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

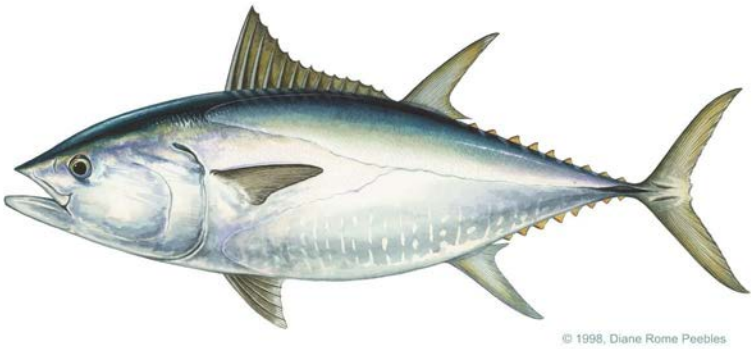
May 2019

NOAA FISHERIES

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

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

Including:
A Draft Environmental Impact Statement,
A Draft Regulatory Impact Review,
An Initial Regulatory Flexibility Analysis,
A Draft Social Impact Analysis



May 2019

Highly Migratory Species Management Division
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National Marine Fisheries Service
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Draft Regulatory Amendment to Modify Pelagic Longline Bluefin Tuna Area-Based and Weak Hook Management Measures

Abstract: Through the rulemaking process, the National Marine Fisheries Service (NMFS) is considering whether current area-based and gear management measures are still necessary to reduce and/or maintain low numbers of bluefin tuna discards and interactions in the pelagic longline fishery for Atlantic highly migratory species, given other, more recent conservation and management measures implemented in the fishery. 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; and requests from the public and HMS Advisory Panel members to reduce regulatory burden and remove duplicative regulations. NMFS takes these actions to (1) continue to appropriately conserve and manage Atlantic highly migratory species (HMS), including bluefin tuna; 2) simplify and streamline Atlantic HMS management; (2) optimize the ability of the pelagic longline fishery to harvest target species quotas (*e.g.*, swordfish); and (4) continue to minimize, to the extent practicable, bycatch and bycatch mortality of bluefin tuna by pelagic longline gear.

Proposed Actions: Undertake a review process 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 weak hook effective period from year-round to seasonal (January - June).

Statement Type: Draft Environmental Impact Statement; Initial Regulatory Impact Review; Initial Regulatory Flexibility Analysis; Initial Social Impact Statement

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Executive Summary

The National Marine Fisheries Service (NMFS) is considering whether current regulations are still necessary to achieve conservation and management objectives for the pelagic longline fishery, or if measures can be streamlined to eliminate regulations that are redundant in effect.

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 preliminary results of a Draft Three-Year Review of the IBQ Program indicate that a management strategy of individual vessel accountability has successfully reduced bluefin tuna dead discards, improved timely catch reporting across the fleet, and addressed previous problems with bluefin tuna pelagic longline category quota overages. Furthermore, the Draft Review also implies that there is a healthy, functioning IBQ allocation leasing market to support 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 targeted 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 to examine whether older 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 certain regulations may be redundant in effect. 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 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 comment 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 the Northwest Atlantic stock of spawning bluefin. All comment submissions were considered in the development of this proposed rule.

In this document, NMFS considers a reasonable range of alternative management measures to evaluate potential adjustments to conservation and management measures that could both meet domestic and international management objectives for bluefin tuna and the pelagic longline fishery, and reduce unnecessary regulatory burden by streamlining, simplifying, or modifying potentially redundant regulations. For each spatially managed area, NMFS evaluates management alternatives that could retain current management measures; modify the boundaries of spatially managed areas by time or space; implement performance metrics to grant vessels controlled access to spatially managed areas if they have low rates of bluefin interactions and high compliance with observer and reporting (i.e. logbooks) requirements; establish an evaluation program in order to collect information to inform future management decisions for the area; or eliminate the spatially managed area. NMFS also evaluates three alternatives concerning weak hook regulations with the following alternatives: retain the current year round weak hook requirement in the Gulf of Mexico; implement seasonal, voluntary use of weak hooks; and elimination of the weak hook requirement.

Consistent with the regulations published by the Council on Environmental Quality, 40 C.F.R. 1501-1508 (CEQ Regulations), this document identifies the preferred alternatives that would meet conservation and management objectives while also reducing regulatory burden and providing additional opportunity to harvest target species. 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.

NMFS will take public comment into consideration before finalizing any alternatives, and the proposed measures may be altered or different alternatives may be adopted at the final rule stage. The CEQ regulations direct Federal agencies to the full extent possible to integrate the requirements of the National Environmental Policy Act (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 Draft Environmental Impact Statement (DEIS) required by NEPA with the fisheries planning and management requirements associated with proposed amendment to an FMP under the Magnuson-Stevens Act, the Initial 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 for Pelagic Longline Bluefin Tuna Area-Based and Weak Hook Management Measures

Preferred Alternatives in DEIS	
Northeastern United States Closed Area	*Alternative A4* Undertake a review process to evaluate the continued need for the Northeastern United States Pelagic Longline Closure
Cape Hatteras Gear Restricted Area	*Alternative B2* Elimination of the Cape Hatteras Gear Restricted Area
Gulf of Mexico Gear Restricted Areas	*Alternative C3* Undertake a review process to evaluate the continued need for the Spring Gulf of Mexico Gear Restricted Areas
Weak hooks	Alternative D2 Seasonal requirement for Weak Hooks

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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 216-6A.

Pelagic longline is not an authorized gear for directed fishing on bluefin tuna, but bluefin tuna are caught as bycatch in directed fisheries using pelagic longline gear to catch swordfish, sharks, 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, and vessel monitoring system reporting. Since implementation of these measures in 2015, there has been a substantial drop in bluefin tuna interactions and dead discards occurring in the pelagic longline fishery. Currently, NMFS has been considering whether some fleet wide measures implemented for bluefin tuna bycatch in the pelagic longline fishery are still needed to maintain low levels of bluefin tuna bycatch, given the IBQ Program. These measures include the Northeastern United States closed area, Cape Hatteras Gear Restricted Area, Spring Gulf of Mexico Gear Restricted Areas, and weak hook requirements in the Gulf of Mexico.

Based on further analyses and consideration of comments received on the scoping document, NMFS has developed this DEIS and proposed rule. Some of the alternatives included in the scoping document are included in this draft regulatory amendment, but other alternatives have been changed or added based on public comment and further analysis.

The alternatives in this DEIS would affect commercial Atlantic HMS pelagic longline fisheries and are listed in two categories (area-based alternatives and weak hook alternatives) for ease of

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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*)."

understanding. NMFS considered a range of alternatives for each category that would meet the purpose and need of this amendment. The alternatives are all described in detail in Chapter 2.

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 and albacore tuna, and, to a lesser degree, sharks. 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 tunas longline LAPs had been issued. In addition, approximately 185 directed swordfish LAPs, 72 incidental swordfish LAPs, 221 directed shark LAPs, and 269 incidental shark LAPs had been issued (NMFS 2018). Many of the regulations associated with current spatially managed areas are triggered by either the assignment of a permit to a vessel or by having a restricted 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 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 intended to protect and manage specific species, such as bluefin tuna, are discussed in further detail below.

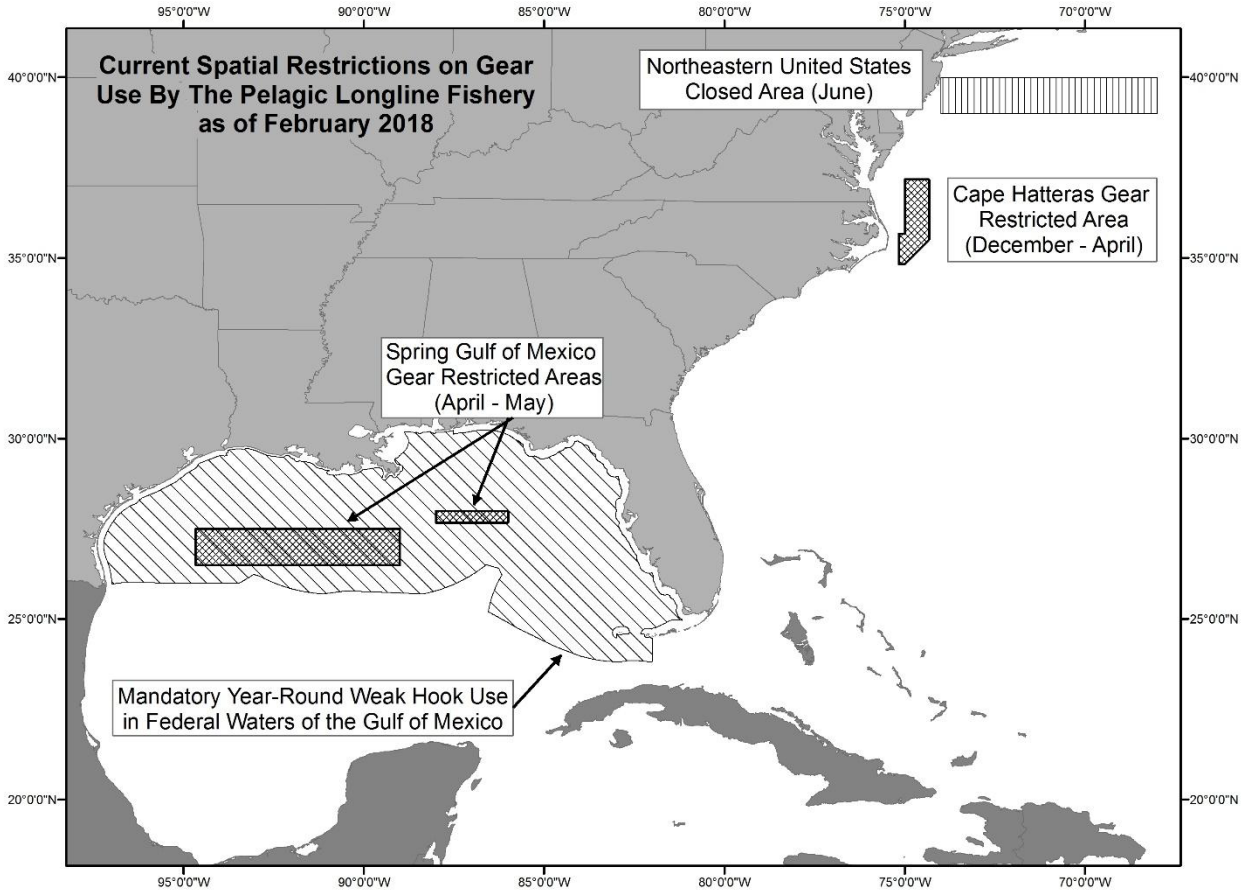

Figure 1.1 Map Including the Northeastern U.S. Closed Area, Amendment 7 Gear Restricted Areas, and Affected Area for Weak Hooks

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 time. 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. 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 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 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.

NMFS considered changes to the Northeastern United States Closed Area during the scoping process (April 23, 2012; 78 FR 24161) and Predraft for Amendment 7 to the 2006 Consolidated Atlantic 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.

Conditional Access to Closed Areas

During the rulemaking process for Amendment 7, NMFS considered an alternative that would grant permitted vessels conditional access to closed areas provided they 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 Chapter 3 of the FEIS for Amendment 7, NMFS did not prefer the alternative for conditional access to closed areas due to concerns raised during public comment. For this rulemaking on pelagic longline bluefin tuna area-based and weak hook management measures, NMFS has developed analyses to consider potential changes or access to individual closed areas, rather than a collective approach for all areas. 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 Areas

Amendment 7 implemented several gear restricted areas to reduce pelagic longline gear interactions with bluefin tuna off the coast of Cape Hatteras is closed from December 1 through April 30 annually. The Spring Gulf of Mexico Gear Restricted Areas consist of two areas in the central and eastern Gulf of Mexico. Both Gulf of Mexico Gear Restricted Areas are closed to pelagic longline gear from April 1 through May 31 annually. These areas were identified as locations of high bluefin tuna concentrations and interactions with pelagic longline gear. 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 (e.g., swordfish, yellowfin tuna, bigeye tuna, pelagic sharks, dolphin, wahoo) landings, compliance with the pelagic observer program, and timely submission of logbooks. For the 2018-2019 effective period of the Cape Hatteras Gear Restricted Area, 83 out of 97 vessels evaluated were granted access to the area based on high bluefin avoidance and compliance scores. The Spring Gulf of Mexico Gear Restricted Areas are closed 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. Prior to Amendment 7, bluefin tuna bycatch was disincentivized primarily through target catch requirements for limited allowable bluefin retention. When caught as bycatch in a directed fishery, 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. Target catch requirements were revoked under Amendment 7 in favor of the IBQ Program to manage bluefin tuna bycatch and dead discards.

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

1. Two pelagic longline gear restricted areas.
2. An Individual Bluefin Quota (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 of pelagic longline gear at haulback.
4. Catch reporting of each pelagic longline set using vessel monitoring systems (VMS).

The expanded electronic monitoring 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. Electronic monitoring 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 bluefin interactions or landings and meet minimum IBQ quota requirements on a quarterly, rather than trip-level, basis. (NMFS 2018)

Amendment 7 implemented IBQs for each qualified pelagic longline participant to reduce the number of bluefin tuna dead discards by limiting the number of landings and dead discards each fishery participant could have each year "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 Tuna 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 in-season 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 mortality.

Since implementation of Amendment 7 in 2015, 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 quota 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 three year review of the IBQ Program when finalizing Amendment 7. That document, the Three-Year Catch Share Program Review is currently in draft form (Draft Three-Year Review), but NMFS expects it to be finalized by September 2019. The draft document discusses whether and how the IBQ Program has met its objectives as identified under Amendment 7, which 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 Atlantic HMS FMP and the Magnuson-Stevens Act.

Preliminary analyses in the Draft Three-Year Review indicate that the IBQ Program has likely met or exceeded expectations for objectives 1- 3. Preliminary analyses in the review indicate 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), evidence of the effectiveness of the regulatory incentives to avoid bluefin, and the inherent flexibility available through the IBQ Program to account for bluefin mortality, address quota debt and minimize constraints on fishing for target species. The Draft 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. product, other regulations such as closed and gear restricted areas, as well as target species availability/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 Atlantic 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 Draft 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 Draft 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).

1.1.4 Public Feedback on Bluefin Tuna Management

Since implementation of Amendment 7 in December 2014 and January 2015, NMFS has noted 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 new regulatory environment established under Amendment 7.

At the Spring 2017 HMS Advisory Panel meeting, NMFS presented a summary of numerous requests from the public to determine whether the current suite of regulations are still needed to achieve management objectives for the pelagic longline fishery as identified in Amendment 7, which were:

- 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 of 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 Fall 2017 HMS Advisory Panel meeting, NMFS provided presentations on a range of ideas for potential management, and to further discussion on closed area and gear restricted area management and for weak hook management in the Gulf of Mexico to: 1) meet goals consistent with rebuilding and management plans for conservation of relevant stocks while optimizing the ability of permit categories to harvest target species; and 2) mitigate factors contributing to the continued decline in pelagic longline effort and swordfish landings. Area-based management issues were identified as a high priority for further consideration at that meeting. 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. 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 public 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.

The comment period for the scoping phase of this action was open for 60 days and closed on May 1, 2018 (see Appendix A for a summary of comments). During the 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 in effect, since the IBQ program has provided an individual vessel cap on bluefin mortality (landings and dead discards), established a system to enforce accountability for bluefin catch, and implemented incentives to reduce bluefin interactions throughout the year, and they felt that those measures have the needed effects of reducing bluefin

tuna bycatch mortality in the longline fishery. Pelagic longline fishermen and dealers believe 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. NMFS also 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 12,225 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.

