mexico. As such, the amount of quota provided to Gulf of Mexico vessels would be unchanged under the preferred alternative; it would only alter where fishing in

the Gulf of Mexico would be allowed to occur. The boundaries of the Gulf of Mexico Gear Restricted Area were delineated based on increased catch rates of bluefin tuna in the area relative to other areas in the Gulf of Mexico during the years of analysis for Amendment 7, not based on reports of targeted fishing.

NMFS disagrees that allowing retention of incidentally-caught bluefin in the Gulf of Mexico is in violation of ICCAT recommendations. The ICCAT recommendation, implemented as necessary and appropriate through regulations under ATCA, specifies that there is to be no directed fishery on the spawning stock. It does not prohibit retention of incidentally-caught bluefin tuna in the Gulf of Mexico during directed fishing operations for other species. Through the limitations in place (i.e., weak hooks, GOM IBQ allocation limits, electronic monitoring), the regulations appropriately limit the pelagic longline fleet to an incidental fishery.

Comment 7: NMFS received comments that the DEIS mentions the removal of measures that could reduce redundancies in regulations without identifying or enumerating the alleged redundancies. Some commenters agreed that some or all of the management measures are redundant with other regulations such as the IBQ Program, while other commenters disagreed that these measures were redundant with the IBQ Program.

Response 7: The DEIS and Proposed Rule clearly articulated the regulations it was considering to be potentially redundant in effect with regard to limiting incidental catch of bluefin tuna in the pelagic longline fishery. These include regulations for the Northeastern United States Gear Restricted Area, the Cape Hatteras Gear Restricted Area, the Spring Gulf of Mexico Gear Restricted Area, and the current year-round weak hook requirements. The proposed rule clearly described the proposed management measures, and NMFS facilitated communication with the public via the internet and its website and through public hearings and Atlantic HMS Advisory Panel meetings.

Each of these regulations has similar objectives related to limiting and managing bluefin tuna incidental catch in the pelagic longline fishery. Through this rulemaking, NMFS is reviewing whether all of these measures implemented are still needed to appropriately limit incidental bluefin tuna catch, given the success of the IBQ Program, and, if not, whether leaving them all in place is unnecessarily restrictive of the pelagic longline fishery. This review was undertaken, we explained in the Proposed Rule and DEIS, because significant regulatory action overhauled management of bluefin tuna several years ago, and it appears that not all of the measures in place remain needed to accomplish the management objectives of that rulemaking. To address, limit, and account for bluefin tuna incidental catch in the pelagic longline fishery, Amendment 7 modified the distribution of quota among categories, implemented the IBQ allocation program and electronic monitoring of every pelagic longline set, established regional limits on bluefin incidental catch—including in the Gulf of Mexico which provided additional protections for spawning bluefin tuna--and implemented gear restricted areas. This was in addition to other measures already in place (e.g., closed areas, weak hooks). Adopted in 2015, these measures were developed respecting science-based quotas and also making difficult management decisions regarding the need to balance multiple objectives, including limiting

the pelagic longline fishery to incidental bluefin catch, the requirement to minimize bycatch and bycatch mortality to the extent practicable, and the requirement to provide vessels a reasonable opportunity to catch available quotas (i.e., swordfish).

Several years later, participation in the pelagic longline fishery has continued to decline, available quota for target species remains unharvested (e.g., swordfish), and available IBQ allocation within the limits set in the 2015 action goes unused. Given these factors and public feedback starting at the scoping stage, not all of the measures in place remain needed or useful in appropriately limiting incidental catch of bluefin tuna in the pelagic longline fishery consistent with the approach first established in Amendment 7. Through this rulemaking, NMFS also considers whether there are ecological benefits that warrant retaining management measures with similar objectives.

This rule analyzes multiple regulations in effect that are intended to reduce bluefin tuna bycatch, interactions, and/or discards. Specifically, NMFS has posed the question of whether weak hooks and gear restricted area measures are still needed in concert with the IBQ Program to meet overall management objectives of reducing bluefin interactions or dead discards. In some cases, due to the ecological benefits, there may be value in maintaining regulations that may be redundant in effect. For example, the SEFSC noted a statistically significant decrease in bluefin CPUE by 46 percent and a statistically significant increase in white marlin and roundscale spearfish catch-per-unit effort by 46 percent associated with weak hooks deployment. NMFS has therefore preferred an alternative that would retain the weak hook requirement when bluefin tuna are present in the Gulf of Mexico and mitigate the negative effects of the weak hook requirement on white marlin and roundscale spearfish by removing the requirement from July through December. Therefore, even though weak hooks and the IBQ Program were implemented to do similar things, the need and ecological benefit of weak hooks for bluefin remains when it is most effective and NMFS has determined that the preferred alternative strikes the best balance between multiple rulemaking objectives.

Because the IBQ Program and the Spring Gulf of Mexico Gear Restricted Areas were implemented at the same time, we acknowledge it is challenging to separate out the impacts of the individual management measures. Data collection from this area during a Monitoring Area period would allow NMFS to isolate the impacts of implementing both the gear restricted areas and the IBQ Program versus just implementing the IBQ Program. Should the gear restricted areas be considered necessary to achieving management objectives, NMFS could consider retaining them in a future rulemaking despite the similar goals for the gear restricted areas and the IBQ Program. NMFS has addressed similar concerns regarding the Northeastern United States Closed Area, the Cape Hatteras Gear Restricted Area, and weak hook implementation in relevant sections of this Response to Comments.

Comment 8: NMFS received comments in support of and in opposition to modifying the spatial extent of the Spring Gulf of Mexico Gear Restricted Area and the Northeastern

United States Closed Area. Specifically, commenters suggested that NMFS create a large box that contains both areas comprising the Spring Gulf of Mexico Gear Restricted Area, and expand the Northeastern United States Closed Area northeastward to encompass an area south of Georges Bank along the continental shelf that includes areas with higher bluefin interactions (e.g., see dark blue cells southeast of Cape Cod in Figure 3.11). NMFS received comments expressing concern that pelagic longline fishery participants have fished around the edges of the closure for years, particularly to the east of the Northeastern United States Closed Area, and that reopening the area could result in high bluefin tuna bycatch, including "disaster sets."

Response 8: NMFS disagrees that it is appropriate to expand existing gear restricted areas to cover adjacent areas where pelagic longline interactions with bluefin occur. While such an expansion would be consistent with objectives to *"minimize bycatch and bycatch mortality of bluefin."* expanding these areas to include additional productive fishing grounds in these regions is not consistent with the objective to *"optimize the ability for the pelagic longline fleet to harvest target species quotas."* Although some fishing activity did occur along the northeastern corner of the Northeastern United States Closed Area in 2015-2016, and was included in analyses for the FEIS alternatives, the implementation of the National Monument has shifted fishing effort out of this area due to lack of space in which to deploy gear between the boundaries of the two closures. NMFS acknowledges that there is uncertainty associated with reopening the Northeastern United States Closed Area due to the amount of time that has passed since fishery dependent data has been collected in this area during the month of June. For this reason, instead of selecting an alternative that would reopen the area immediately, NMFS has preferred an alternative that would allow for fishery-dependent data collection provided that bluefin landings and dead discards do not exceed a specified threshold. Because these suggestions do not represent a reasonable balance between the three rulemaking objectives, NMFS has not included them for further consideration in the FEIS.

Comment 9: NMFS received comments on the evaluation of spatially managed areas (i.e., Preferred Alternatives A4 and C3). Some commenters felt that review processes for spatially managed areas are important and should be included in the implementing design for any closed area to understand the effectiveness/level of impact of the areas and to gather data. Other commenters felt that the review process should also include consideration of whether the size and shape of the closed area should be adjusted. Many commenters were opposed to Preferred Alternative A4 and Preferred Alternative C3 because they felt that the design of the evaluation period in the preferred alternatives is unscientific. NMFS received comments that the agency should only explore data collection from gear restricted or closed areas through a separate initiative on how to collect data in support of area-based fishery management and not make any decisions about opening any areas to fishing until after such data collection and evaluation processes that come from that initiative are implemented. NMFS also received suggestions to research the location and variability of bluefin tuna preferred habitat (temperature, chlorophyll, depth, etc.), and use electronic tagging data to check incidence of bluefin in the proposed closed areas. Some commenters felt that NMFS should incorporate the implementation of target catch requirements (previously removed in Amendment 7) in the evaluation process of Preferred

Alternatives A4 and C3 to ensure that pelagic longline vessels do not target bluefin in sensitive areas.