1.2 Social and Economic Concerns

To satisfy mandates of NEPA and the Magnuson-Stevens Act subsections summarized below, this document identifies and evaluates the direct, indirect, and cumulative impacts of the proposed action on the social and economic elements of the human environment. These provisions are outlined in greater detail in Chapters 4.0 through 7.0.

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 the Magnuson-Stevens Act National Standard 8 (MSA sec. 301(a)(8)), which requires 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 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, 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; 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 enacted, overall revenue and effort has declined in the pelagic longline fishery (Table 1.1). Furthermore, NMFS has received suggestions from the public and HMS Advisory Panel members to reduce regulatory burden, and to consider whether regulations intended to accomplish similar objectives may be duplicative and overly burdensome on fishery participants. Thus, 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 maintain low rates of bluefin interactions and dead discards, consistent with the science-based conservation objectives for managing the stock. 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 Overall Revenue and Effort in the Pelagic Longline Fishery (2012–2017)

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

Source: HMS Logbook and relevant dealer data.

1.3 Scope and Organization of this Document

This DEIS 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 proposed 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 NOAA Administrative Order (NAO) 216-6A and the accompanying Companion Manual.

Section 304(i) of the Magnuson-Stevens Act required the Secretary of Commerce to revise and update agency procedures for compliance with NEPA in the context of fishery management actions developed pursuant to the Magnuson-Stevens Act, 16 U.S.C. § 1854(i). In compliance with that statutory provision, NOAA and NMFS established a line office supplement to NAO 216-6A, entitled, "Revised and Updated NEPA Procedures for Magnuson-Stevens Fishery Management Actions" (See 79 FR 36726, Jun. 30, 2014, and 81 FR 8920, Feb. 23, 2016). As stated in NAO 216-6A, section 6, this supplement remains in effect. The supplement 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 DEIS.

- *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 the Magnuson-Stevens Act, Executive Order 12866, and the Regulatory Flexibility Act. This document comprehensively analyzes the alternatives considered for all these requirements. Chapters 4, 6, and 7 provide the economic analyses; Chapter 6 meets the requirements under Executive Order 12866; Chapter 7 provides the Initial Regulatory Flexibility Analysis required under the Regulatory Flexibility Act; Chapters 8 and 9 also provide additional information that is required under various statutes. 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 whether some current area-based and gear management measures remain necessary to reduce and/or maintain low numbers of bluefin tuna discards and interactions in the pelagic longline fishery. 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 redundant in effect; and requests from the public and HMS Advisory Panel members to reduce regulatory burden and remove duplicative regulations. .

This document specifically evaluates the continued need for of management measures that were intended to reduce bluefin tuna dead discards (i.e., weak hooks, the Cape Hatteras and Gulf of Mexico Gear Restricted Areas, the NE 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.

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 not compromise the primary conservation goals 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 Atlantic 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 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.

In achieving these objectives, due to the success of the IBQ Program, NMFS will continue to pursue management strategies that emphasize *individual* vessel accountability over pelagic longline fleet-wide measures for managing bluefin tuna bycatch.

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.

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 proposed 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 1.0). 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 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, Marine Mammal Protection Act);*
- *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 (BiOps);*
- *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 DEIS 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

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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))

developed a range of alternatives considering changes to spatially managed areas that were 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. NMFS may make changes in the final EIS to meet the same purpose and need in response to public comment on this DEIS and the proposed rule. Such changes may include modifying the preferred measures, selecting different alternatives, or adding new measures. 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.

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 1st through June 30th of a given year.

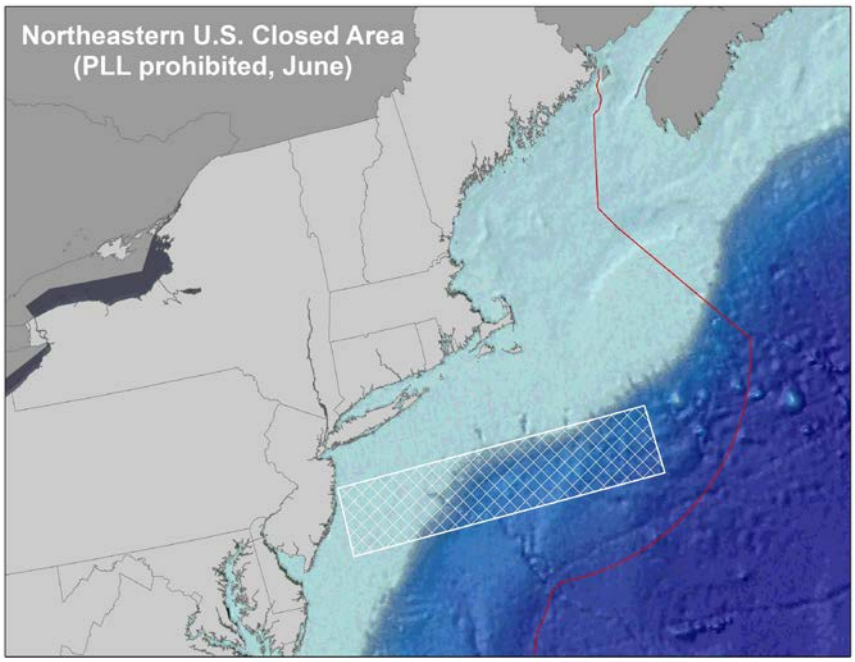

Figure 2.1 Northeastern U.S. Closed Area-Current Boundaries (White Polygon)

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

This alternative would modify the Northeastern United States closed area, as currently defined at § 635.2, by removing portions of the closure 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 (2015-2017) 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.

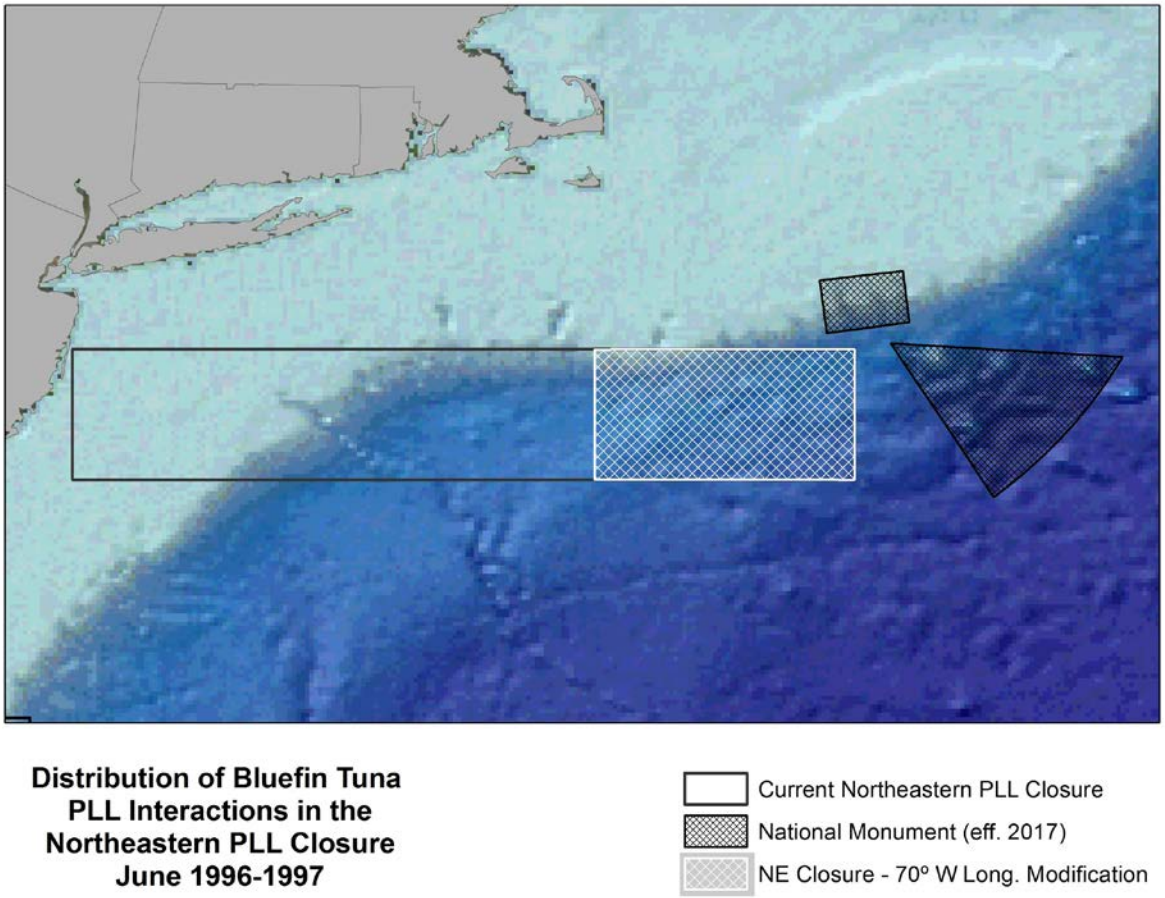

Figure 2.2 Location of the Current Northeastern U.S. Closed Area (Single Black Line) with Boundaries of a Proposed Modification Superimposed (White Border and Grid)

Alternative A3: Convert the Northeastern United States Closed Area and to A GRA 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" (i.e., the "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 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 remain open to pelagic longline fishing from June 1 to June 30 each year (previously, the area was closed to pelagic longline fishing during this time) (Step 1, Figure 2.3).

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. As discussed in Chapter 3, the overall pelagic longline category quota is subdivided for use in the Atlantic and Gulf of Mexico regions as Atlantic IBQ and Gulf of Mexico IBQ, respectively. This threshold would be 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. This threshold would ensure that opening the area to fishing would not compromise adherence to the quota needed to appropriately conserve and manage bluefin nor the ability of fishery participants to obtain enough IBQ allocation to cover bluefin landings and dead discards for the rest of the year. If the threshold is not met (Step 2, Figure 2.3, Scenario 1) during the month of June in a given year, then pelagic longline fishing could take place in the Monitoring Area in June of the following year. If the threshold is exceeded (Step 2, Figure 2.3, Scenario 2), the area would revert back to a closure for the remainder of June within that year, and would remain closed during the month of June in the subsequent years pending the final evaluation. 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 Pelagic Longline Monitoring Area would be closed to pelagic longline fishing.

Following the evaluation period, NMFS would conduct an evaluation of data collected from the Monitoring Area (Step 3). As part of this evaluation, NMFS would compile a report, which would 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 usage, compliance with other pelagic longline regulations, and amount of bycatch with restricted or protected species. This report would determine if a future rulemaking is necessary to modify the management of the Monitoring Area after the three year evaluation period. If the threshold has not been reached during the evaluation period (Step 1 and Step 2, Figure 2.3), then the Monitoring Area would remain open in following years while NMFS finalizes the evaluation report and considers next steps in a future action (green boxes under Scenario 1 in Step 3 and Step 4, Figure 2.3). If the threshold has been reached during the evaluation period, then the area would remain closed during future effective periods (red boxes under Scenario 2 in Step 3 and Step 4, Figure 2.3).

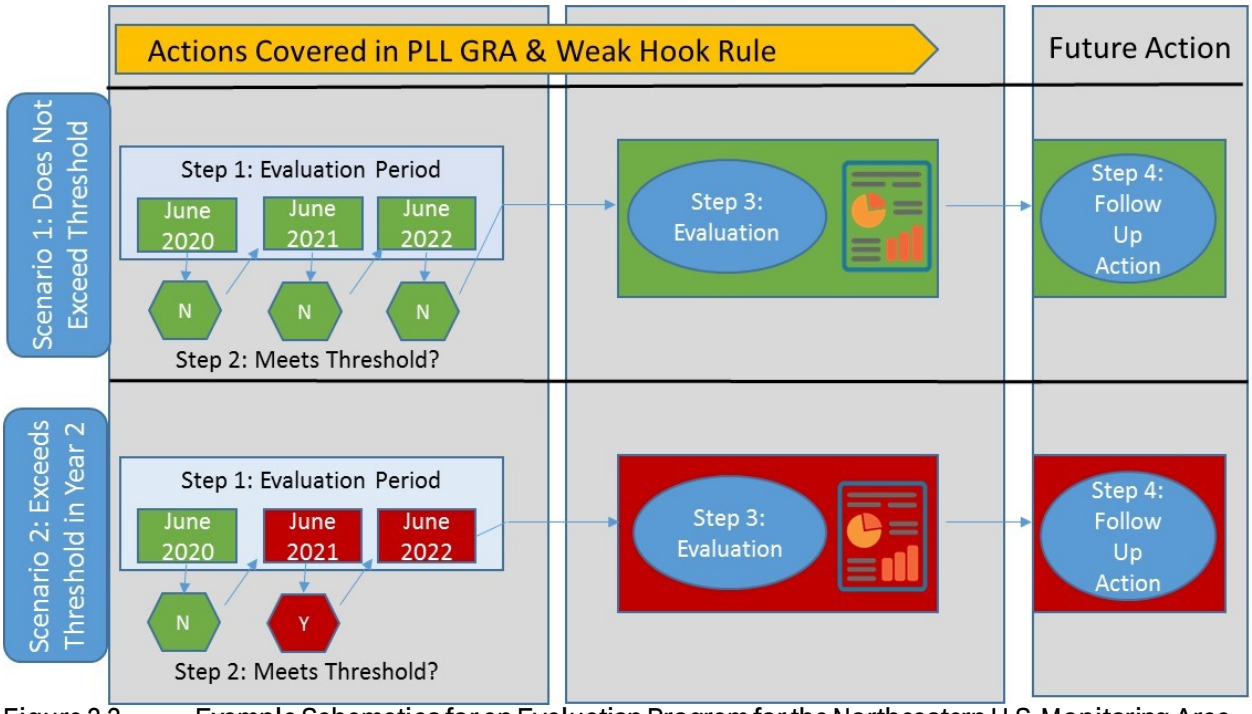

Figure 2.3 Example Schematics for an Evaluation Program for the Northeastern U.S. Monitoring Area

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.

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.

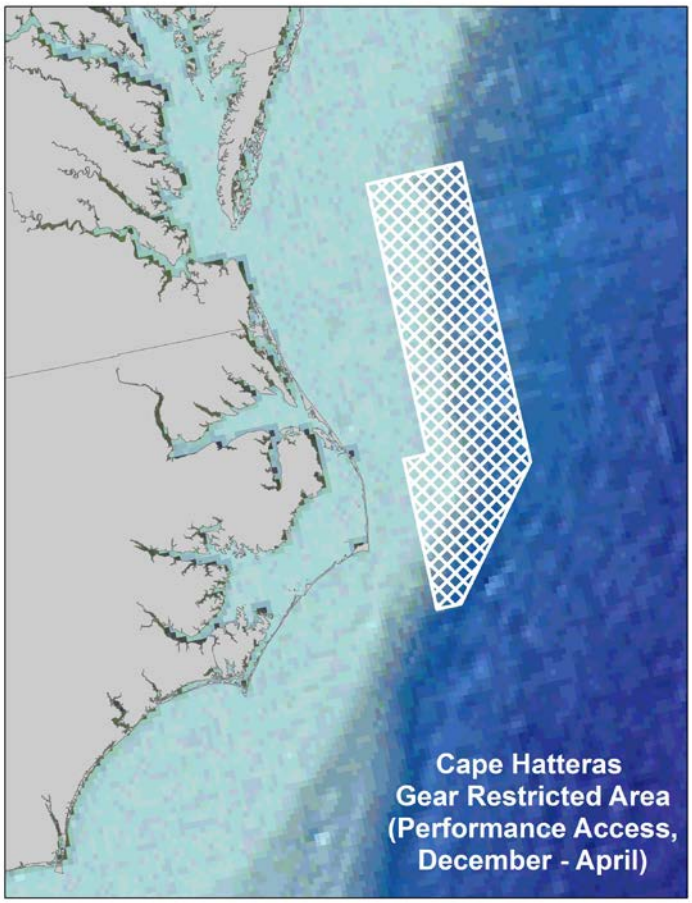

Figure 2.4 Cape Hatteras Gear Restricted Area-Current Boundaries

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 Areas

The Spring Gulf of Mexico Gear Restricted Areas are located in the Gulf of Mexico off the coasts of Louisiana, Mississippi, Alabama, and Florida. Per §635.2, the first areas 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.

Alternative C1: **No Action.**

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

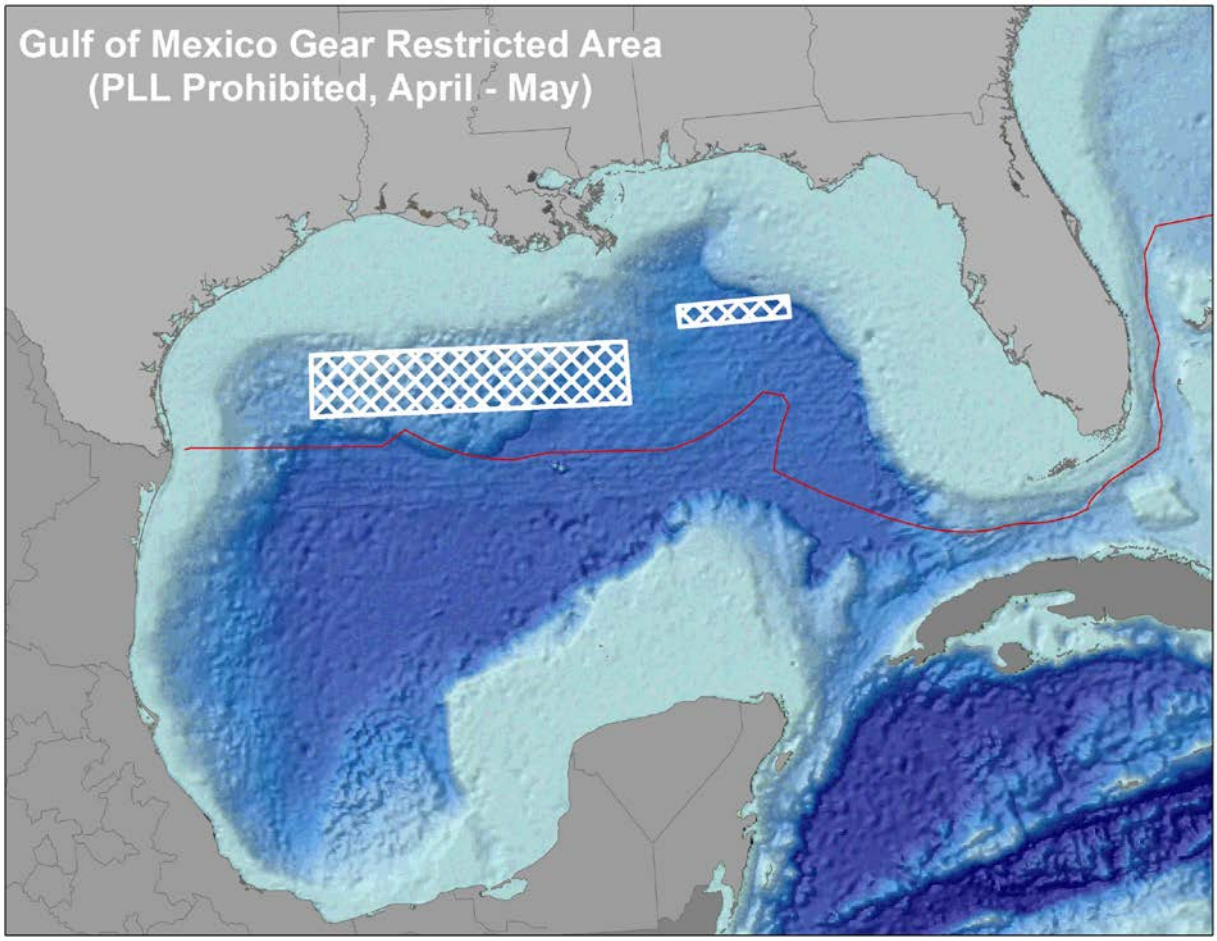

Figure 2.4 Gulf of Mexico Gear Restricted Area-Current Boundaries (White Polygons)

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

This alternative would allow performance-based access to the Spring Gulf of Mexico Gear Restricted Areas 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: Evaluate 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 the "Spring Gulf of Mexico Monitoring Area" (i.e., the "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 2.5) that would prohibit fishing 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 remain open to pelagic longline fishing during the months of April and May 31 of each year (previously the area had been closed to pelagic longline fishing during these months) (Step 1 of Figure 2.5).

NMFS would apply a threshold of 63,150 pounds of IBQ allocation that may be used to account for landings and dead discards of bluefin tuna caught within the boundaries of the Spring Gulf of Mexico Monitoring Area. As discussed in Chapter 3, the overall pelagic longline category quota is subdivided for use in the Atlantic and Gulf of Mexico regions as Atlantic IBQ and Gulf of Mexico IBQ allocation, respectively. This threshold would be equivalent to the amount of Gulf of Mexico IBQ annual allocation distributed to vessels that fished in the region while the closures were effective between 2015 and 2017. 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. 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 would not compromise adherence to the quota needed to appropriately conserve and manage bluefin. If the threshold is not met during the months of April or May in a given year during the Evaluation Period (Step 2, Figure 2.5, as indicated by green boxes under Scenario 1), then pelagic longline fishing could take place in the Monitoring Area in the months of April and May in the following year. If the threshold is exceeded (Step 2, Figure 2.5, as indicated by box shaded from green to red in Year 2 under Scenario 2), the area would revert back to a closure for the remainder of April and/or May within that year, and would remain closed in April and May of subsequent years contained within the three year evaluation period. 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 Pelagic Longline Monitoring Area would be closed to pelagic longline fishing.

Following the evaluation period, NMFS would conduct an evaluation of data collected from the Monitoring Area (Step 3). NMFS would compile a report, which would 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 usage, compliance with other pelagic longline regulations, and amount of bycatch with restricted or protected species. This report would determine if a future rulemaking is necessary to modify the management of the Monitoring Area after the three year evaluation period. Status of the areas (i.e., whether they are open or closed to fishing) in Steps 3 and 4 are contingent upon whether the threshold was reached during the evaluation period. If the threshold has not been reached during the evaluation period, then the area would remain open in following years while NMFS finalizes an evaluation report and considers next steps in a future action (Step 3 and Step 4, Figure 2.5, green boxes as indicated under Scenario 1). If the threshold has been reached

during the evaluation period, then the area would remain closed in following years (Step 3 and Step 4, Figure 2.5, red boxes as indicated under Scenario 2).

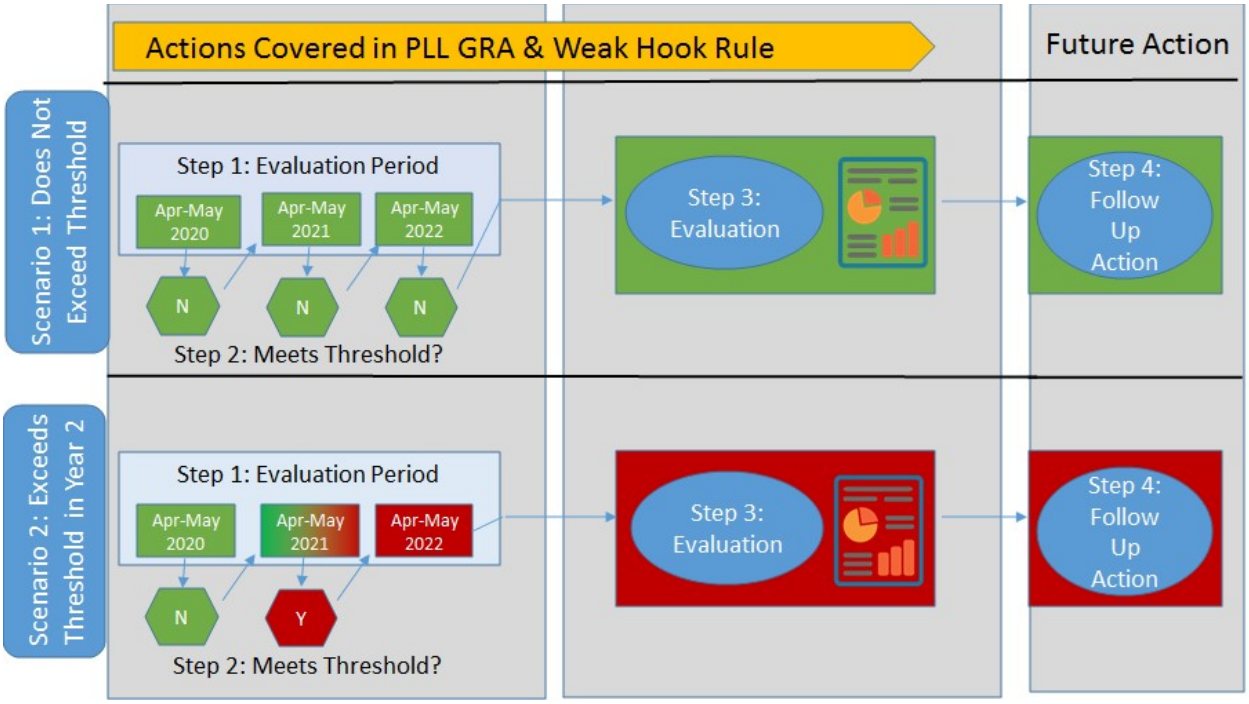

Figure 2.5 Example Schematics for an Evaluation Program for the Spring Gulf of Mexico Monitoring Area

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 Areas

This alternative would remove the Spring Gulf of Mexico Gear Restricted Areas 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).

Alternative D1: No Action

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 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.

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

NMFS considered whether modifications to the Cape Hatteras Gear Restricted Area should be included as alternatives 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. 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 established 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 GRA.

In considering alternatives for the present action, 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 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 to approximately 31 bluefin tuna per year (using 2015-2017 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 are 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 GRA 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 MSA management objectives. Because there are already measures in place that require the pelagic longline fleet to

account for bluefin interactions, 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 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 does 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 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.

3.1 Summary of Atlantic Highly Migratory Species Management

The authority to manage Atlantic HMS fisheries was 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. NMFS will share this rulemaking with the Atlantic, Gulf of Mexico, and Caribbean states and territories. To the extent practicable, NMFS will work with states, Councils, and the Atlantic and Gulf States Marine Fisheries Commissions to ensure complementary regulations are implemented across jurisdictions.

On the international level, and the United States participates in meetings of the International Commission for the Conservation of Atlantic Tunas (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 ecosystem 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 MSA §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 can be caught while preventing overfishing, and where necessary, rebuilding depleted stocks. The thresholds that NOAA Fisheries uses to determine the status of Atlantic highly migratory species (HMS) are presented in Figure 3.1. These thresholds are fully described in Chapter 3 of the 1999 Atlantic Tunas, Swordfish, and Sharks FMP (64 FR 29090; May 28, 1999) (1999 HMS FMP) and in Amendment 1 to the Billfish FMP (64 FR 29090; May 28, 1999), and were carried over in full in the 2006 Consolidated Atlantic 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 Fishery Conservation and Management Act (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.

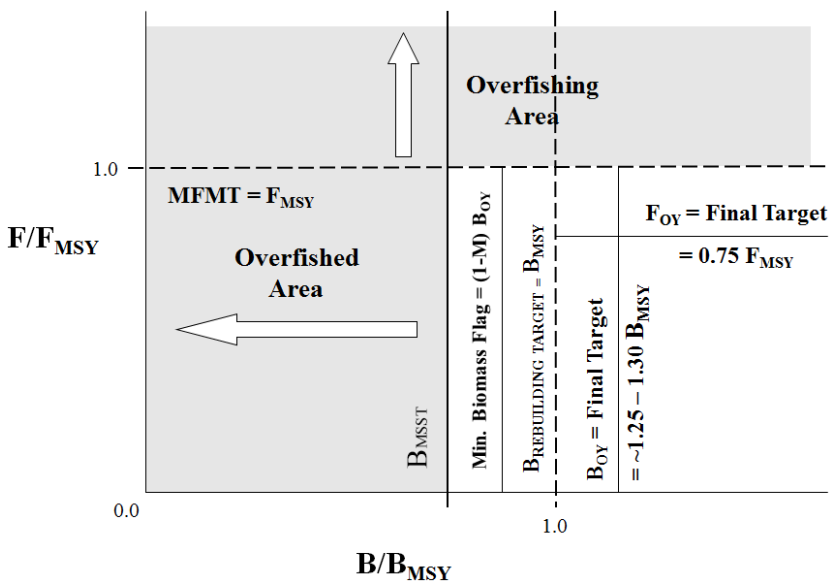

Figure 3.1 Illustration of the Status Determination Criteria and Rebuilding Terms

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 the International Commission for the Conservation of Atlantic Tunas (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 NOAA Fisheries 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-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 (NMFS 2019). In preparing this action and considering alternatives, NMFS considered relevant information in the most recent stock assessments for each of the stocks listed below. These stock assessments are listed in the table below (Table 3.1).

For the quota-managed stocks listed below, including western Atlantic bluefin tuna and North Atlantic swordfish, the actions considered and analyzed in this DEIS would not affect or alter the science-based quotas for the stocks. Only the time and place (i.e., for GRA/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 the International Commission for the Conservation of Atlantic Tunas (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_{2014}/B_{MSY} = 0.95 (0.71 - 1.36)	Unspecified †	B_{MSY}	0.5 B_{MSY} (age 2+)	Overfished	Not overfished	2016^
Atlantic Bigeye Tuna	B_{2017}/B_{MSY} = 0.59 (0.42 - .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}; (52,048 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_{2010}/B_{MSY} = 0.5 (0.42 - 0.60)	29,240 t (27,260 - 30,720 t)	B_{MSY}	0.85 B_{MSY} (23,171 - 26,112 t)	Overfished	Overfished	2012^
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	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 2019 (white marlin/roundscale spearfish, yellowfin tuna), 2020 (bluefin tuna), and 2023 (bigeye tuna)
Source: 2018 Atlantic HMS SAFE 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*), albacore tuna, and, to a lesser degree, pelagic sharks. Although this gear can be modified (e.g., depth of set, hook type, hook size, bait) to target swordfish, tunas, or sharks, 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, etc. 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 Marine Mammal Protection Act (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) 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 regulations. 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). 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 longliners may not possess commercial fishing gear within the boundaries of the monument is also prohibited, except when the gear is stowed and not available for immediate use during passage without interruption through the monument.

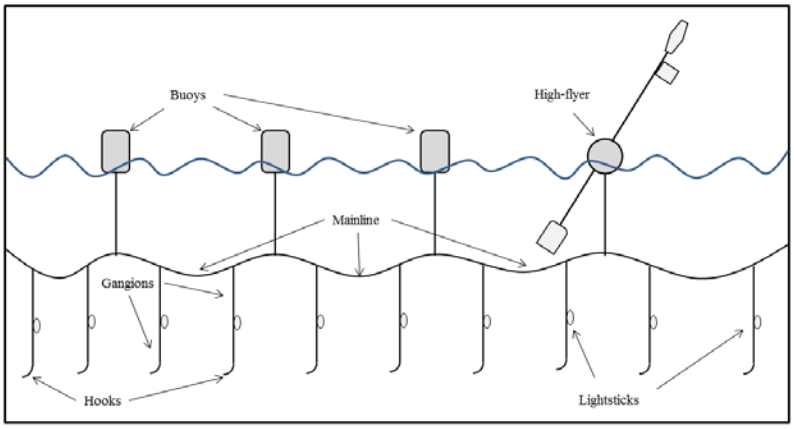

Figure 3.2 Typical U.S. Pelagic Longline Gear

Source: Redesign from original in Arocha (1997).