Response 9: NMFS agrees that it is important to undertake periodic evaluations of management measures to ensure that they meet FMP objectives. In particular, NMFS agrees that review processes for spatially managed areas that impose restrictions or closures in space or time are important, because distribution of fishing effort, managed species, or environmental conditions upon which Atlantic HMS are dependent may change with time. NMFS acknowledges that modifications to the spatial extent of the area may be included as a future management option for these areas if the outcomes of the evaluation process indicates that such an idea warrants further consideration. As part of the preferred alternative, NMFS would compile data for an evaluation report that may include, but not be limited to, target species landings and effort, bluefin catch rates, IBQ debt from vessels fishing in the area, percentage of IBQ allocation usage, compliance with other pelagic longline regulations, enforceability concerns, and amount of bycatch with restricted or protected species. NMFS will use data from this report to consider additional next steps for the Spring Gulf of Mexico Gear Restricted Area and the Northeastern United States Closed Area, which may include a consideration of the size and shape of the area in addition to options such as reinstating the areas, removing the areas from the regulations, or some form of provisional access. NMFS chose to include bluefin tuna fisheries management measures in this rulemaking that were originally implemented with similar objectives; namely, to minimize bluefin tuna interactions or dead discards with pelagic longline gear. NMFS is undertaking a separate initiative which considers data collection and research in closed areas to consider other time area closures implemented for different species or different reasons. The initiative on HMS spatial management data collection and research will consider spatial management measures for all HMS. Any rulemaking for that initiative would be able to consider outcomes from the final rule associated with this FEIS.

NMFS disagrees that the preferred alternatives are unscientific, as they have been developed to work within science-based quotas for target and bycatch species, and with the intent of collecting fishery dependent data upon which to base ongoing and future management measures in accordance with the monitoring protocols established by this action.

NMFS disagrees that target catch requirements should be re-instituted and included in the evaluation process to prevent targeting of bluefin in sensitive areas. The pelagic longline fishery in the United States does not target bluefin tuna; rather, it targets swordfish and yellowfin tuna and catches bluefin tuna incidentally. Regulations minimize bycatch and bycatch mortality of bluefin tuna in the fishery and limit it to an incidental fishery through the IBQ Program, and the use of available fishery data including VMS set reporting and real-time monitoring via EM to ensure that targeted fishing of bluefin is not occurring. Prior to Amendment 7, target catch requirements were used to limit retention of bluefin tuna incidentally caught during directed fishing operations for other HMS species. As discussed in Amendment 7, however, this sometimes led to wasteful discards of bluefin tuna if the amount of target species catch was insufficient to retain the numbers of bluefin caught. Vessels that caught some bluefin but had insufficient target species to meet the target catch

requirement would not have to choose between discarding bluefin or fishing for more target species; rather the vessel would use the annual IBQ allocation. The IBQ Program replaced the target catch requirement as the means of limiting the amount of bluefin landed and discarded dead per vessel on an annual basis, instead of on a per trip basis. The Amendment 7 management measures, inclusive of the IBQ Program and removal of target catch requirements, have had a substantial effect on the number of dead discards occurring in the pelagic longline fishery. As noted in the Three-Year Review of the IBQ Program, the average amount of dead discards in the pelagic longline fishery was 89 percent less after (2015-2017) implementation of the IBQ Program than in the three years immediately prior to implementation (2012-2014). Reinstating the target catch requirements, while also maintaining the IBQ System as a means of limiting the amount of bluefin landed and discarded dead, is unnecessarily restrictive on pelagic longline fishery effort and not consistent with the objective to "simplify and streamline Atlantic HMS management, to the extent practicable, by reducing redundancies in regulations".

Comment 10: NMFS received comments suggesting that there was a significant role for government observers in the design or implementation of Northeastern United States and Spring Gulf of Mexico Monitoring Areas, or in making changes to the Cape Hatteras Gear Restricted Area. For example, some commenters felt that only data collected by an official government observer should be used in designing evaluative options to ensure that there is no bias. Others felt that the monitoring area would only be effective if an official government observer (not contracted commercial fishing industry observer or technician) is on board to ensure no bias.

Response 10: NMFS agrees that the observer program provides important scientific data for management and science-based stock assessments. NMFS has available a variety of sources of commercial fisheries data to inform management decisions. While extremely useful in estimating dead discards and providing other information, the observer program is not a complete census of the fishery, and the extent of observer coverage is not necessarily useful in all cases in assessing ecological or economic effects of time/area closures, especially on a very fine scale. Furthermore, there is a small percentage of vessels that have not been observed. In addition to observer data, there are other fishery-dependent data streams that NMFS finds acceptable for use in these monitoring areas and their evaluation including the HMS logbook, EM, and IBQ reporting. NMFS disagrees that the presence of observers should be a condition for entry into the Northeastern United States Monitoring Area or the Gulf of Mexico Monitoring Area. NMFS believes that the current data streams, including but not limited to the observer program, provide sufficient mechanisms to crosscheck data validity and ensure compliance.

However, NMFS disagrees with the commenter that only observer data should have been used in the design and analysis of the evaluation process in the DEIS and FEIS, or in making management decisions about the Cape Hatteras Gear Restricted Area. NMFS would consider all available sources of fishery data, including observer program data, collected between 2020 and 2022 when finalizing the report generated as part of the evaluation process described under Preferred Alternatives A4 and C3. NMFS considered multiple data sources in the development of the DEIS and FEIS. This action focuses on area-based

measures, whether related to fishing vessel access or gear requirements. Given that the action addresses discrete geographical area designations and gear configuration within certain areas, rather than, for example, the amount of allowable catch for a stock or estimates of stock abundance for a stock assessment, the most relevant data sources for this action are fishery-dependent data that reflect the needed geographic and other data for the area-based analyses. Atlantic HMS Logbook Data is required, self-reported data that includes landings, discards, gear, location, and other set and trip information. All pelagic longline fishermen with Atlantic HMS permits are required to use this logbook. Because the need for action focuses on the HMS pelagic longline fishery, because all HMS pelagic longline fishermen are required to report in this logbook, because the data can be cross-validated with other data sources, and because the data provides location and other fishing variables required for the various analyses, NMFS used the HMS logbook as the primary data source for the analysis of ecological and socioeconomic impacts on preferred alternatives for the Cape Hatteras Gear Restricted Area, the Northeastern United States Closed Area, and the Spring Gulf of Mexico Gear Restricted Area in this rulemaking. NMFS also used some Atlantic HMS electronic dealer data for the socioeconomic calculations.

Comment 11: NMFS received comments in support of and in opposition to incorporating thresholds into the evaluation process included under Preferred Alternatives A4 and C3. Commenters in support of the threshold (particularly for the Northeastern United States Monitoring Area) expressed concern that the threshold would be met quickly, triggering a closure. These commenters questioned whether NMFS would disburse additional IBQ allocation via an inseason quota transfer if that occurs. NMFS also received suggestions that a threshold in the evaluation process was not necessary, as the evaluation process itself was too complex for a rulemaking with an objective focused on simplifying or streamlining regulations, and would result in micromanagement. NMFS also received comments with suggested modifications to the threshold, including the use of a percentage of the available Gulf IBQ allocation instead of setting a hard poundage limit for a threshold in the Gulf of Mexico Monitoring Area. Regarding thresholds established for the Northeastern United States Monitoring Area, the 150,519-pound threshold for June in just the Northeastern area is equivalent to 68 mt. Since this is almost the entire longline catch for all months and all areas of 2018 (88.1 mt), commenters questioned whether such a threshold is limiting as part of an "evaluation" program.

Response 11: NMFS disagrees that the threshold for the Northeastern United States Monitoring Area would be met quickly. The analysis of Preferred Alternative A4 predicts that between 14 and 68 bluefin would be retained per year from the Northeastern United States Monitoring Area and adjacent reference area as a result of implementing this alternative. If all of these fish were harvested from sets made within the Northeastern United States Monitoring Area, based on the average weight of an Atlantic region landed bluefin (275 lb), the amount of IBQ allocation used to account for these landed fish would be between 3,850 lb and 18,700 lb per year. Under the No Action Alternative, 48 bluefin are estimated to be retained per year. Using the same calculation, the amount of IBQ allocation used to account for landed fish in this region under the No Action Alternative is estimated to be around 13,200 lb. NMFS therefore predicts that a range of impacts could occur, which might result in a small increase in the number of landed bluefin (+ 20 fish per

year, based on the high end of the estimated range of fish kept) and the corresponding amount of IBQ allocation required to account for those fish (+5,500 lb IBQ allocation)(Table 4.9). This increase would not meet the threshold established in the preferred alternative and fishing could occur for the three-year evaluation period if the high range estimate were to occur. While the provisions on the evaluative period and opening the Northeastern United States Monitoring Area are new, the provisions in Amendment 7 regarding inseason quota transfers among categories remain the same as those adopted in 2015. The disbursement of inseason quota transfers to the Longline category depends on several factors and are listed at 50 CFR § 635.27(a)(8). NMFS would continue to evaluate any inseason quota transfers on a case by case basis consistent with Amendment 7 provisions.

NMFS acknowledges that the review process is complex with several steps involved, but disagrees that the threshold is not necessary. The threshold was designed to address uncertainties associated with allowing access back into areas that had previously been closed, and to ensure that steps taken by the agency to assess potential deregulation does not compromise management goals and objectives for the pelagic longline fishery. Specifically, Preferred Alternatives A4 and C3 include a mechanism to collect fishery dependent data from the entire Northeastern United States Closed Area, monitor the fishing practices and close the area if excessive incidental catch of bluefin tuna during directed fishing occurs, and formulate a report of data collected to determine the best management decision for the area based on current data. NMFS agrees that there are situations where it makes sense to codify a percentage instead of a hard number into the regulations for the thresholds identified for the evaluation process under Preferred Alternative C3 and A4. The 63,150 lb IBQ allocation threshold for Alternative C3 (Spring Gulf of Mexico Monitoring Area) and the 150,519 lb IBQ allocation threshold for the Northeastern United States Monitoring Area are respectively equivalent to 55 percent of the total Gulf of Mexico IBQ annual allocation and 72 percent of the total Atlantic IBQ annual allocation issued to the fleet in 2018. NMFS has modified these Preferred Alternatives to adjust the threshold to a comparable percentage of Gulf of Mexico IBQ (i.e., 55 percent) and Atlantic IBQ (i.e., 72 percent) in the event that ICCAT reduces the U.S. allocation of bluefin quota. Although NMFS acknowledges that the threshold is large for the Northeastern United States Monitoring Area, it is less than the entire Longline category quota. NMFS based the threshold for the Northeastern United States Monitoring Area on the recent average amount of available quota on June 1 because fishing is happening in multiple locations along the east coast at this time of year. While it is true that this threshold is equivalent to a large proportion of the bluefin catch (landings and dead discards), NMFS designed the threshold is to ensure that opening the area to fishing would not compromise the ability of fishery participants to obtain enough IBQ allocation to account for Atlantic-wide bluefin landings and dead discards for the rest of the year. This threshold will allow for data collection to continue for the three-year period and continue to manage incidental catch of bluefin tuna in the pelagic longline fishery consistent with the Longline category subquota, the limits established for use of IBQ allocation in the Atlantic and Gulf of Mexico regions, and with the science- based overall quotas.

Comment 12: NMFS received comments that generally supported deregulation. Specifically, these comments expressed that the IBQ Program is an output control, and that input

controls are not needed as much when the output control is effective. Other comments expressed that removing spatial restrictions would enhance the ability of the fleet to avoid bycatch, as closures hinder the ability to move away from a problem area and locate elsewhere. These comments also noted that in order for the IBQ Program to work well, fishermen need access to enough productive fishing grounds in order to make choices about location based on bluefin interactions of the fleet. If they don't have good alternatives to fish in, they will be forced to fish in riskier areas. Some commenters felt that fishermen have better tools and information (e.g., rapid access to environmental data to make informed decisions on fishing locations), and increased capabilities to avoid bluefin. Fishermen can therefore be precautionary in selecting where to fish.

Response 12: NMFS agrees that it is appropriate to evaluate through this FEIS and associated rulemaking whether certain regulations are necessary to meet management objectives. Under the IBQ Program, fishermen are incentivized to minimize incidental catch of bluefin tuna in the pelagic longline fishery directing on other Atlantic HMS direct accountability for such incidental catch and associated costs and risks if it exceeded (e.g., the cost to lease additional IBQ allocation, risk of not fishing in a quarter if quota debt is not resolved). NMFS also agrees that fishermen have tools to make informed decisions in advance of trips to select fishing locations that optimize target catch and minimize bluefin bycatch, such as the availability of free or commercially available environmental or satellite data and communication with other members of the fleet. While outright removal of spatially managed areas would provide the most flexibility concerning site selection for commercial fishermen, NMFS has preferred two alternatives that would implement an evaluation period to collect fishery-dependent data before such areas would be removed. NMFS believes this provides a more precautionary approach and a better balance of rulemaking objectives than removing the areas immediately without an evaluative period.

Comment 13: NMFS received comments that the Secretary of Commerce recently called for action in removing unnecessary restrictions on U.S. fishermen which contributes to the United States reliance on imported seafood to meet consumer demand.

Response 13: This rulemaking is considered to be deregulatory in nature, and would either remove restrictions, or provide a mechanism to evaluate whether the management measures are still needed to meet management objectives. The latter would provide information to support a future potential rulemaking that could modify or remove restrictions on U.S. commercial fishermen.

Comment 14: NMFS received comments requesting geographically referenced catch and effort data in the form of "shot charts" be included in the FEIS.

Response 14: In order to be responsive to the request for information, NMFS has provided the requested shot charts in Appendix D of the FEIS. "Shot charts", as referenced by the commenters, are based on a graphic tool initially popularized by Kirk Goldsberry for depicting basketball statistics. Spatial data are joined to a hexagon grid, which removes clustering and allows for easier pattern visualization. Unlike other maps produced by NMFS, shotcharts contain a bivariate display that allows a single symbol to convey two

pieces of information. For example, colors might be used to confer rate information while size indicates frequency. Constituents request that NMFS include higher resolution "shot charts" for bluefin, yellowfin and swordfish in the areas surrounding the Northeast Closure and the Spring Gulf of Mexico Gear Restricted Area in the FEIS. Although the shot charts provide a new way to visualize information, catch and effort data was presented in the DEIS in the form of tables, figures, and maps depicting single variables on 10' x 10' grid cells. The administrative burden to create a shot chart is significantly higher than other data maps included in the DEIS and this FEIS (4 hours versus a half hour), therefore NMFS has retained current data mapping protocols and analyses in addition to including shot charts as an appendix. NMFS will continue to evaluate the best tool to depict data in the future on an as-needed basis. No new or different information from that analyzed in the DEIS and proposed rule is presented. The new charts are only a new visual presentation of the earlier data.

Comment 15: NMFS received comments suggesting that the proposed rule is not aligned with National Standard 9, which requires NMFS to *"avoid or minimize bycatch" and "minimize the mortality of bycatch which cannot be avoided." 16 U.S.C. § 1851(a)(9).* NMFS also received comments that this rule is not aligned with § 1853(a)(11), which requires all FMPs to contain measures to minimize bycatch and bycatch mortality, because it does not propose that bycatch be avoided or reduced.

Response 15: NMFS disagrees that the proposed rule is not consistent with National Standard 9. NMFS analyzed consistency with the National Standards in Chapter 9 of the FEIS. Additionally, this rulemaking and EIS includes as an objective the need to *"continue to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear consistent with conservation and management objectives…"*. NMFS evaluated and selected preferred alternatives that best meet and/or balance the rulemaking objectives. As an example, NMFS has chosen to retain a seasonal weak hook requirement in the Gulf of Mexico under Preferred Alternative D2 as a tool to continue to minimize bycatch and bycatch mortality of both bluefin tuna and white marlin. Furthermore, although the preferred alternatives A4 and C3 would allow the pelagic longline fleet access to previously closed areas, there would still be measures in place to incentivize individual accountability for bluefin tuna avoidance (accountability requirements, regional IBQ designations, minimum IBQ allocation requirements, enhanced monitoring and reporting) and to provide a safety precaution against uncertainty (thresholds) in the monitoring areas. If the thresholds are not met, then pelagic longline fishing would continue to occur in the monitoring areas and NMFS would not remove the areas from the regulations without an evaluation and subsequent action, at which point the agency could decide on a number of potential next steps as necessary (e.g., retaining the closure, removing the closure, applying another monitoring period, applying performance metrics for access). This evaluation would review new fishery-dependent data collected on bluefin tuna and other bycatch that would inform future decisions. Furthermore, the requirement that bycatch be minimized to the extent practicable does not require the agency to reduce bycatch to zero with every fishery action, as to do so would not be practicable, given other fishery objectives and requirements.

Northeastern United States Closed Area

Comment 16: NMFS received comments in favor of and in opposition to making any changes to the Northeastern United States Closed Area under the preferred alternative. Comments in favor of the preferred alternative noted that the evaluation process provides a reasonable level of precaution to ensure that pelagic longline fleet-wide bluefin tuna mortality is appropriately managed. Comments in opposition noted that the existing closed area regulations have been effective in managing the bluefin tuna fishery and reducing bluefin tuna dead discards and have effectively created a conservation area. NMFS received comments that this area overlaps with the migratory pathway for bluefin headed north to forage in the Gulf of Maine, and that bluefin tuna are vulnerable to high catches by the pelagic longline fleet in the area encompassed by the Northeastern United States Closed Area, i.e., the area is still a "hot spot."

Response 16: NMFS agrees that the evaluation process undertaken in the Monitoring Area established under Preferred Alternative A4 provides an opportunity to collect information about the area and determine what future management action would be appropriate for the Northeastern United States Closed Area. After the three-year evaluation period, NMFS would analyze this data collected and compile an evaluation report. This report would be used to inform any necessary management changes to the Northeastern United States Closed Area. The processes established in Preferred Alternative A4 could include a number of options for NMFS action after the evaluation period.

NMFS acknowledges that there is considerable uncertainty concerning the Northeastern United States Closed Area. Since this area closure was implemented, fishery-dependent data have not been collected from the area in over 20 years. While this area may provide a conservation benefit for bluefin tuna as they migrate northward, changes in both the ocean environment and pelagic longline fishery have occurred since 1999 making it difficult to ascertain both its value as a conservation area and as a location where bluefin are vulnerable to high catches by the pelagic longline fleet in that area. The preferred alternative in the FEIS will provide a way to collect fishery dependent data from the area under close monitoring and evaluation. The preferred alternative includes a threshold of allowable bluefin catch (landings and dead discards) for the area during the month of June. If mortality exceeds this threshold, NMFS would re-close the area. Data collection is essential in order to determine if this area is still necessary for the management of the Atlantic pelagic longline fishery.