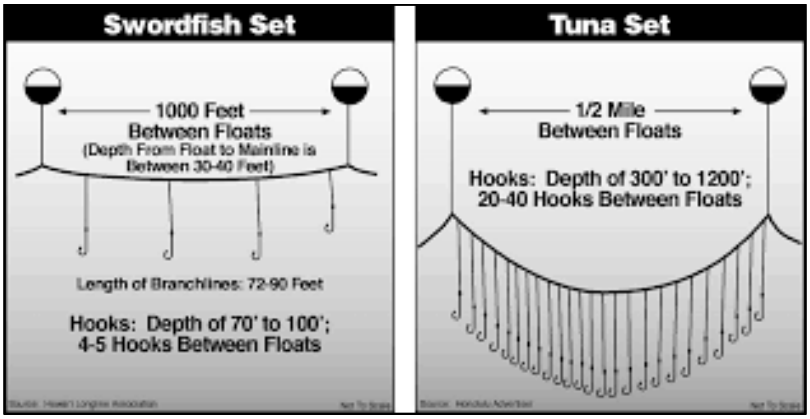

Figure 3.3 Pelagic Longline Gear Deployment Techniques

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, catches (landings plus dead discards) of bluefin by pelagic longline vessels had been significantly over 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 electronic monitoring (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.

3.2.1.2 International Management of Bluefin Tuna

ICCAT, with its 52 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. The Atlantic Tunas Convention Act (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's 2011 Endangered Species Act (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 Northeast Distant management area (NED) boundary. The Recommendation also details work to be undertaken by the ICCAT and its scientific body toward the anticipated adoption of management procedures, including a harvest control rule, for western Atlantic bluefin tuna by 2020. For eastern Atlantic and

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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.

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.

3.2.2 Bluefin Tuna Spatial and Gear Management: Closed Areas, Gear Restricted Areas, 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 to pelagic longline gear use designed to reduce the incidental catch of undersized HMS (e.g., 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, and is in the scoping phase, 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.)

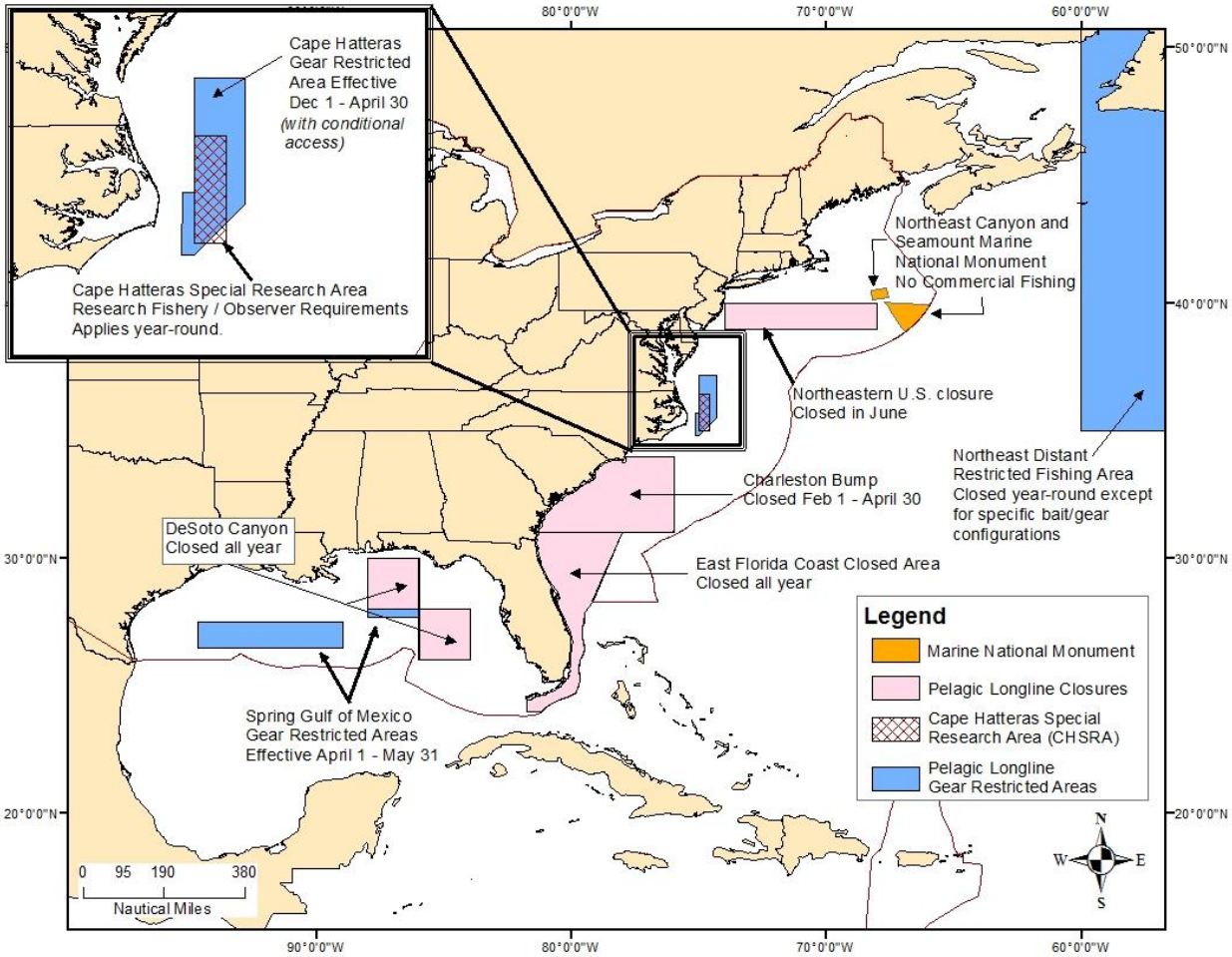

Figure 3.4 Examples of Current Spatially Managed Areas That Prohibit or Restrict Pelagic Longline Fishing by U.S. Flagged Vessels

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 on 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. 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 averaged 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

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

*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 Areas

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 or to during the two-month period from April through May each year is prohibited. NMFS implemented the Spring Gulf of Mexico Gear Restricted Areas 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 areas under Amendment 7 were to reduce bluefin interactions, thereby decreasing the potential for dead discards, and to optimize fishing opportunity. The gear restricted areas were 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). Ideally, a successful gear restricted area balances the conservation and management need for and ecological benefits of the restriction (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 gear restricted areas encompass areas with historically elevated bluefin interaction in the eastern-central Gulf of Mexico. The gear restricted areas in the Gulf of Mexico were 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 Areas were 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 tunas. 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 to identify trends before (2007-10) and after (2012-16) implementation (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.

In order to remove interannual differences, the mean reported landings for each period were calculated and compared. The mean reported landings of albacore tuna were greater following implementation. 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 (2007–2016)

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	1533.4	4,227	23	13,495	308	414	1,805	29	391
2007–10 mean	2,331.5	6,419.3	99.3	16,775	282.3	274.0	2,954	198	273.8
2012–17 mean	1967.5	5,596.3	48.0	16,143.2	209.2	409.8	1,821.0	80.8	313.7
2007–10 CPUE		2.7501	0.0426	7.1950	0.1211	0.1175	1.2670	0.0849	0.1174
2012–17 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.

3.3 Pelagic Longline Target and Bycatch Species Biology and Habitat

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

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 Essential Fish Habitat 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 lat. 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 PSAT on juvenile bluefin tuna (aged 2-5) captured in coastal recreational fisheries off Cape Cod from 2005 to 2009Tagged 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 essential fish habitat (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.

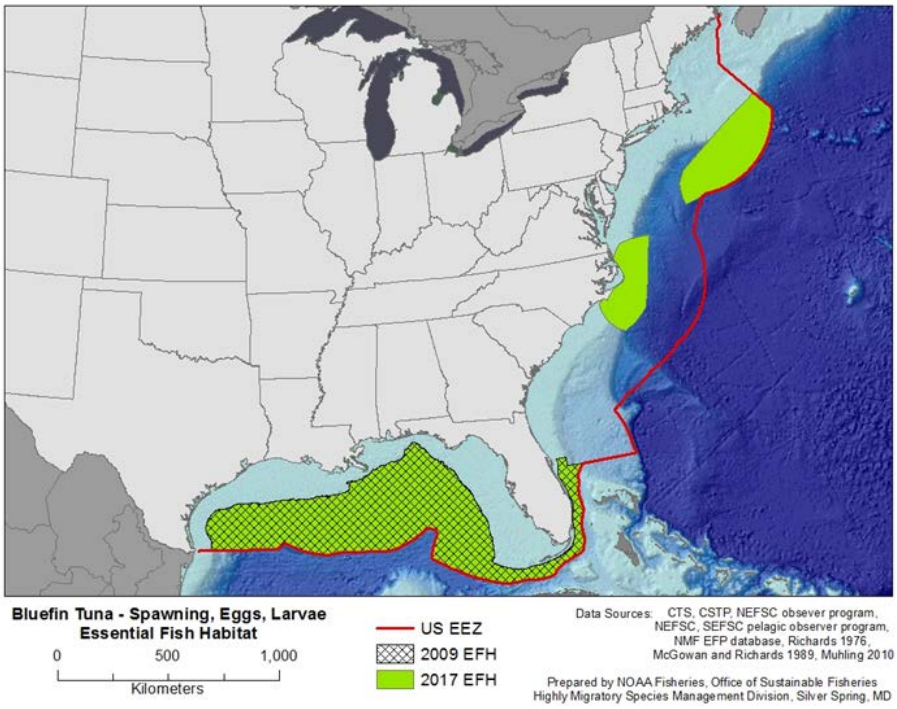

Figure 3.5 Essential Fish Habitat for Spawning, Eggs, and Larvae of Bluefin Tuna

Source: NMFS 2017.

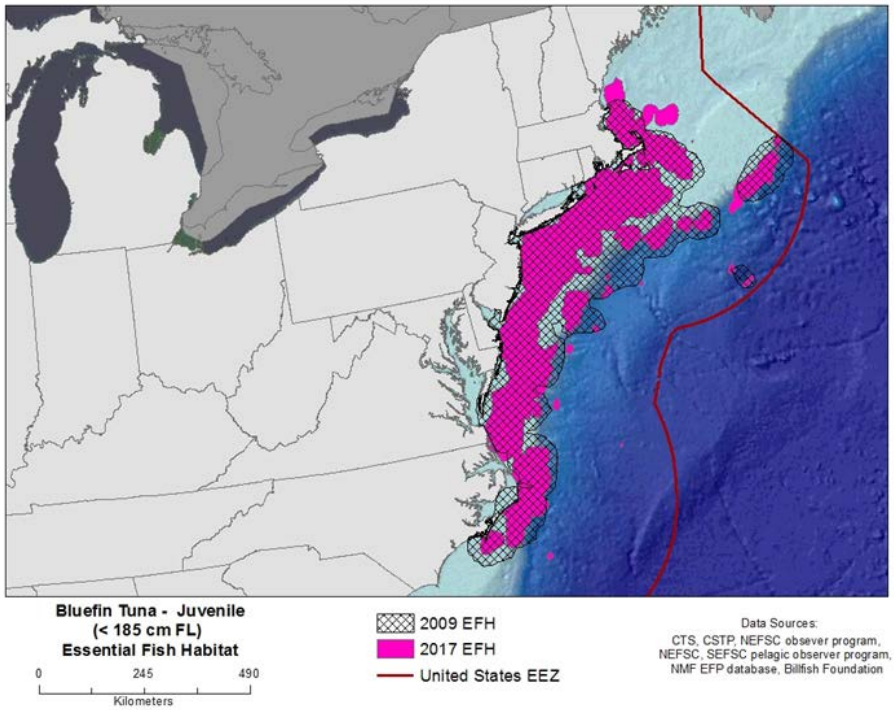

Figure 3.6 Essential Fish Habitat for Juvenile Bluefin Tuna

Source: NMFS 2017

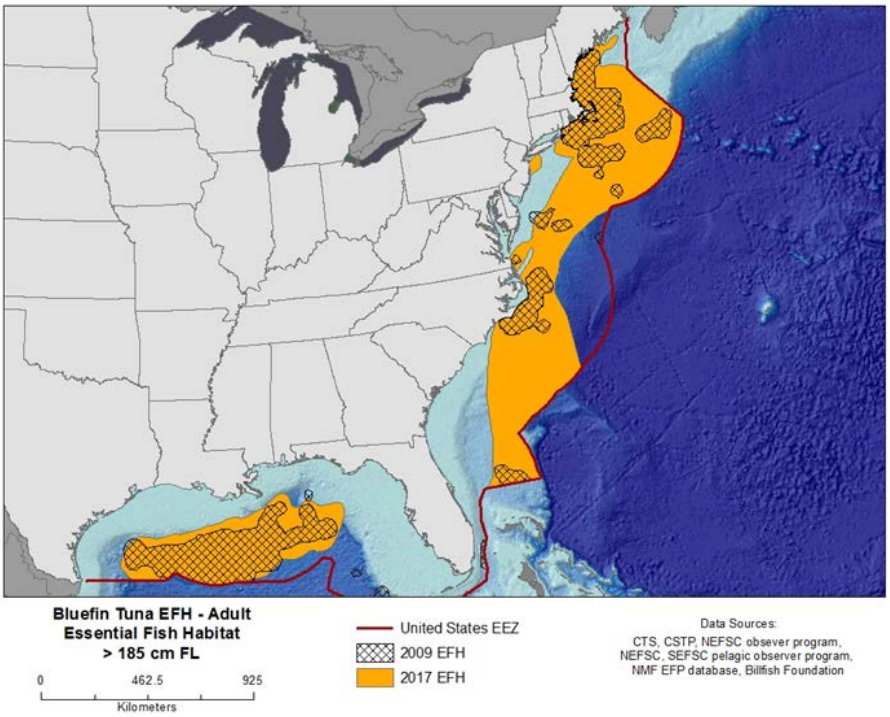

Figure 3.7 Essential Fish Habitat for Adult Bluefin Tuna

Source: NMFS 2017

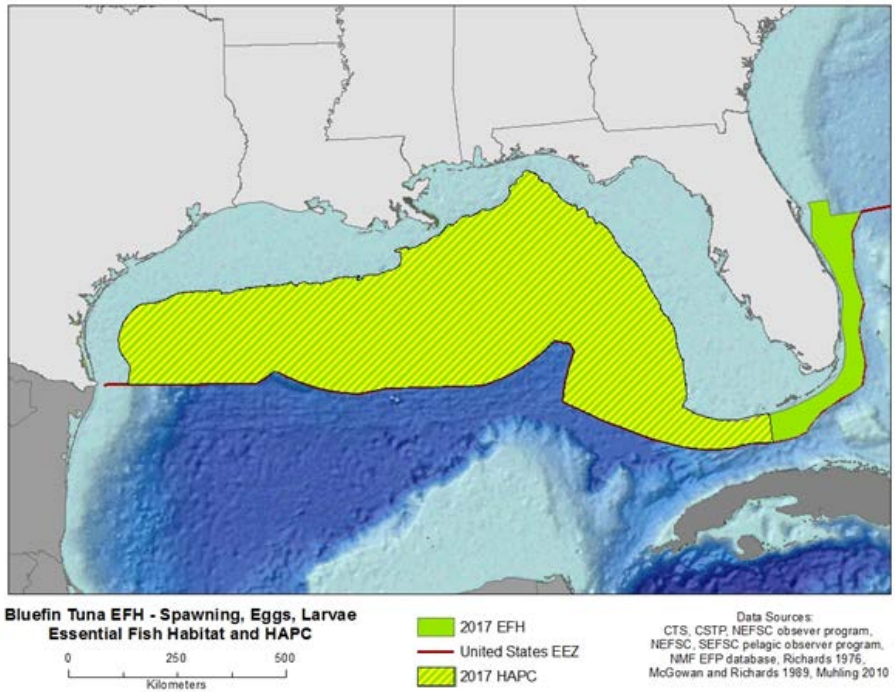

Figure 3.8 Bluefin Tuna Habitat Area of Particular Concern—Spawning, Eggs, Larval Life Stage

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

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 2017 (n ≈ 5,467,037). 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 3.8). 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 2015-2017 represents post-Amendment 7 activity.