Comment 17: NMFS received comments suggesting we change the shape of the Northeast United States Closed Area by removing the western area as considered in Alternative A2 and potentially shift the area eastward to include certain canyon areas to account for areas of higher CPUE. The commenter notes that this would free up western portions of the closure that historically had low pelagic longline bluefin tuna interactions.

Response 17: NMFS disagrees that shifting the Northeastern United States Closed Area eastward would result in additional protections beyond those currently available to bluefin tuna. Much of the area to the east of the Northeastern United States Closed Area is now

part of the Northeast Canyon and Seamount Marine National Monument as shown in Figure 3.4 of the FEIS. This area prohibits commercial fishing operations, including pelagic longlining, thus the area immediately east of the Northeastern United States Closed Area is effectively closed to the pelagic longline fishery.

NMFS did consider opening the western portion of the Northeastern United States Closed Area (Alternative A2) based on historically low catches from that area in 1996 and 1997. NMFS did not prefer this alternative in the DEIS or the FEIS because this area also had historically low catch rates of target species and little effort, making this alternative less aligned than others with the objective to "optimize the ability of the pelagic longline fleet to harvest target species quotas." While this alternative would allow for some data collection in western portions of the closure, the ecological and socio-economic benefits of this alternative for bluefin, target species, and protected or restricted species were anticipated to be neutral. NMFS therefore selected a preferred alternative (Alternative A4) that would collect data under close scrutiny from the entire closure in order to evaluate the entire spatial extent of the Northeastern United States Closed Area.

Comment 18: NMFS received comments in opposition to Alternative A2, stating it relies on outdated data that are irrelevant to current fishing practices and the ecosystem and that it would maintain a substantial part of the closure, which in their view is ineffective, inefficient, and redundant.

Response 18: NMFS agrees that this alternative does rely on some historical data for justification of where the Northeastern United States Closed Area should be opened and where it should remain closed. Current catch rates from a surrounding reference area, delineated by NMFS, were used to predict catch rates that would occur in the area that would be opened under Alternative A2. NMFS included this data in the analysis because it is the most recent fishery-dependent data collected in the area which can be used for management decisions.

NMFS has not preferred this alternative because it does not balance the objectives of this rulemaking as well as other alternatives. Retaining portions of the closure might coarsely address uncertainty associated with bluefin distribution through retaining portions of the closure where historically there were elevated fishery interactions, especially if bluefin distribution is presumed to not have changed since the early to mid-1990s. In this case, this alternative is aligned with the objective to *"minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS…"* When this area was open, the pelagic longline fleet largely fished for target species in areas that became the eastern portion of the closure. Retaining this area as a closure may, depending on the distribution and abundance of target species, not be consistent with the rulemaking objective to "optimize the ability of the pelagic longline fleet to harvest target species quotas." Given the uncertainty, NMFS believes that evaluating the entire closed area to determine if it is still needed to manage bluefin tuna bycatch in the pelagic longline fishery. Retaining a portion of the Northeastern United States Closed Area does not provide the same opportunity in this area to *"simplify and streamline HMS regulations...by reducing any redundancies in regulations established to reduce bluefin tuna interactions."*

Comment 19: NMFS received comments that NMFS should eliminate the Northeastern United States Closed Area (Alternative A5) as this closed area is an ineffective and inefficient input-control measure and is redundant with the far more effective and efficient output control IBQ management system now in place. It also is an important fishing area for pelagic longline vessels because of the continental shelf break and local current patterns, and may now be where longliners need to have access to fishing ground while avoiding bluefin tuna.

Response 19: NMFS disagrees that it is appropriate to eliminate the Northeastern United States Closed Area without an appropriate evaluative period, given the lack of data collected since implementation of the closure in1999. The lack of current data makes it difficult to determine if bycatch of bluefin tuna would be a problem in the Northeastern United States Closed Area. It is therefore difficult to determine the extent that this alternative can be aligned with objectives to *"minimize...bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS…".* This alternative does not provide NMFS the ability to restrict fishing if bycatch impacts to the bluefin tuna or other species are beyond acceptable levels. This alternative also does not provide a mechanism for NMFS to initiate the review of the monitoring area after the three-year evaluation period, which makes it difficult to ascertain whether removal of this area is an appropriate balance between the objective to *"simplify and streamline Atlantic HMS management...by reducing redundancies in regulations established to reduce bluefin tuna interactions"* with other objectives. NMFS is aware that area around the edge of the continental shelf in the Northeastern United States Closed Area is an important area for pelagic longline fishermen to target swordfish and BAYS tunas. The preferred alternative will allow access to that area for fishermen to pursue target species and collect fishery-dependent data to inform future management of the Northeastern United States Closed Area. Presuming that the distribution of target species in this area has not changed, removing the regulations associated with this area might provide additional fishing opportunities to pelagic longline fishermen and therefore be aligned with the objective to *"optimize the ability of the pelagic longline fishery to harvest target species quotas*". However, given the uncertainty associated with the length of time the area has been closed, it is unclear how closely aligned Alternative A5 would be with this objective. For these reasons, NMFS did not prefer this alternative in the DEIS or FEIS.

Cape Hatteras Gear Restricted Area

Comment 20: NMFS received comments in support of and in opposition to removal of the Cape Hatteras Gear Restricted Area (Alternative B2). Specifically, comments in favor of removal noted that this area is potentially redundant with the IBQ Program; that ecological benefits may be negligible due to low numbers of vessels which did not meet criteria for access; that the stock condition is improving; and removal of the Cape Hatteras Gear Restricted Area is consistent with section 304(g) of the Magnuson-Stevens Act (which requires fishing vessels be provided a reasonable opportunity to harvest allocation). NMFS also received suggestions on future steps if the Cape Hatteras Gear Restricted Area is removed. Specifically, that continued oversight over bluefin interactions (especially with

observers) with pelagic longline vessels in the Cape Hatteras region is necessary to monitor interactions with bluefin tuna and other bycatch.

Comments in opposition to removing the Cape Hatteras Gear Restricted Area noted that the existing gear restricted area measures have been effective at managing bluefin tuna and reducing bluefin tuna discards and serve as a deterrent against future bad behavior. Removal of the Cape Hatteras Gear Restricted Area could change fishing behavior and result in vessels directly targeting bluefin tuna. NMFS also received comments that the gear restricted area should be retained because it has not caused any economic hardships to date. NMFS also received comments that the Cape Hatteras Gear Restricted Area should be maintained because climate change may shift the location of future bluefin spawning into this area.

Response 20: NMFS agrees with the commenters that the Cape Hatteras Gear Restricted Area should be removed given data about the results of the implementation of the performance metrics, and the broader context of quota management of bluefin. NMFS would closely monitor future fishing activity by vessels in this area, and levels of bluefin tuna bycatch would be limited by the IBQ Program and other measures such as EM. Although removal of the gear restricted area would give vessel owners more flexibility in deciding where to fish, NMFS does not anticipate substantive changes to fishing behavior as a result of removal of the Cape Hatteras Gear Restricted Area because a majority of the fleet has had access to this area in recent years. Data presented in Chapter 4 of the FEIS (e.g., Figure 4.9 and Figure 4.11) shows that despite the majority of the fleet meeting criteria to access the area, the interaction and CPUE hotspots that previously was noted within the boundaries of the gear restricted area no longer exist. NMFS therefore agrees that the overall impact of the Cape Hatteras Gear Restricted Area on reducing bluefin interactions is likely low due to the small proportion of total effort that was excluded from the area as a result of access decisions and the temporary nature of the access decisions. Removal of the Cape Hatteras Gear Restricted Area is not anticipated to have negative impacts on the Western Atlantic bluefin stock. Since 2015, the catch of bluefin tuna (landings and dead discards) by the pelagic longline fishery has been well within the bluefin quota allocated to the Atlantic tunas longline category. The western Atlantic bluefin stock is not experiencing overfishing (see description of stock status under Response to Comment #1). However, whether the stock is overfished remains unknown as of the last stock assessment (completed in 2017). The total U.S. bluefin quota is consistent with ICCAT recommendations, which are based upon the best available scientific information on the status of the Western Atlantic bluefin stock.

NMFS agrees that in addition to evaluating the utility of the gear restricted area in reducing bluefin interactions, providing reasonable fishing opportunity is an important consideration in determining management actions. NMFS will continue to closely monitor bluefin catch in the Cape Hatteras area, and in the future may take additional steps to manage fisheries within this or other areas to address bycatch concerns. NMFS does not anticipate changes to observer requirements applicable to pelagic longline vessels fishing off Cape Hatteras or elsewhere.