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
2015–2017 (average annual #hooks fished)	5,467,037
Year	**Total Hooks Fished**
2015	5,855,977
2016	5,217,547
2017	5,327,587

Source: HMS logbook data.

Figure 3.10 shows the areas with the greatest fishing effort are the Gulf of Mexico, Mid-Atlantic Bight, South Atlantic Bight, Florida East Coast, and the Northeast Coastal. Since 2002, there have been notable trends in the distribution of pelagic longline fishing effort among the different areas. Gulf of Mexico fishermen were detrimentally affected by the Deepwater Horizon Oil Spill, as evidenced by large declines in both number of hooks and percentage of effort exerted in the Gulf of Mexico between 2009 and 2011. Changes in the percent distribution of effort are therefore more likely influenced by the activity of the Gulf of Mexico fleet in 2012.

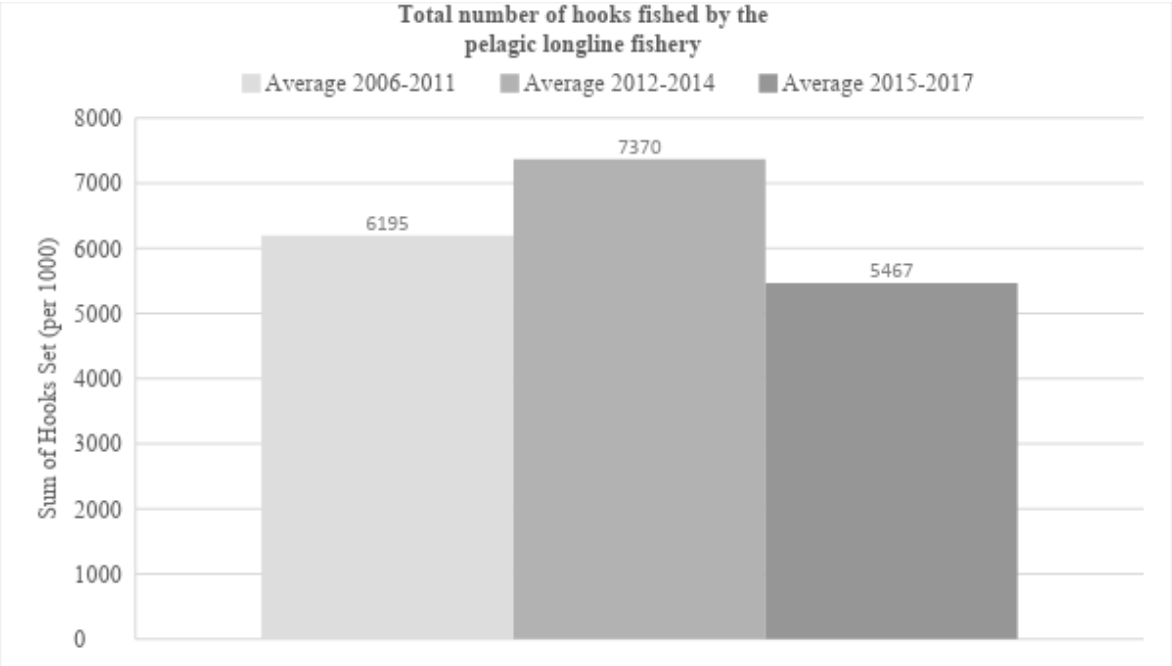

Figure 3.9 Average Number of Hooks Fished by the HMS Pelagic Longline Fishery from 2006–2011, 2012–2014, and 2015–2017

Source: HMS logbook data.

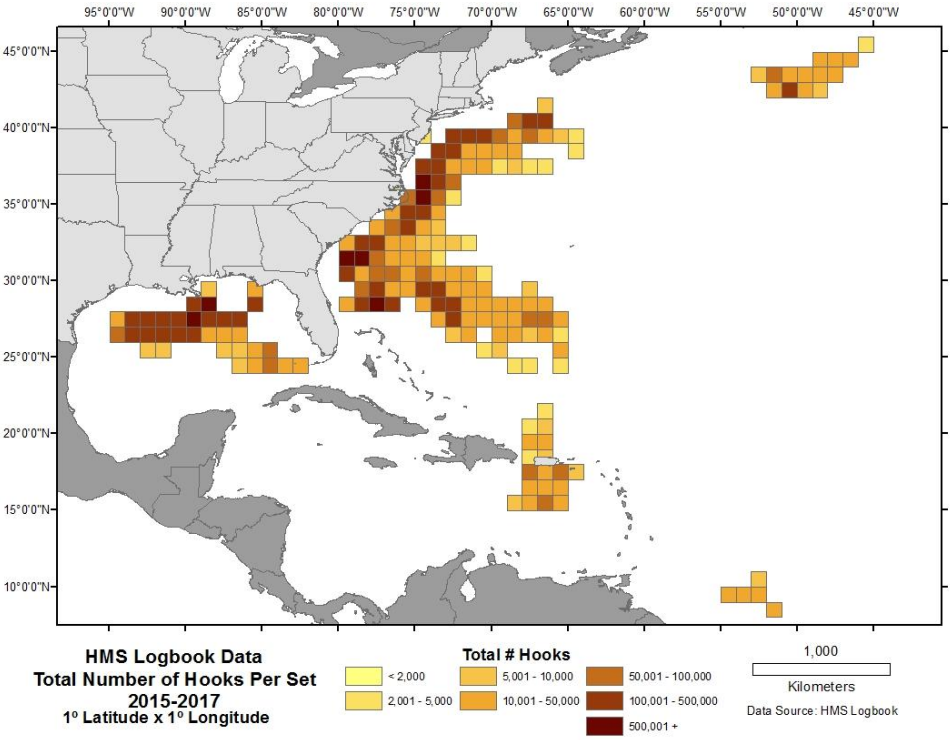

Figure 3.10 Reported Hooks Fished by the HMS Pelagic Longline Fleet (2015–2017)

Source: HMS logbook data.

3.5.2 Recent Fishery Trends and the Individual Bluefin Quota Program

The primary objectives of considering pelagic longline gear restricted areas in this rulemaking are to reduce bluefin interactions, thereby decreasing the potential for dead discards, and to optimize fishing opportunity. 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 Area) are presented, as are and the Individual Bluefin Quota (IBQ) Program.

3.5.2.1 Fishery-Wide Catch Data

Spatial distribution of pelagic longline target species catch-per-unit effort (catch per 10,000 hooks) is shown in Figures 3.11 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), and in the Sargasso Sea (seaward of the Bahamian EEZ). Dolphin catch-per-unit effort hotspots occurred mainly within coastal regions of the South Atlantic Bight. 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.

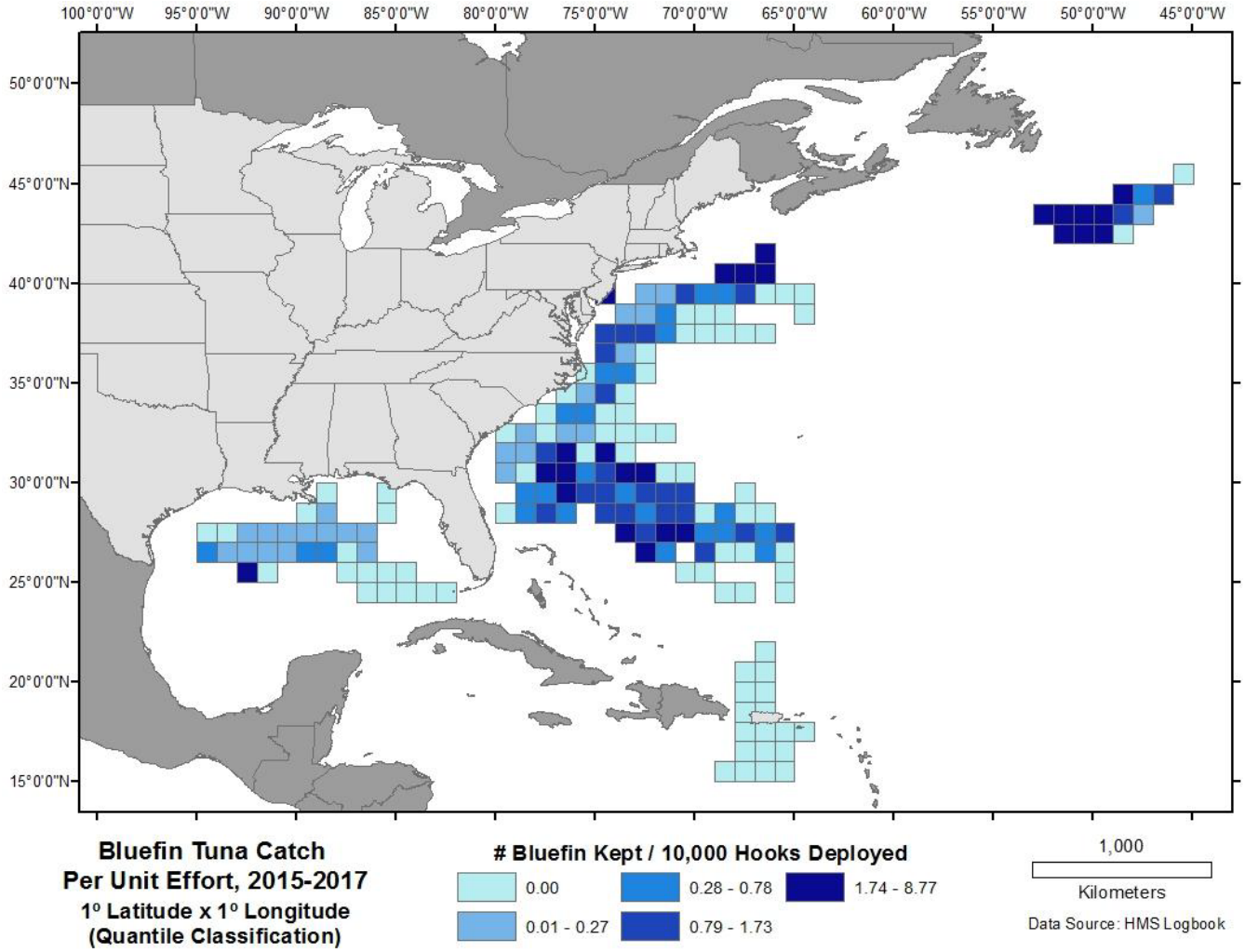

Figure 3.11 CPUE of Bluefin Tuna (2015–2017)

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.

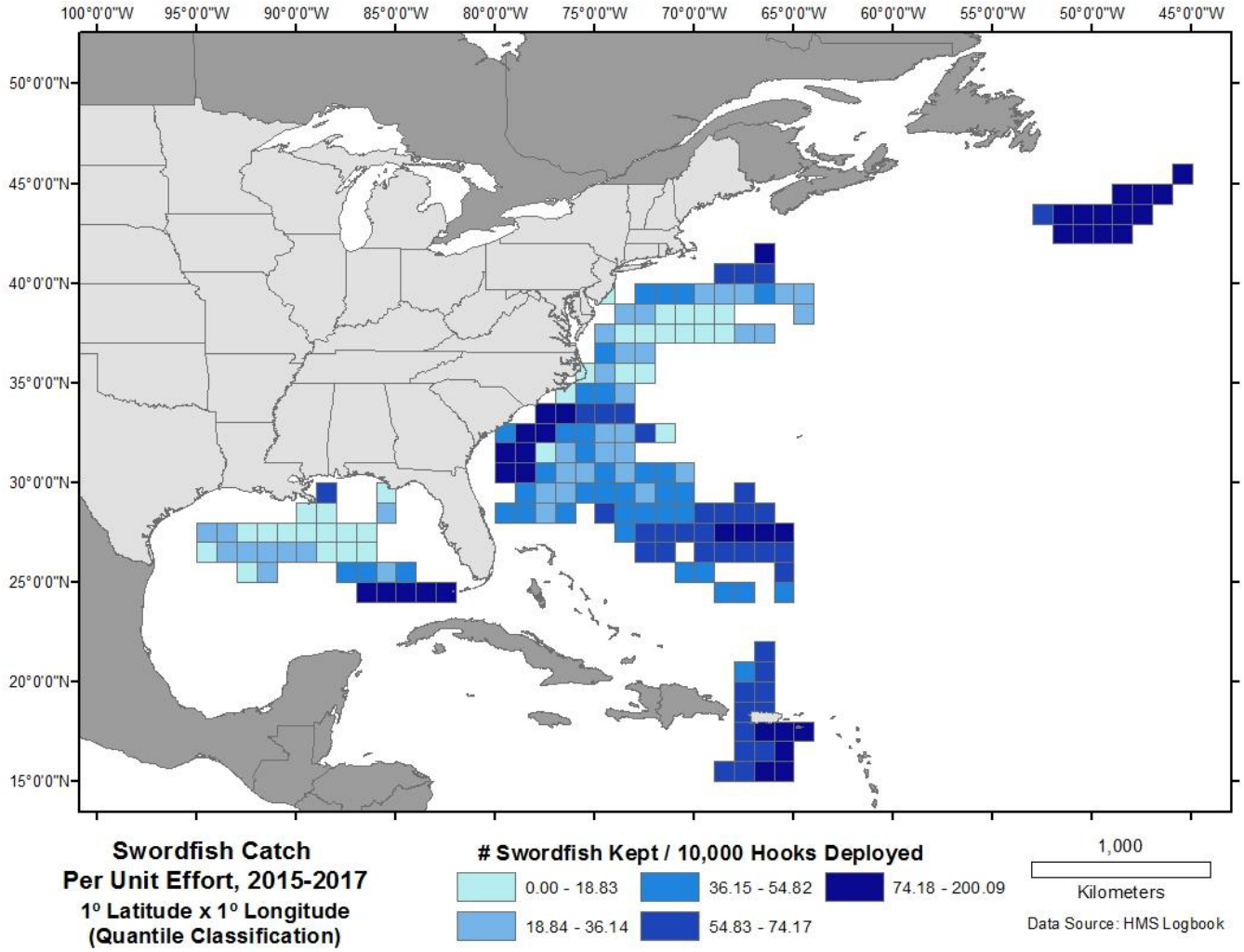

Figure 3.12 CPUE of Swordfish (2015–2017)

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.