Although the Cape Hatteras Gear Restricted Area has had some positive impacts in reducing bluefin tuna discards through the incentives associated with the performance metrics and conditional access, as a whole, the Cape Hatteras Gear Restricted Area is not needed to maintain the low level of bluefin catch documented by NMFS for 2015 through 2018. NMFS agrees that the gear restricted area may have curtailed interactions within the first few years following implementation, given that nearly 40 percent of vessels that fished in the area did not meet criteria for access in the first year of the program. However, more recently the vessels fishing locally within the Cape Hatteras region have met criteria for access to the gear restricted area. Vessels that did not meet criteria for access primarily fish in other regions, and therefore may not be incentivized to adjust and maintain "good behavior" to ensure access to the gear restricted area. NMFS disagrees that removal of the Cape Hatteras Gear Restricted Area will change behavior. As discussed above, only a small proportion of vessels recently did not meet criteria for access to the gear restricted area. The fishery has adjusted to new requirements under the IBQ Program, and new VMS reporting and EM monitoring requirements. Pelagic longline vessels are prohibited from targeting bluefin tuna with pelagic longline gear. However, while fishing for other target species they may elect to retain more bluefin than what was previously allowed (i.e., target catch requirements prior to 2015). These vessels must account for all incidental catch of bluefin tuna during direction fishing operations of the pelagic longline fishery for other Atlantic HMS, possibly incurring significant financial costs to obtain sufficient quota to cover landings or dead discards. NMFS disagrees that the Cape Hatteras Gear Restricted Area has not had any negative economic impacts. It is highly likely that some vessels not qualified to fish in the Cape Hatteras Gear Restricted Area incurred greater fishing costs on some trips where they fished in alternate locations instead of in the boundary of the Cape Hatteras GRA. NMFS agrees that climate change may substantially alter the spatial distribution of the life stages of fish, including bluefin tuna, but disagrees that continuation of the Cape Hatteras GRA is warranted based on current information concerning the primary spawning grounds for western Atlantic bluefin tuna or any hypothetical future changes thereof.

Comment 21: NMFS received comments that supported retaining the Cape Hatteras GRA and questioned whether there is a relationship between the performance metrics and the ability of vessels to avoid bluefin. Specifically, comments indicated that there was no rigorous scientific evaluation of the metrics, and that the Cape Hatteras Gear Restricted Area has weak accountability associated with it (i.e., no observers or "other recording system"). NMFS also received comments suggesting that the bluefin performance metric, which is used in part to determine access to the Cape Hatteras Gear Restricted Area, may reward under-reporting.

Response 21: NMFS disagrees that the performance metrics provided no incentive to avoid bluefin tuna. NMFS acknowledges that the relationship of the performance metrics to fishers' avoidance behavior is complex and drivers of such behavior may be variable, depending upon the performance metric formulas, the level of interest of vessels in fishing in the area, and the regulatory context of the gear restricted area. The performance metric formulas were specifically tailored to address an observed hotspot of bluefin interactions and compliance issues that were observed in the Cape Hatteras region at the time of

implementation. Nearly 40 percent of the vessels that fished in the gear restricted area did not meet criteria for access in the first year that the gear restricted area was implemented. Most of these vessels have subsequently met criteria for access due to lower bluefin interaction rates and improvements in logbook and observer program compliance. As discussed in the FEIS, the number of vessels which did not meet criteria for access that also operate locally within the Cape Hatteras region has decreased. Most of the vessels that did not meet criteria for access to the gear restricted area have recently fished elsewhere, such as the South Atlantic Bight, the high seas east of the Bahamas, the Northeast Distant Area, or the Gulf of Mexico. These vessels may not be incentivized to adjust behavior by access determinations because they do not fish in the Cape Hatteras Gear Restricted Area. Therefore, the application of the specific metrics in the context of the IBQ Program has recently had relatively low impact in achieving the objectives of the Cape Hatteras Gear Restricted Area (i.e., minimizing bycatch and bycatch mortality of bluefin tuna).

The implementation of the Cape Hatteras Gear Restricted Area coincided with the implementation of the IBQ Program under Amendment 7 (2015), and at that time the effectiveness of the IBQ Program was unknown. The gear restricted area therefore served as a secondary means to reduce bluefin interactions in this hotspot and was intended specifically to address the behavior of a few vessels responsible for the majority of interactions in the area. These vessels must now account for incidental catch of bluefin tuna during pelagic longline fishery operations through the IBQ Program, and have not accrued the same number of bluefin in sets recently made within the Cape Hatteras Gear Restricted Area. However, the removal of the Cape Hatteras Gear Restricted Area should not be interpreted as an indication that performance metrics are an invalid management tool.

NMFS disagrees that there was no scientific basis for the performance metrics. The design of the Cape Hatteras Gear Restricted Area was the result of an iterative process. In Amendment 7, NMFS analyzed multiple time periods and geographic areas in order to take into consideration both the potential reduction in the number of bluefin interactions and the potential reductions in target species retained. The analysis considered relevant fisheries data, and also oceanographic trends. NMFS identified appropriate performance metrics to address two issues: (1) relatively few vessels were consistently responsible for the majority of bluefin tuna dead discards in the Longline category; and (2) some vessels had poor records of compliance with reporting and monitoring programs that provide fishery data necessary for successful management of pelagic longline fisheries. Based on the performance metrics, between 7 and 34 vessels were determined to be not qualified to fish in the Cape Hatteras Gear Restricted Area (from 2014 to 2019). There was a declining pattern in the number of vessels that were not qualified on the basis of compliance with either logbook or observer requirements declined from 2014 to 2019. In contrast, the pattern in the number of vessels that did not meet criteria due to high bluefin interaction rates was more variable, with a slight increase over time. NMFS disagrees that there was weak accountability associated with the Cape Hatteras Gear Restricted Area. All pelagic longline vessels, including those that met criteria for access to fish in the Cape Hatteras Gear Restricted Area were subject to observer and electronic monitoring system requirements.

In the development of this final rule NMFS could have considered revision of the formula underlying the performance metric so that fewer bluefin interactions would result in a vessel being not qualified. However, it is not likely that the benefits associated with a revised Cape Hatteras Gear Restricted Area would outweigh the costs to vessels excluded from fishing in the area, given what is now known about the effectiveness of the IBQ Program. Reductions in bluefin interactions can be achieved through the IBQ Program, which provides incentives for vessels to reduce bluefin interactions, but also allows flexibility for vessels to make decisions when and where to fish.

NMFS acknowledges that individual accountability measures may incentivize certain behaviors such as underreporting. NMFS has implemented specific, enhanced monitoring and reporting procedures to discourage underreporting. As discussed in the 3-Year Review of the IBQ Program (e.g., see pg 52 and Figure 3.18), the frequency of bluefin catch is similar across observer, audited EM sets, and VMS set reports. NMFS also observed relatively good correspondence between logbook data and VMS data for the number of bluefin tuna released alive and number discarded dead (see Section 6.7). NMFS has not identified a significant underreporting issue in the Mid-Atlantic Region, but will continue to cross-validate data streams and take additional management or enforcement steps as necessary to address future underreporting of bluefin.

Spring Gulf of Mexico Gear Restricted Area

Comment 22: NMFS received comments in support of and in opposition to Preferred Alternative A4, which would undertake an evaluation of the Spring Gulf of Mexico Gear Restricted Area to assess its continued need to meet bluefin tuna management objectives. Comments in opposition to the Preferred Alternative noted that the Spring Gulf of Mexico Gear Restricted Area should be retained in order to order to protect western Atlantic bluefin tuna on a major spawning ground. Specifically, NMFS should not undertake management measures that could result in catch of spawning bluefin tuna or elevating the mortality rates in the Gulf of Mexico. The Gulf of Mexico is the known spawning ground for the western Atlantic stock of bluefin tuna, and thus the area is important to protect. Comments in opposition to the preferred alternative also noted the effectiveness of existing measures and indicated that removal would not meet the objective of minimizing bycatch and bycatch mortality of bluefin tuna. NMFS received comments in support of Preferred Alternative A4 for a variety of reasons, such as collecting more data to determine a future action, and balancing the objective of protecting bluefin tuna and optimizing the harvest of target species.

Response 22: NMFS acknowledges that current information shows the Gulf of Mexico contains the known spawning grounds for western Atlantic bluefin tuna, and that bluefin tuna present in the Gulf of Mexico during the early winter and spring are primarily there for spawning. NMFS agrees that bluefin tuna should be protected while on the spawning grounds. A number of management measures that limit bluefin catch and mortality in the Gulf of Mexico would still be in effect under the preferred alternative. For example, pelagic longline vessels would still be required to comply with the requirements of the IBQ

Program. NMFS designed specific provisions of the IBQ Program to prevent potential increases in bluefin catch in the Gulf of Mexico, which could occur if fishing effort was redistributed from the Atlantic region. NMFS designated a separate quota for the Gulf of Mexico equivalent to 35 percent of the total Longline category quota, which limits overall bluefin catch in this region. In comparison to bluefin catch in the Atlantic region (which can be accounted for with allocation from the Purse Seine category or Gulf of Mexico IBQ allocation), Gulf of Mexico bluefin catch may only be accounted for with Gulf of Mexico IBQ allocation. This regional category designation, and stricter rules for Gulf of Mexico bluefin accounting, provides additional protection for spawning bluefin by restricting the amount of bluefin mortalities that can occur within the Gulf of Mexico. The IBQ Program also provides a constraint on effort, since pelagic longline vessels must acquire a minimum amount of Gulf of Mexico IBQ allocation in order to depart on a trip and must account for quota debt on a quarterly basis. NMFS has also preferred Alternative D2, which would retain a seasonal weak hook requirement in the Gulf of Mexico to provide additional protections for spawning bluefin. As discussed below and in Appendix B, a statistically significant 46 percent decline in CPUE has been associated with weak hook use. In addition, there are other enhanced reporting and monitoring requirements that support data validation in the monitoring area under the preferred alternative.

As discussed in Comment #1 above, NMFS agrees that existing management measures such as the gear restricted areas or weak hooks have been effective at reducing bluefin tuna interactions and dead discards. However, NMFS committed to a three-year evaluation of the effectiveness of gear restricted areas in Amendment 7. Page 30 of the Amendment 7 FEIS notes that the "*effectiveness of [the Gulf of Mexico and Cape Hatteras Gear Restricted Areas] depends on the defined area and time of the restriction(s) coinciding with the presence of bluefin in the area(s), the availability of target species outside of gear restricted area(s), the presence of bluefin outside the gear restricted area(s), annual variability in bluefin interactions, environmental conditions that may drive the distribution of bluefin, and other factors that affect the feasibility of fishing for target species outside of the gear restricted area(s)*." The easiest and most relevant means of considering these effectiveness measures in the context of pelagic longline fishery operations is through fishery dependent data collection.

NMFS disagrees that the preferred alternative would not meet the objective to *"continue to minimize bycatch and bycatch mortality of bluefin tuna*". Given the uncertainty associated with allowing pelagic longline fishing in an area that has previous been closed, NMFS agrees that it is appropriate to collect information to inform future management decisions. NMFS prefers a more incremental approach that focuses on data collection and requires a future rulemaking to remove the closed area from the regulations as opposed to removing regulations in this action. The evaluation period of both the Gulf of Mexico and Northeastern United States Closed Area will be closely monitored under a threshold designed for each area, which is intended to ensure that the proposed evaluation process would not result in high bluefin catch rates. In the event that bluefin catch is higher than this threshold, NMFS would close the area to pelagic longline fishing. Furthermore, as discussed in the Response to Comment #11 above, NMFS has adjusted the preferred alternative between the DEIS and FEIS to ensure that the threshold remains conservative in

the event that the U.S. allocation is adjusted at a future ICCAT meeting. In the event that ICCAT adjusts the U.S. allocation downwards, this threshold would also be adjusted downward such that it would be equivalent to 55 percent of the total Gulf of Mexico allocation. Furthermore, even if the threshold is reached, the incidental catch of bluefin tuna by the pelagic longline fishery would be within previously-adopted relevant levels, including the science-based overall quota, the Longline category quota and other limits adopted in Amendment 7, and the Gulf of Mexico allowable IBQ allocation.

As discussed in Comment #1 above, NMFS agrees that the preferred alternatives, including Preferred Alternative A4, are highly consistent with balancing the objectives of this rulemaking. While outright removal of the restrictions associated with the gear restricted area would provide the most flexibility to fishermen to select locations that would optimize target species catch and minimize bluefin bycatch that alternative would not provide the same amount of agency monitoring and control as would occur under an evaluation process as described under the preferred alternative. As discussed in Comment #1, the preferred alternative would also provide an opportunity to evaluate the continued need for the Gulf of Mexico Gear Restricted Area, with removal being one of many potential outcomes in a future rulemaking that considers next steps. Establishing such an evaluation process, instead of outright removal of the area, is therefore consistent with balancing the objectives to *"simplify and streamline HMS regulations...by reducing redundancies in regulations*" and the need to *"continue to minimize bycatch and bycatch mortality of bluefin tuna*".

Comment 23: NMFS received comments that the DEIS and proposed rule did not demonstrate whether the Gulf of Mexico Gear Restricted Area still contains areas of high concentration of bluefin, and therefore the agency has not determined whether the original rationale for closing the Gulf of Mexico Gear Restricted Area ("locations of high bluefin tuna concentrations and interactions with pelagic longline gear") is still valid.

Response 23: NMFS acknowledges that the current regulations do not allow for data collection, which makes it difficult to determine if these areas still meet the objectives for which they were originally implemented. Interannual variability in biological, oceanographic, or fishery conditions may shift the location of fishery interactions. As new information comes available concerning spatio-temporal bluefin interactions with the longline fleet, NMFS will consider whether it is appropriate to undertake different management actions. NMFS has incorporated such information into management in recent years. For example, between the draft and final EIS for Amendment 7, NMFS adjusted the boundaries of the Gulf of Mexico Gear Restricted Area eastward (as part of a new alternative) and added a second area for inclusion adjacent to the Desoto Canyon closure. As discussed in the FEIS for Amendment 7, this adjustment was based on new information that had recently come available and public comment which suggested the original proposed boundaries would not be as effective. In this FEIS, NMFS has selected a preferred alternative that would implement this evaluation via fishery-dependent data collection to determine whether the Gulf of Mexico Gear Restricted Area still contain relatively high bluefin interaction rates. The evaluation process does not permanently remove the gear restricted area requirements from the regulations. Rather, it establishes a timeline for

evaluation and dictates the status (i.e., whether it is open or closed to pelagic longline fishing) of the closed area during that evaluation and development of a subsequent action.

Comment 24: NMFS received comments in opposition to making regulatory changes to the Spring Gulf of Mexico Gear Restricted Area, noting that the Spring Gulf of Mexico Gear Restricted Area has not had adverse economic impacts on the pelagic longline fleet. Comments also noted that the preferred alternative was bad for fishermen due to a decrease in the estimated pelagic longline revenue as a result of implementing the preferred alternative (according to the impacts analysis presented in the DEIS.

Response 24: The analysis of socio-economic impacts of Spring Gulf of Mexico Gear Restricted Area alternatives in Chapter 4 of the FEIS includes quantitative estimates of average annual revenues. These analyses were updated with an additional year of data in the FEIS and reflect a range of potential annual revenues for Longline category permitted vessels fishing in the Gulf of Mexico generated from select target species and incidentally-caught bluefin tuna. For the No Action alternative, such annual revenue in April and May (2015-2018) averaged approximately $677,007. For Preferred Alternative C3, the estimated range of potential revenues is between $538,151 and $687,962.

NMFS acknowledges that much of this range reflects a decrease in potential revenue from the Preferred Alternative compared to the No Action alternative. We expect, however, that fishermen would operate to optimize their revenues. Access to the Spring Gulf of Mexico Monitoring Area will give fishermen the opportunity to make decisions about where to fish depending on fish availability, and the flexibility to fish in areas that optimize target catch while minimizing bycatch. If swordfish and yellowfin tuna landings in the Gulf of Mexico decrease due to shifting effort into the Monitoring Areas, then fishermen would likely continue fishing outside of the areas. Thus, we expect that revenue results would bear out at the high end of the range.

NMFS disagrees that the Spring Gulf of Mexico Gear Restricted Area has not had adverse economic impacts on pelagic longline fishermen. In addition to the quantitative analyses, pelagic longline fishermen have commented during this rulemaking process that there are adverse economic impacts and regulatory burdens associated with complying with the number of regulations and restrictions on the fishery. During the effective period of the Spring Gulf of Mexico Gear Restricted Area, pelagic longline fishermen in the northern Gulf of Mexico must conduct fishing operations around the geographic patchwork of the Spring Gulf of Mexico Gear Restricted Area's two designated areas as well as the Desoto Canyon closure (See Figure 3.4.). These restrictions on available fishing grounds limit operational flexibility and fishermen cannot react as quickly to changing conditions--a particularly variable factor when fishing for highly migratory species such as bluefin tuna, yellowfin tuna, and swordfish. This, in turn, means that they cannot make decisions to best increase revenue and best avoid potential costs associated with accounting for incidental bluefin tuna catch. Fishermen have also reported general operational costs of having to move to fishing grounds farther away and incurring fuel and opportunity costs given the additional time that can be needed.

Given that we have concluded that all of the measures in place are likely not needed to continue to appropriately limit incidental catch in the pelagic longline fishery as first established in Amendment 7, it is appropriate for the agency to consider this feedback in examining how to relieve regulatory burden on individuals, minimize costs, and avoid unnecessary regulatory duplication. See 16 U.S.C. 1851(a)(7) (National Standard 7). This is consistent with the guidelines, which specify that management measures should be designed "to give fishermen the greatest possible freedom of action in conducting business and pursuing recreational opportunities that are consistent with ensuring wise use of the resources and reducing conflict in the fishery."

Comment 25: Commenters questioned the impact of the IBQ Program on reducing discards of bluefin tuna in the Gulf of Mexico. Some commenters stated that the Gulf of Mexico Gear Restricted Area, not the IBQ Program, is the reason for reductions in bluefin tuna bycatch in the pelagic longline fishery since implementation of Amendment 7 in 2015. Other commenters felt that the IBQ Program by itself cannot be credited with reduction in mortality in the Gulf of Mexico; therefore, removing the gear restricted area could compromise management objectives and could inappropriately increase catch of spawning bluefin tuna. Commenters noted that, based on Table 6.32 in the Draft 3-Year Review of the IBQ Program (pg 151), the rate of change in bluefin tuna catch in February and March versus in April and May is not constant before and after implementation of the closed area. Since the reduction in catch was not the same, these commenters felt that the IBQ Program alone cannot be credited with this reduction in mortality.