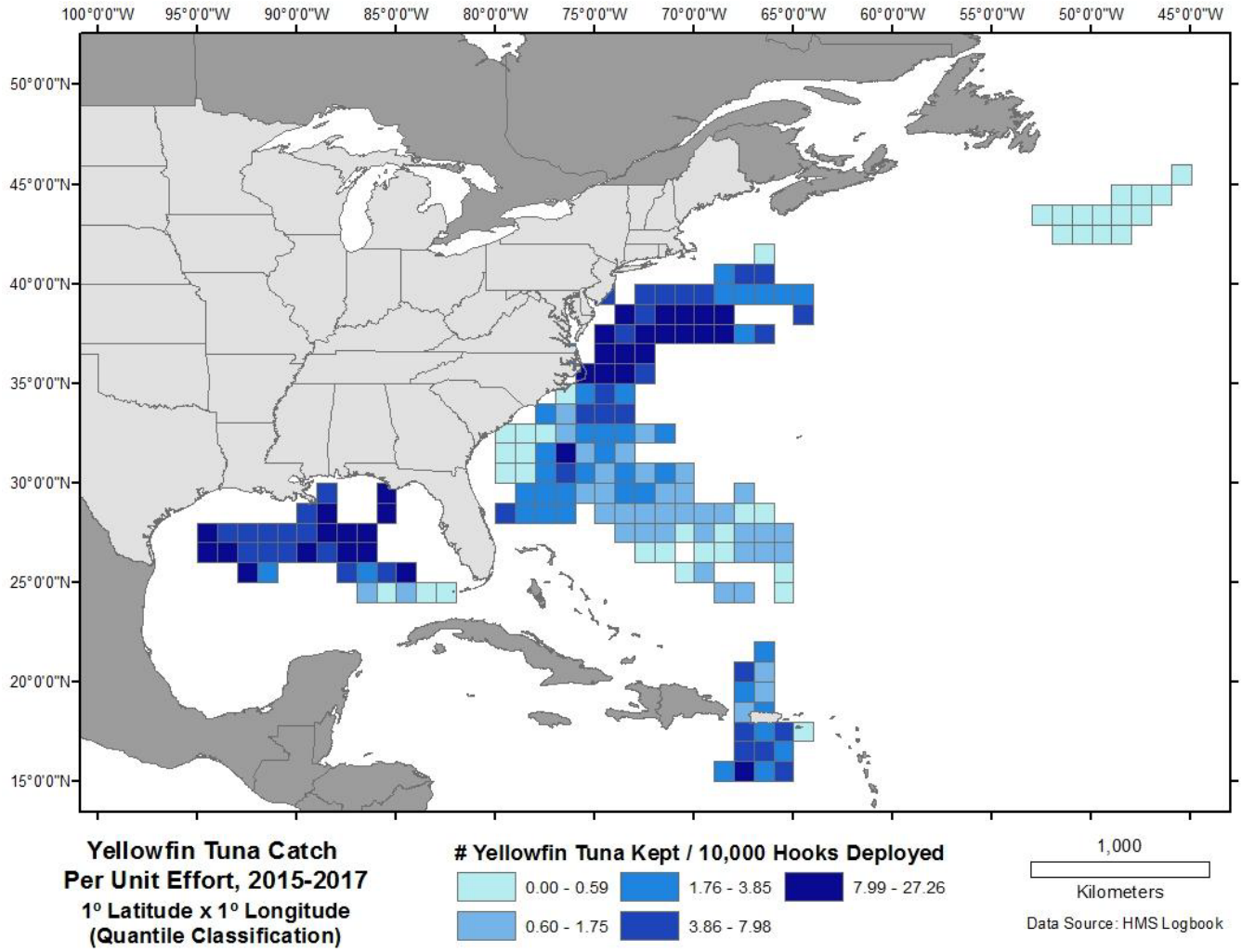

Figure 3.13 CPUE of Yellowfin Tuna (2015–2017)

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.

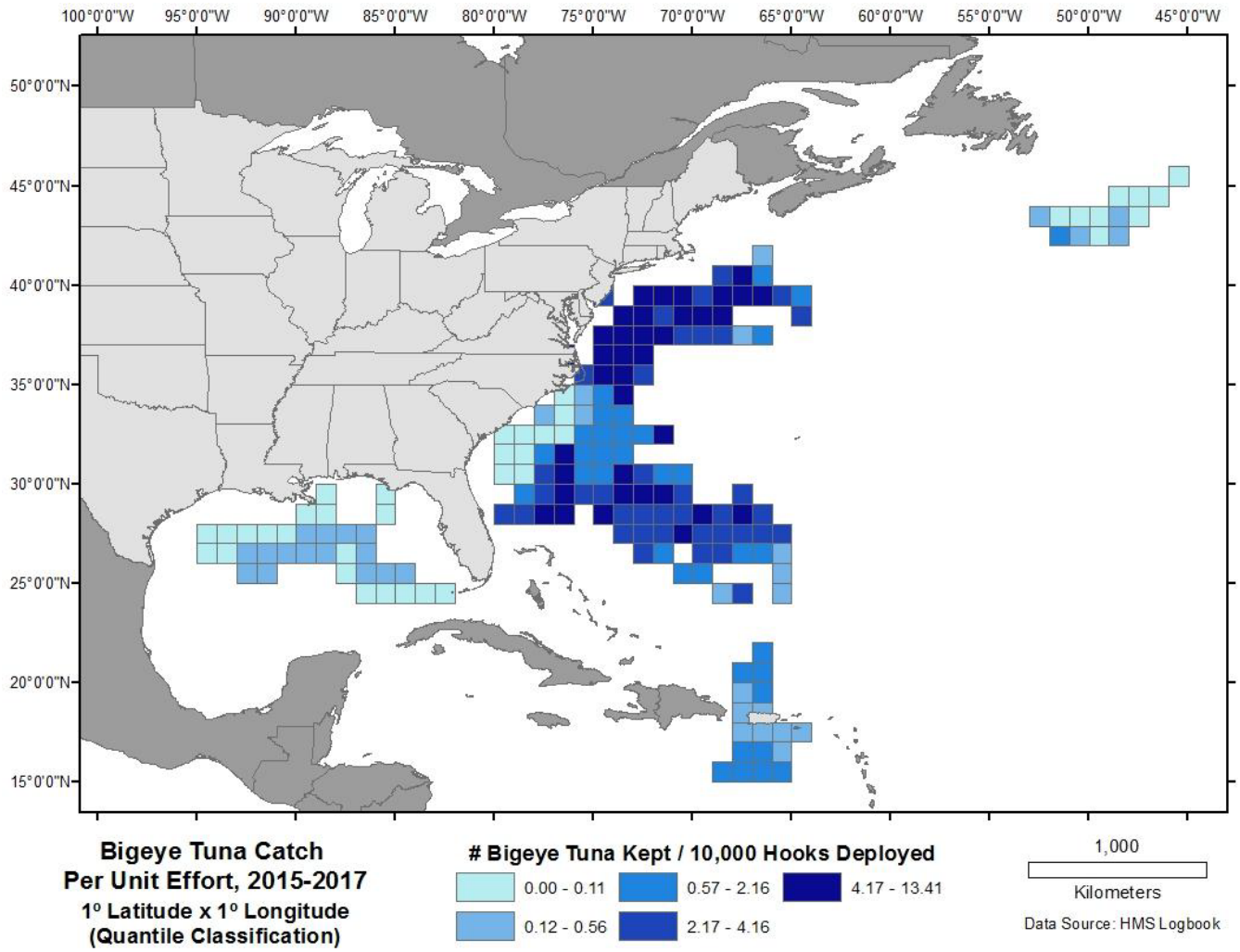

Figure 3.14 CPUE of Bigeye Tuna (2015–2017)

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.

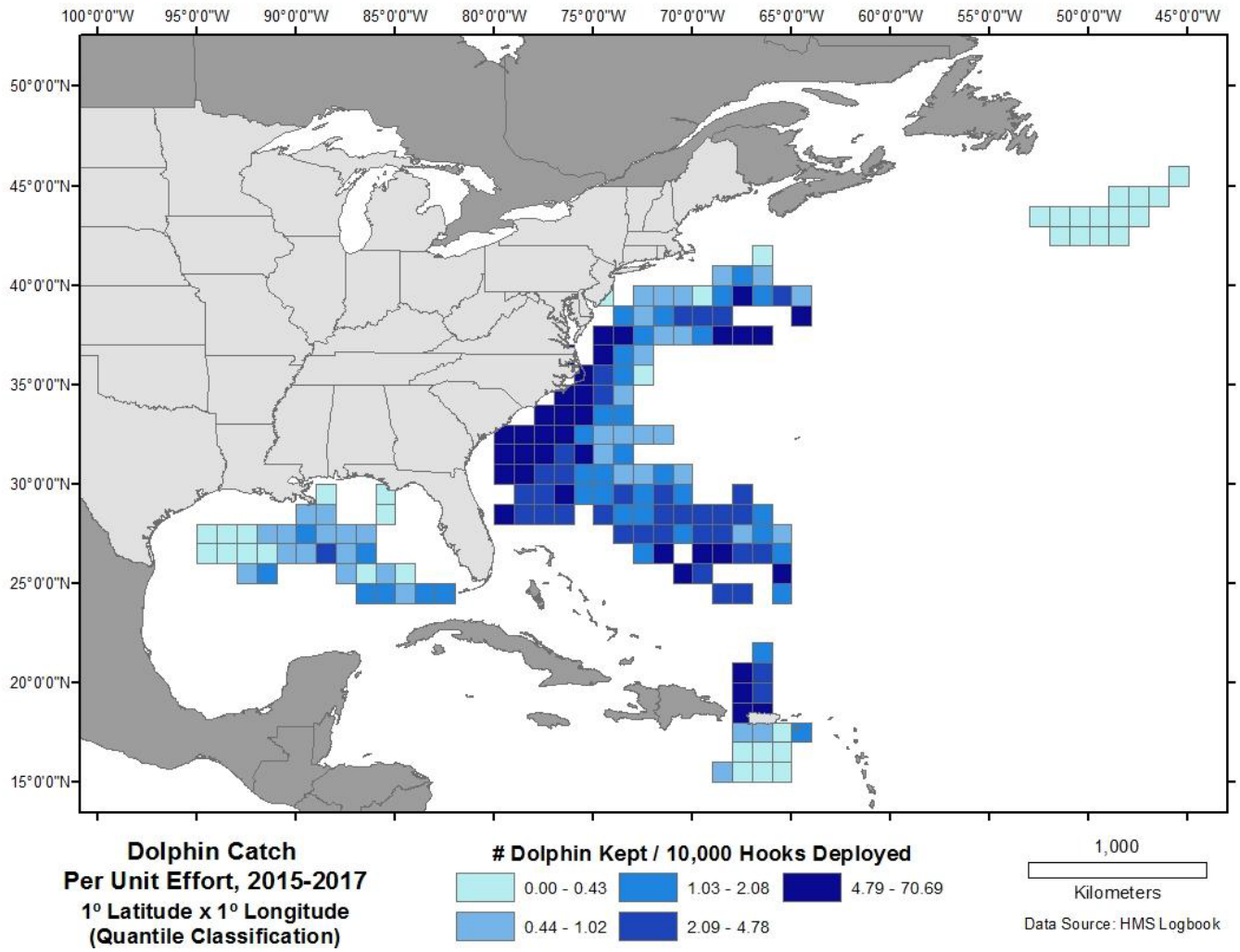

Figure 3.15 CPUE of Dolphinfish (*Coryphaena hippurus*) (2015–2017)

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	392	273	379	320	411	464
Bluefin tuna discarded	563	266	390	210	582	229
Bigeye, albacore, yellowfin, and skipjack tunas kept	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: HMS logbook data.

Table 3.8 Bluefin Interactions Across the Pelagic Longline Fleet (2012–2017)

Year	Vessels Deploying Pelagic Longline Gear	Vessels Reporting Bluefin Interactions	Percent with Interactions (%)	Percent without Interactions (%)
2012	122	94	77	23
2013	115	88	77	23
2014	110	92	84	16
2015	104	69	66	34
2016	85	66	78	22
2017	88	60	68	32

Source: HMS logbook data.

3.5.2.2 Pelagic Longline Closures and Gear Restricted Areas

Spatial distribution of pelagic longline target species catch-per-unit effort (catch per 10,000 hooks) are shown in Figure 3.11 to Figure 3.15; these maps show catch-per-unit effort averaged over 1º latitude x 1º longitude grid cells. 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 New England, Florida, and in the Sargasso Sea. Dolphin catch-per-unit effort hotspots occurred mainly within coastal regions of the South Atlantic Bight. 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.

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 incidental catch of bluefin by pelagic longline gear, while also minimizing the negative impact to targeted fishing activities. The Northeastern United States Closed Area is bounded by straight lines connecting the following coordinates, in the order given: 40°00' N. lat., 74°00' W. long.; 40°00' N. lat., 68°00' W. long.; 39°00' N. lat., 68°00' W. long.; 39°00' N. lat., 74°00' W. long. This area is closed to pelagic longline vessels during the month of June. Table 3.9 and Table 3.10 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 2015-2017, respectively. The number of bluefin discarded dead during the month of June decreased by 83 percent from 440 to 72. The grand total of dead bluefin (landings and dead discards) for 1996-1997 and 2015-2017, decreased from 694 to 342 (~ 51 percent reduction), respectively. Between 2015 and 2017, 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 3.16). 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 3.9 Northeastern U.S. Closed Area Bluefin Landings from 1996–1997

Time Period	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Dead Bluefin
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 3.10 Northeastern U.S. Reference Area*—Bluefin Landings from 2015–2017

Time Period	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Dead Bluefin
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	161	214	72	233
July	59	71	11	70
August	8	23	3	11
September	2	0	0	2
October	0	3	0	3
November	5	9	2	7
December	1	0	0	1
Grand total	239	336	103	342
2015 totals	38	74	10	48
2016 totals	155	213	91	246
2017 totals	46	49	2	48

*See boundaries as depicted by blue shaded box in Figure 4.2 of this DEIS.
Source: HMS logbook data.

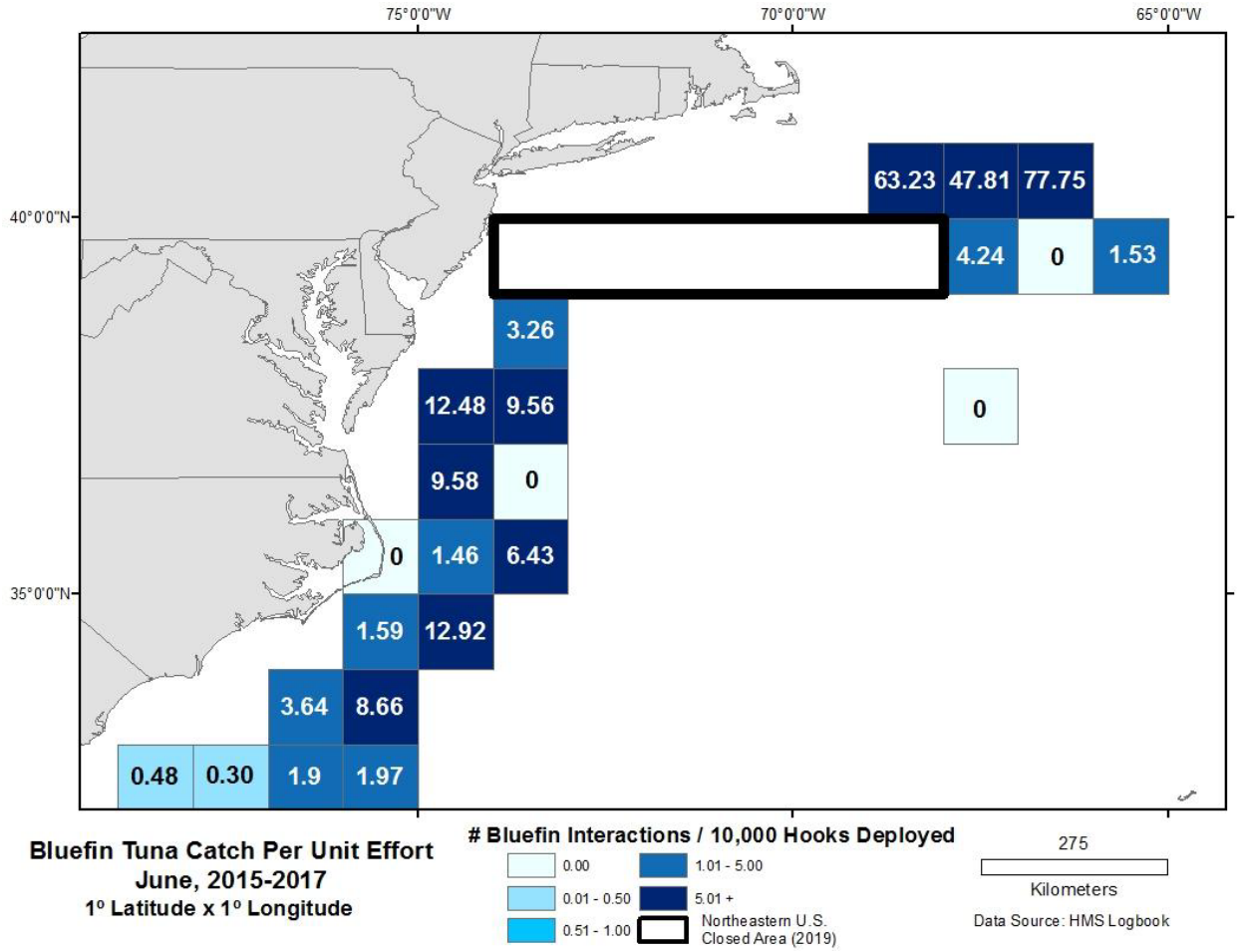

Figure 3.16 CPUE-Bluefin Interactions

Source: HMS logbook data.

Cape Hatteras Gear Restricted Area

As mentioned in §3.2.2.2, the Cape Hatteras Gear Restricted Area was implemented on January 1, 2015, in order to reduce incidental catch of bluefin by pelagic longline gear, while minimizing the negative impact to targeted fishing activities. Table 3.11 and Table 3.12 show the bluefin landings in the Cape Hatteras Gear Restricted Area from 2015-2017 and bluefin tuna interactions by disposition from 2006-2011, 2012-2014, and 2015-2017, respectively. The average annual number of dead bluefin for 2006-2011, 2012-2014, and 2015-2017, decreased from 110, to 13 to 2, respectively (a total reduction of 98 percent). Catch-per-unit effort in and around the Cape Hatteras Gear Restricted Area for the months of December-April (2015-2017) was very low compared to areas further northeast (Figure 3.17).

Table 3.11 Cape Hatteras Gear Restricted Area Bluefin Tuna Landings from 2015–2017

	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Bluefin Interactions
January	8	3	1	12
February	11	7	0	18
March	6	5	0	11
April	27	14	4	45
May	15	0	0	15
June	35	23	14	72
July	0	1	0	1
August	0	0	0	0
September	0	0	0	0
October	0	1	0	1
November	4	1	0	5
December	5	0	1	6
Grand total	111	55	20	186

Source: HMS logbook data.

Table 3.12 Cape Hatteras Gear Restricted Area Bluefin Tuna Interactions by Disposition and Time

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
2015–2017 average annual # bluefin	19	10	2	31
2015 totals	4	0	1	5
2016 totals	10	6	0	16
2017 totals	43	23	5	71

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

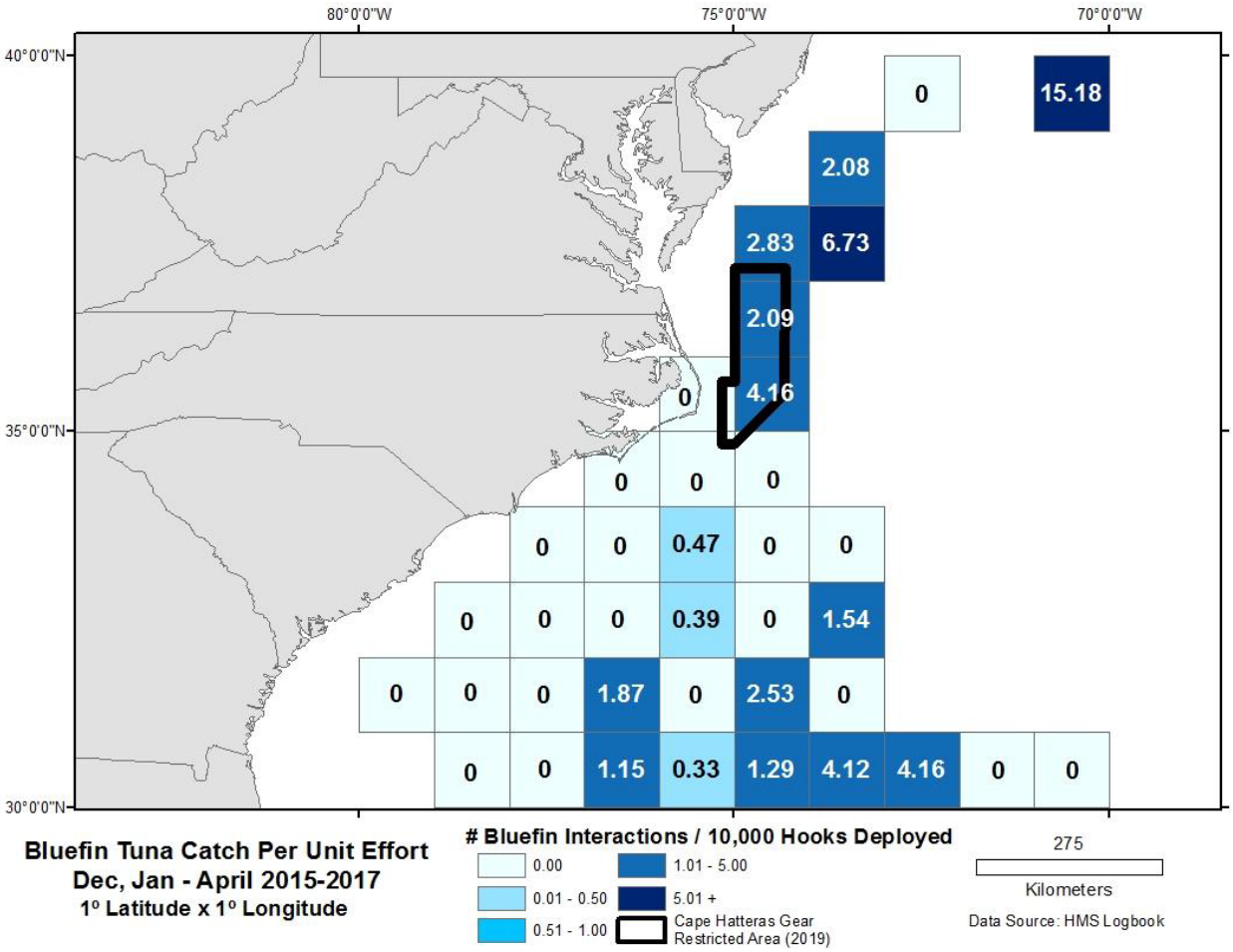

Figure 3.17 CPUE-All Bluefin Interactions

Source: HMS logbook data.

Gulf of Mexico Gear Restricted Area

As discussed in section 3.2.2.3, the Gulf of Mexico Gear Restricted Area was implemented on January 1, 2015, in order to reduce incidental catch of bluefin tuna by pelagic longline gear, while minimizing the negative impact to targeted fishing activities. The western Gulf of Mexico Gear Restricted Area is bounded by straight lines connecting the following coordinates, in the order given: 26°30' N. lat., 94°40' W. long.; 27°30' N. lat., 94°40' W. long.; 27°30' N. lat., 89°00' W. long.; 26°30' N. lat., 89°00' W. long; and the eastern Gulf of Mexico gear restricted area is bounded by straight lines connecting the following coordinates, in the order given: 27°40' N. lat., 88°00' W. long.; 28°00' N. lat., 88°00' W. long.; 28°00' N. lat., 86°00' W. long.; 27°40' N. lat., 86°00' W. long. This area is closed to pelagic longline vessels during the month of April through May. Table 3.13, Table 3.14 and Table 3.15 show the bluefin tuna interactions in the Gulf of Mexico pelagic longline gear restricted area by disposition from 2006-2012, and 2015-2017, and region-wide Gulf of Mexico from 2015-2017, respectively. The number of bluefin tuna discarded dead during the month of April and May decreased from 323 to 0 (a 100 percent reduction). Total bluefin tuna interactions for 2006-2012 and 2015-2017 in the GRA decreased from 1,105 to 71 (~ a 94 percent reduction), respectively. Total Gulf of Mexico region bluefin tuna interactions decreased from 1,105 to 198 across historical (2006-2012) and recent (2015-2017) time periods (~ an 82 percent reduction).

Catch-per-unit effort in April and May (2015-2017) was relatively low in areas surrounding the Gulf of Mexico Gear Restricted Area (i.e., 1-2 fish per 10,000 hooks) (Figure 3.18).

Table 3.13 Bluefin Interactions Reported in the HMS Logbook by Month in the Spring Gulf of Mexico Gear Restricted Area (2006–2012)

Month	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total
January	38	4	3	45
February	62	13	15	90
March	64	48	46	158
April	76	147	151	374
May	79	87	172	338
June	14	21	30	65
July	0	0	0	0
August	0	0	0	0
September	0	0	1	1
October	13	1	2	16
November	6	0	0	6
December	12	0	0	12
Total	364	321	420	1,105

Source: HMS logbook data.

Table 3.14 Bluefin Interactions Reported in the HMS logbook by Month in the Spring Gulf of Mexico Gear Restricted Area (2015–2017)

	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Bluefin
January	7	3	1	11
February	5	2	4	11
March	11	13	12	36
April	0	0	0	0
May	0	0	0	0
June	0	5	4	9
July	1	2	0	3
August	0	0	0	0
September	0	0	0	0
October	0	0	0	0
November	0	0	1	1
December	0	0	0	0
Grand total	24	25	22	71

Source: HMS logbook data.

Table 3.15 Gulf of Mexico (Region-Wide) Bluefin Landings from 2015–2017

	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Total Sum of Bluefin
January	8	3	3	14
February	6	2	4	12
March	14	15	15	44
April	5	11	7	23
May	6	21	9	36
June	11	27	13	51
July	4	7	1	12
August	0	0	0	0
September	0	1	0	1
October	0	0	0	0
November	0	1	1	2
December	0	1	2	3
Grand total	54	89	55	198

Source: HMS logbook data.

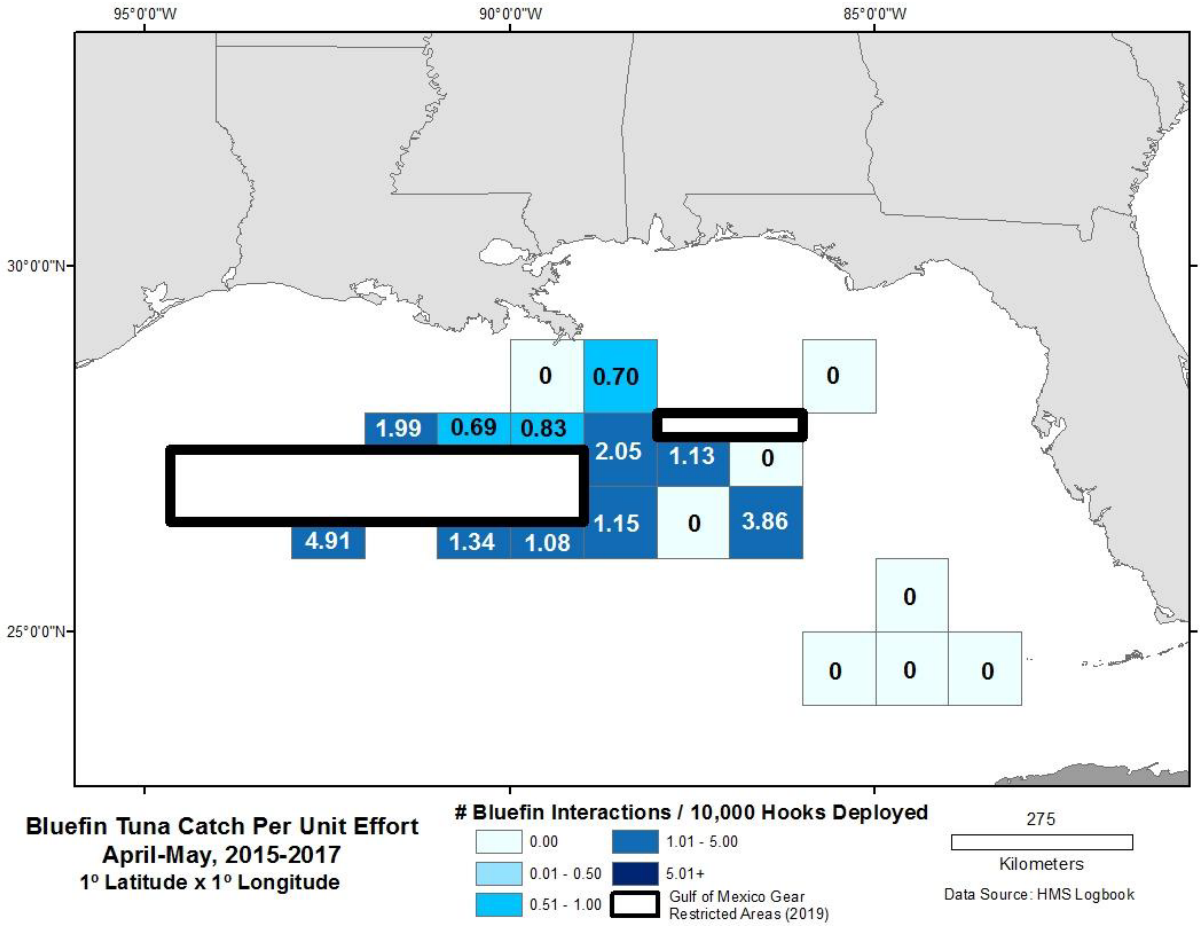

Figure 3.18 CPUE-Gulf of Mexico Total Bluefin Interactions

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 (PS), 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 as incidental bycatch, 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 bycatch. 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. For additional information, please refer to the Draft Individual Bluefin Tuna (IBQ) Program Three-Year Review.

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

NOAA Fisheries 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 distributions to shareholders. For each year since Amendment 7 was implemented, NOAA Fisheries has transferred quota into the Longline category inseason in order 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.

NOAA Fisheries 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 NOAA Fisheries 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 3.16 includes data on the annual (January 1), inseason, and combined (total) distributions of IBQ by shareholder tier.

Table 3.16 IBQ Allocations (t) to the Pelagic Longline Category by Share Tier (lb) in 2015–2018

				IBQ (lb) to Each Eligible Shareholder*		
	Quota Distribution	IBQ (t)	Date	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).

Table 3.17 summarizes various IBQ Program metrics regarding allocation, catch, fishing effort, leasing of IBQ, and reporting and monitoring.

Table 3.17 Bluefin Catch and Other Metrics of the IBQ Program (2015–2017)

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

*NED = northeast distant area (See Figure 3.30).

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 2017, 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). Bluefin tuna dealer reports are maintained in the Commercial Bluefin Tuna Landings Database, also known as the electronic bluefin tuna landings database (eBFT).

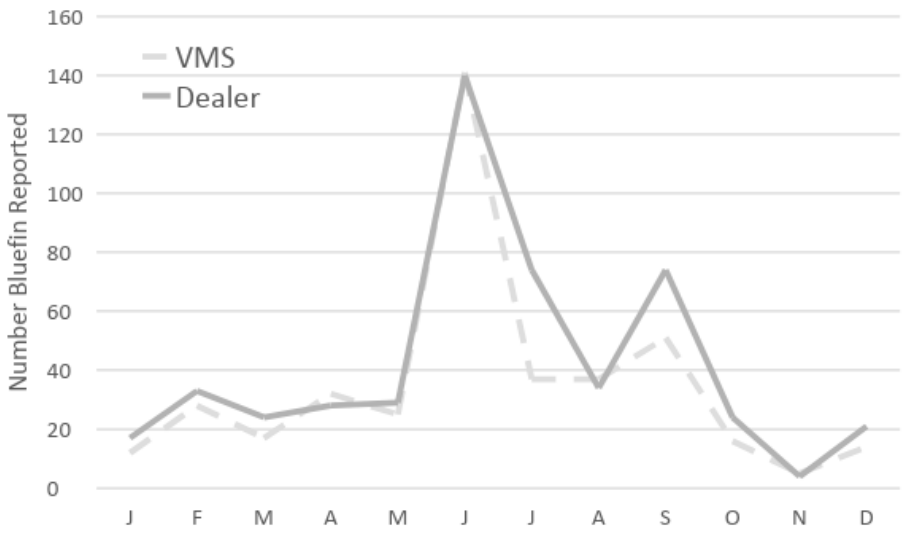

Figure 3.19 Number of Bluefin Tuna Reported Retained (VMS) vs. Number Landed (Dealer Data) in 2017 (Jan–Dec, 2017)

Sources: VMS; eBFT (dealer data).