Response 25: Both the IBQ Program and the Spring Gulf of Mexico Gear Restricted Area, along with reduced fishery effort that has been occurring within the Gulf of Mexico over the last decade, have likely played a role in reducing bluefin tuna interactions. Because the IBQ Program and the gear restricted areas were implemented at the same time, it is difficult to separate out the impact each has had in relation to reducing bluefin tuna interactions and catch. NMFS therefore strongly prefers an evaluative option that will enable certain data collection under a single management tool, the IBQ Program. These data could then be compared to data that were collected while both the IBQ Program and the gear restricted areas were in place to better evaluate the impacts when both regulatory measures were in place against the impacts of having just one measure (the IBQ Program) in place. This evaluation will enable NMFS to determine whether there remains sufficient justification to retain both management measures, each of which may be effective in their own right but are not necessarily needed to continue in tandem to minimize bluefin tuna bycatch and bycatch mortality to the extent practicable given other management objectives that also must be considered, particularly where all of these actions occur within an overall, science-based total allowable catch.

NMFS received a specific comment on the Proposed Rule and DEIS, which drew conclusions about the continued need for the Spring Gulf of Mexico Gear Restricted Area in tandem with the IBQ Program. The commenter concluded, based on a relatively simple analysis of a limited set of data, that the IBQ Program alone could not appropriately limit incidental catch of bluefin tuna by the pelagic longline fishery in the Gulf of Mexico. As a number of other comments used this conclusion as their foundation, we determined a more in-depth response was warranted. Although NMFS considered the comment as presented, we concluded that it oversimplified a number of relevant factors, and that the conclusions drawn were not consistent with those that

would be drawn from a broader analysis. In Appendix E of this FEIS NMFS offers information to support our response to this comment, reviewing pelagic longline catch data from the Gulf of Mexico prior to and following the implementation of the Spring Gulf of Mexico Gear Restricted Area and the IBQ Program in Amendment 7. The information is included in an Appendix given its length and the inclusion of several figures. Appendix E does not present any new or different information than was in the DEIS, the referenced Three-Year Review of the IBQ Program, or in the analyses developed for Amendment 7.

NMFS agrees with public comment noting that Table 6.32 in the Draft 3-Year Review shows a reduction between two time periods (2012-2014 vs. 2015-2016), and that the magnitude of that reduction is greater for the months during which the Spring Gulf of Mexico Gear Restricted Area was effective (April and May), however these data reflect *landings*, which are only a subset of the relevant interactions that could inform effects, including reported mortalities, reported landings, reported discards, and reported dead discards across multiple time periods. The comment also compared an uneven number of years before (2012-2014, i.e., 3 years) and after (2015-2016, i.e., 2 years) implementation of Amendment 7 without standardizing the data, which might influence results since more years presumably result in more data and influences the weight of the variables influencing catch. As discussed in Appendix E, events in the management environment may influence year-to-year behavior within the fishery. In general, temporal data variables can influence fishery trend analyses. For example, analyzing years of data under different management requirements (e.g., the 2006 Consolidated HMS FMP versus previous FMPs; target catch requirements for retention of bluefin tuna versus accounting for bluefin incidental catch through the IBQ Program; before and after weak hook implementation) or in years where significant events may have an impact on fishing behavior (e.g., Deepwater Horizon oil spill, Hurricane Katrina) may have an impact on the conclusions of these analyses that might either be not relevant to the current management environment or unlikely to occur under normal circumstances. Furthermore, it takes time for a fishery to adapt to change. As shown in Table 3.4 of the DEIS, the number of swordfish retained by the fleet in the Gulf of Mexico decreased after implementation of Amendment 7 for two years before starting to increase in 2017. Therefore, just considering 2015 and 2016 as representative of a post-Amendment 7 environment may not be reflective of the current state of the fishery. This is why NMFS tends to estimate potential ecological impacts over multiple years of data and carefully considers the selection of years included in ecological impacts analyses. Therefore, for the information presented in Appendix E, NMFS presented data from different time periods in an effort to balance out the suite of variables that could have influenced information derived from the pelagic longline fishery's operations in the Gulf of Mexico.

As presented in Appendix E, NMFS found that the difference in the percent change by month varied depending on time period and which variable was considered in the analysis. For example, the change in landings of fish was higher during Gear Restricted Area effective months (April and May) than it was in the two months preceding the Gear Restricted Area effective months (February and March) when comparing time periods immediately prior to (2012-2014) and after (2015-2017) implementation of Amendment 7 management measures (Table E.3). However, a slightly different analysis comparing the change in average annual number of landings noted similar reductions in landings in February, April and May across a historical (2006-2012) and more recent (2015-2018) time period (Table E.3). NMFS found that adding a

year of data can change the conclusions that might be drawn (e.g., comparing reductions in landings in Table E.2 and E.3 in Appendix E).

In general, given the influence of time on data trends and the short periods of time analyzed by the commenter, NMFS believes these analyses demonstrate a benefit of data collection to inform future management.

The preferred alternative would allow fishery-dependent data collection to explore catch rates, landings, mortality, and other data in the Spring Gulf of Mexico Gear Restricted Area. By collecting fishery dependent data in this area while vessels are operating under the IBQ Program, NMFS will be better able to isolate the impacts of the gear restricted area and determine if both management measures are needed to meet the objectives for reducing bluefin tuna bycatch in the pelagic longline fishery as set out in Amendment 7 when both measures were adopted and consistent with the objectives of this rulemaking. Certain aspects of the IBQ Program (e.g., regional IBQ allocation designations and individual accountability) and design elements of this evaluation process (e.g., thresholds) will both allow for this data collection and stop pelagic longline fishing in the area if the fleet were to use Gulf of Mexico IBQ allocation in exceedance of an established annual threshold to account for bluefin landings or dead discards caught within the boundaries of the Monitoring Area. This will ensure that fishing is not counter to the objectives of "*minimiz[ing], to the extent practicable, bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear consistent with the conservation and management objectives of the 2006 Consolidated HMS FMP, its amendments, and all applicable laws*."

Regarding the effects of the preferred alternative specifically on spawning bluefin tuna, the preferred alternative may increase catch of bluefin tuna compared to the No Action alternative, although the actual predicted increase (versus the potentially allowable amount) is relatively minor. While some increases in target catch and bluefin tuna bycatch could occur as a result of removal of the area, any such increases would be within previously analyzed, applicable quotas and would be consistent with other management measures that NMFS determined appropriately limit bycatch and conserve the stock in Amendment 7, including the Longline subquota and the IBQ allocation provisions.

Comment 26: NMFS received comments requesting that NMFS expand the current Spring Gulf of Mexico Gear Restricted Area, by creating a larger box that encompasses both areas within a single larger closure in time and space.

Response 26: NMFS' management objectives under Amendment 7 included both the reduction of bluefin tuna interactions and dead discards, and to balance the need to limit landings and dead discards with the objective of optimizing fishing opportunity and maintaining profitability, among other things. One of the objectives of this rulemaking was to optimize the ability for the pelagic longline fishery to harvest target species quotas while also considering fairness among permit/quota categories. Expansion of the Gulf of Mexico Gear Restricted Areas is not considered to be consistent with current management objectives or objectives of this rulemaking because such a box would likely encompass the remaining, non-regulated pelagic longline fishing grounds in the northern Gulf of Mexico.

Closing these areas would remove most fishing opportunity for fleets that fish in these areas. Thus, NMFS did not determine expansion of this area was warranted.

In an analysis completed for the Amendment 7 rulemaking, NMFS also considered the need to gather scientific data from the Gulf of Mexico longline fishery for the development of effective conservation and management measures. A larger GRA (e.g., such as the Gulf of Mexico EEZ) was noted to severely reduce the collection of important data from the pelagic longline fishery and would increase uncertainty in the western Atlantic bluefin stock assessment. Gulf of Mexico pelagic longline data are critical to the development of CPUE information, which is used as the index of abundance for spawning bluefin tuna, an important element of the stock assessment for western Atlantic bluefin tuna. Such uncertainty would make it more difficult to assess the status of stocks, to set the appropriate optimum yield and define overfishing levels, and to ensure that optimum yield is attained and overfishing levels are not exceeded. NMFS conducted a "power analysis" to determine the number of pelagic longline sets that would be required to maintain the current level of precision for the CPUE and found that approximately 60 percent of the recent number of pelagic longline sets in the Gulf of Mexico would be required. Closing additional area would likely reduce the amount of available data for these stock assessment indices.

Weak Hooks

Comment 27: NMFS received comments that expressed support for the Preferred Alternative (D2) to require weak hooks in the pelagic longline fishery for six months of the year (January - June) in order to reduce bycatch of bluefin in the winter and spring and white marlin in the summer and fall. NMFS also received comments in opposition to the preferred alternative, indicating that weak hook use in the summertime has no ecological value, so fishermen will not care if the requirement goes away. Other comments indicated that the IBQ Program is sufficient for its purpose.

Response 27: NMFS agrees that implementing a seasonal requirement for weak hooks in the Gulf of Mexico will provide protections for bluefin tuna during the spawning season and may decrease bycatch of white marlin in the summer and fall. The preferred alternative, which would implement a seasonal weak hook requirement, was selected in the DEIS and the FEIS as the alternative expected to strike the best balance between the objectives of "*continue to minimize…bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear…".*and to "*optimize the ability of the pelagic longline fishery to harvest target species quotas*". This alternative provides increased flexibility with respect to hook requirements in the second half of the year (provided basic circle hook requirements are still met). This alternative only requires the use of gear intended to minimize bluefin bycatch when spawning bluefin are abundant in the Gulf of Mexico and the ecological benefits for spawning bluefin are the greatest (i.e., in the first half of the year). The preferred alternative in the FEIS would not prohibit the use of weak hooks in the summer and fall. Some commenters from pelagic longline fishermen in the central Gulf of Mexico prefer the use of weak hooks year round. These fishermen noted that yellowfin tuna catch is slightly higher with weak hooks and they may continue to use weak hooks during the

months that they are not required. NMFS agrees that the use of weak hooks in the summer (i.e., after June) may not provide ecological benefits to bluefin tuna. Removing the weak hook requirements when they have negligible ecological benefit for spawning bluefin (due to low abundance in the second half of the year) is consistent with the rulemaking objectives to simplify and streamline Atlantic HMS management by reducing redundancies in regulations established to reduce bluefin interactions. NMFS also designed this alternative to mitigate bycatch of white marlin. This alternative therefore balances the bycatch mitigation needs for two different species, which is consistent with the alternative to "*continue to minimize…bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS by pelagic longline gear…"*

Comment 28: NMFS received comments that suggested that weak hooks should only be required while pelagic longline vessels are fishing in the within the boundaries of the Gulf of Mexico Gear Restricted Area if the preferred alternative (Alternative C3) was finalized.

Response 28: NMFS disagrees with this comment to require weak hooks within the boundaries of the Gulf of Mexico GRA. Although the catch rates were higher in the Gulf of Mexico GRA during the Amendment 7 rulemaking, distributions of spawning bluefin tuna may change throughout the Gulf of Mexico and requiring their use in all portions of the Gulf of Mexico will maximize the conservation benefit provided by weak hooks. Additionally, requiring weak hook use in a discrete area of the Gulf of Mexico may present enforcement challenges and require extensive at-sea resources. Some fishing could occur on the border of the current GRA and gear drift could inadvertently create compliance issues.

Comment 29: Weak hook regulations are obsolete and redundant given that the restrictions of a vessel's IBQ maintains the conservation goals in the Gulf of Mexico and elsewhere.

Response 29: NMFS disagrees that weak hooks are redundant with the IBQ Program for maintaining low levels of bycatch of bluefin tuna in the Gulf of Mexico. While the IBQ Program incentivizes fishery participants to avoid bluefin tuna, there is a proven scientific benefit in the use of weak hooks with pelagic longline gear in the Gulf of Mexico. Research has shown a statistically significant 46 percent decline in catch-per-unit-effort associated with weak hook use. The release of large spawning bluefin tuna caught on weak hooks creates conservation benefits to the western Atlantic bluefin tuna stock during the spawning season.

Comment 30: NMFS received comments that a weak hook requirement from January through June would continue to severely impact the winter swordfish fishery in the eastern Gulf of Mexico. Comments indicated that there has been a large reduction in swordfish landings in the eastern Gulf of Mexico winter swordfish fishery; that there is no conservation value to maintaining this regulation in the eastern Gulf of Mexico; and that the loss of revenue is making it harder to find crew for longline boats. NMFS received comments suggesting that NMFS create a new spatially managed area in the southeastern Gulf of Mexico where weak hook use would not be required. NMFS also received comments suggesting that the monofilament on swordfish leaders that have straightened hooks are

usually vry opaque instead of clear, which may indicate physical stress on the line from a swordfish bill striking the leader as the escaped fish reacts to being hooked. One commenter estimated their 2017 losses at 5,000-6,000 lb of swordfish, with an estimated value of $30,000.

Response 30: NMFS investigated catch rates of several target species occurring in the area in the eastern Gulf of Mexico delineated by several pelagic longline fishermen during the development of the FEIS. Appendix D of the FEIS includes this data analysis. NMFS compared catch rates from the area from 2009-2011 (3 years prior to weak hook implementation; 2011 included since weak hooks were not mandatory until May) and 2015-2017 (3 years after implementation). Overall catch rates and landings of swordfish were annually variable from before and after implementation of weak hooks. Although variable from year to year data suggested landings and catch rates have not changed in this area since implementation of weak hooks in the Gulf of Mexico.

NMFS also analyzed bluefin tuna landings and dead discard catch rates and catch numbers. Bluefin tuna catches were slightly higher in the eastern Gulf of Mexico area delineated by several pelagic longline fishermen prior to the implementation of weak hooks. Since higher catch rates were experienced prior to implementation of weak hooks, there is likely to be a continued conservation benefit to retaining a seasonal weak hook requirement in the area shown in Appendix E of the FEIS because bluefin tuna are likely to still occur in the eastern Gulf of Mexico.

Comment 31: NMFS received comments indicating that the original NOAA weak hook experiments conducted between 2008 and 2012 occurred in a yellowfin tuna fishery, and resulted in few swordfish data points (and the swordfish interactions were mostly juvenile). This gives an inaccurate portrayal of the swordfish fishery in the Gulf of Mexico and the results of the study should not be used for management purposes.

Response 31: NMFS disagrees that the weak hook research was not representative of the entire Gulf of Mexico fishery. During the research conducted from 2007-2010, eight vessels were involved in the experiment observing 418 sets and deploying 245,881 hooks. An additional 51,067 hooks were deployed over 111 sets on 2 vessels in 2012. A Fisher's Exact, which is a common statistical test used to determine significance of two classes of objects, in this case the object being hooks (weak and standard) and significant differences in their catch rates, was used to analyze results. The research however did show reductions in the amount of target catch of yellowfin tuna and swordfish; however, these reductions were not statistically significant.

NMFS also compared the catch rates, prior to and after implementation, of weak hooks of several species from the entire Gulf of Mexico in Appendix C of the FEIS. In general, actual weak hook effects match results from the 2007-2010 research project. Bluefin tuna catch-per-unit effort and interactions both dropped after the requirement while catch-per-unit effort and interactions for swordfish, yellowfin tuna, and blue marlin remained relatively stable. White marlin/roundscale spearfish catch-per-unit effort and interactions increased with the use of weak hooks (Table C.2). White marlin and roundscale spearfish were

combined for analytical purposes because they can be difficult to tell apart, and because combination of data enabled a more robust sample size for analysis. Therefore, this data suggest that the weak hook research was an accurate representation of the Gulf of Mexico fishery.

Comment 32: NMFS received comments regarding a seasonal weak hook requirement stating that there is a substantial expense in changing gear type in labor and materials. Financial burden is not just associated with the cost of hooks. As shown in Chapter 3, Figure 3.2 and 3.3, pelagic longline gear consists of a mainline suspended in the water column, from which branch lines (which hang off the mainline and are used to suspend hooks in the water column). Monofilament line is used widely for both the mainline (the longline) and branchlines. Branchlines may incorporate a section of line (of variable length) known as a leader, with a lead weight at one end and the baited hook at the other. Commenters noted that they must purchase a different, stretchy type of leader to deploy with weak hooks that keep small swordfish from straightening the hooks. NMFS received comments that there is an impracticality to carrying double gear and/or storing the non-weak hook gear shoreside. Its takes a full crew two days to change out the gear. Additionally, because of regulations, the hooks must be corrosive and the aluminum crimps will eventually fail; extra supplies to support the deployed hook of choice are needed to be stored onboard. Few boats in the fishery have the deck capacity to carry double gear.

Response 32: NMFS disagrees with this comment because fishermen may fish with weak hooks in the Gulf of Mexico for the entire year if they wish to do so. The removal of the requirement for the July-December time period does not prohibit the use of weak hooks during that period. If fishermen find that using weak hooks throughout the year is less burdensome they may do so. NMFS recognizes that vessels that fish outside the Gulf of Mexico, may not be rigged with weak hooks and would need to re-rig their gear to use weak hook when the requirement is in effect. Due to little change in the catch and catch rates of swordfish in the Gulf of Mexico and the conservation benefit afforded to bluefin tuna when spawning, NMFS is at this time preferring a seasonal requirement. NMFS also notes that currently in the entire Gulf of Mexico, all vessels with pelagic longline onboard must only possess weak circle hooks 50 CFR § 635.21(c)(5)(iii)(B)(2)(i) (with limited exception when greenstick gear is also onboard).

Comment 33: NMFS received comments that noted a seasonal weak hook requirement may create enforcement concerns when switching between weak hooks and standard circle hooks.

Response 33: NMFS disagrees that modifying the weak hook requirement to become seasonal would reduce enforceability of the requirement. Enforcement officers have tools that allow them to determine the type of hook on board a vessel and are accustomed to making those determinations during vessel boardings. With this rule, the only change from an enforcement perspective is that it will not be necessary to verify the exclusive use of weak hooks on pelagic longline vessels in the Gulf of Mexico during the months of July to December.