Preliminary analyses presented in the Draft Three-Year Review of the IBQ Program imply that the IBQ Program may have been successful in achieving its five objectives:

- Based on a review of the landings and dead discards during the IBQ period, the IBQ Program may be 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 Draft 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 interactions 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 Draft Three-Year Review suggests that the IBQ Program also provided flexibility in the quota system to enable pelagic longline vessels to obtain bluefin tuna quota from other vessels with available IBQ in order to enable full accounting for bluefin tuna landings and dead discards, and minimize constraints on fishing for target species.
- The Draft Three-Year Review suggests 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 Draft Three-Year Review stated that it was difficult to separate 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. The reduction in fishing effort during 2015 compared to 2014 may have been due to uncertainty regarding the new IBQ Program, as well as the factors driving the long-term reduction in fishing effort.
- Analysis presented in the Draft Three-Year Review imply 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 Atlantic 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. Information on top HMS ports from 2015 through 2017 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 2017 and varied by $0.78, $0.18, and $0.47 per pound, respectively (Table 3.18). Total landings for bluefin and yellowfin tunas have generally increased (with some variability) since 2015, however landings of swordfish decreased by ~ 556,000 lb between 2015 and 2017. 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 Grand Banks of Newfoundland (i.e., the NED fishery), 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 Chapter 6 of the most recent HMS SAFE Report.

Table 3.18 Average Target Species Ex-Vessel Prices, and Overall Ex-Vessel Revenue (2013–2017)

Species	Year	Annual Landings (lb dw)	Average Ex-Vessel Price	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
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
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

Sources: HMS eDealer database, NMFS 2019.

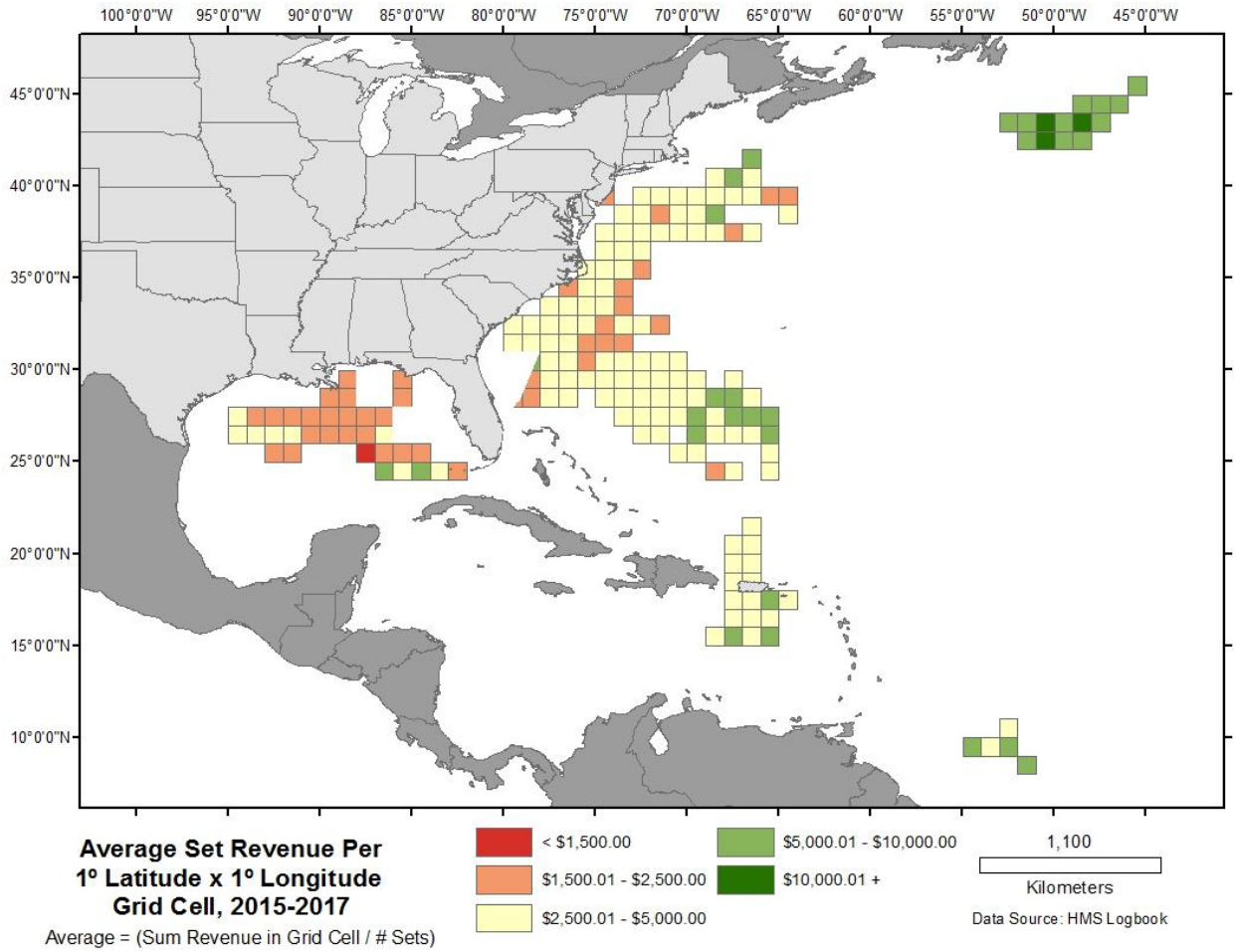

Figure 3.20 Average Pelagic Longline Set Revenue (2015–2017) by One Degree Grids

Source: HMS logbook data.

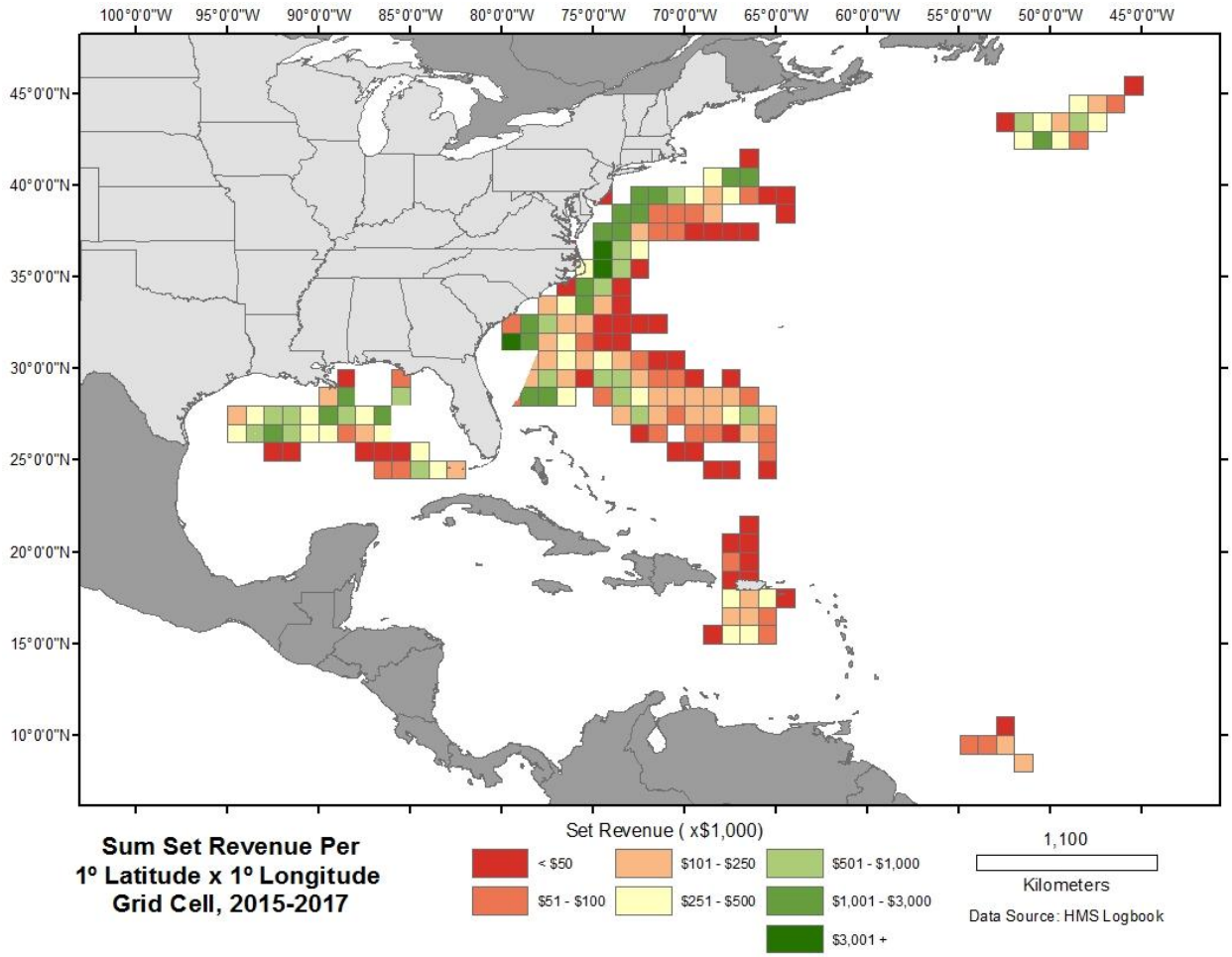

Figure 3.21 Sum of Set Revenue (2015–2017) by One Degree Grids

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 2018 HMS SAFE Report provides additional information on species protected under the Marine Mammal Protection Act, Endangered Species Act, and 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 2018 HMS SAFE Report (e.g., observer coverage).

In order 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 miles 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 3.19 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 3.19 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 vessel monitoring systems. 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 3.8), and for specific spatially managed areas (e.g., Sections 3.5.2.2.1-Section 3.5.2.2.3). Information about Atlantic HMS bycatch since implementation of Amendment 7 measures are shown in Table 3.20. 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 3.20). 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 = 2010 fish) and 2017 (n = 219 fish); however, the increase in bluefin tuna reported discards in 2016 is notable (n = 582) (see Table 3.17 for IBQ and pelagic longline fishing trends such as number of hooks and sets deployed occurring currently with this bycatch). 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 were mapped 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 3.22).
- 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 3.23).
- Dusky shark discard catch-per-unit effort (11.81 to 70.05 sharks per 10,000 hooks) was high in the South Atlantic Bight between North Carolina and Central Florida, off the West Florida shelf, and in the U.S. Caribbean (Figure 3.24).
- Blue marlin discard catch-per-unit effort was highest along the U.S. east coast continental shelf break, off the west Florida shelf, and in the U.S. Caribbean (Figure 3.25).
- White marlin discard catch-per-unit effort was highest along the U.S. east coast continental shelf, at fishing locations seaward of the Bahamian EEZ, and in the U.S. Caribbean (Figure 3.26).
- Roundscale spearfish discard catch-per-unit effort was highest at fishing locations seaward of the Bahamian EEZ, and in the U.S. Caribbean (Figure 3.27).
- Sailfish discard catch-per-unit effort was highest in the South Atlantic Bight and in the Gulf of Mexico (Figure 3.28).
- Shortfin mako discards were highest off Georges Bank and the Grand Banks (Figure 3.29).

Table 3.20 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.

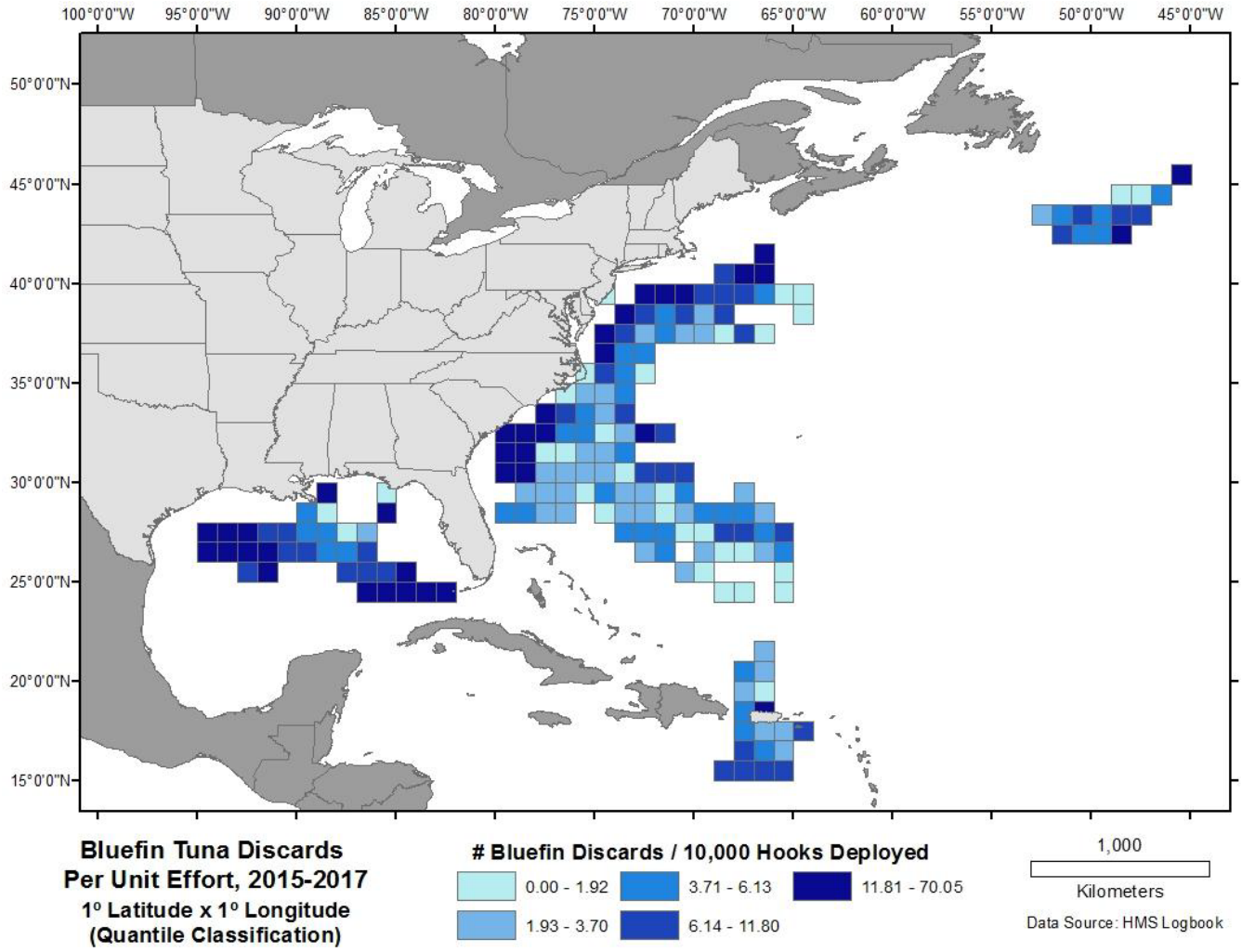

Figure 3.22 Spatial Distribution of Bluefin Discards within the Pelagic Longline Fishery

Source: HMS logbook data.

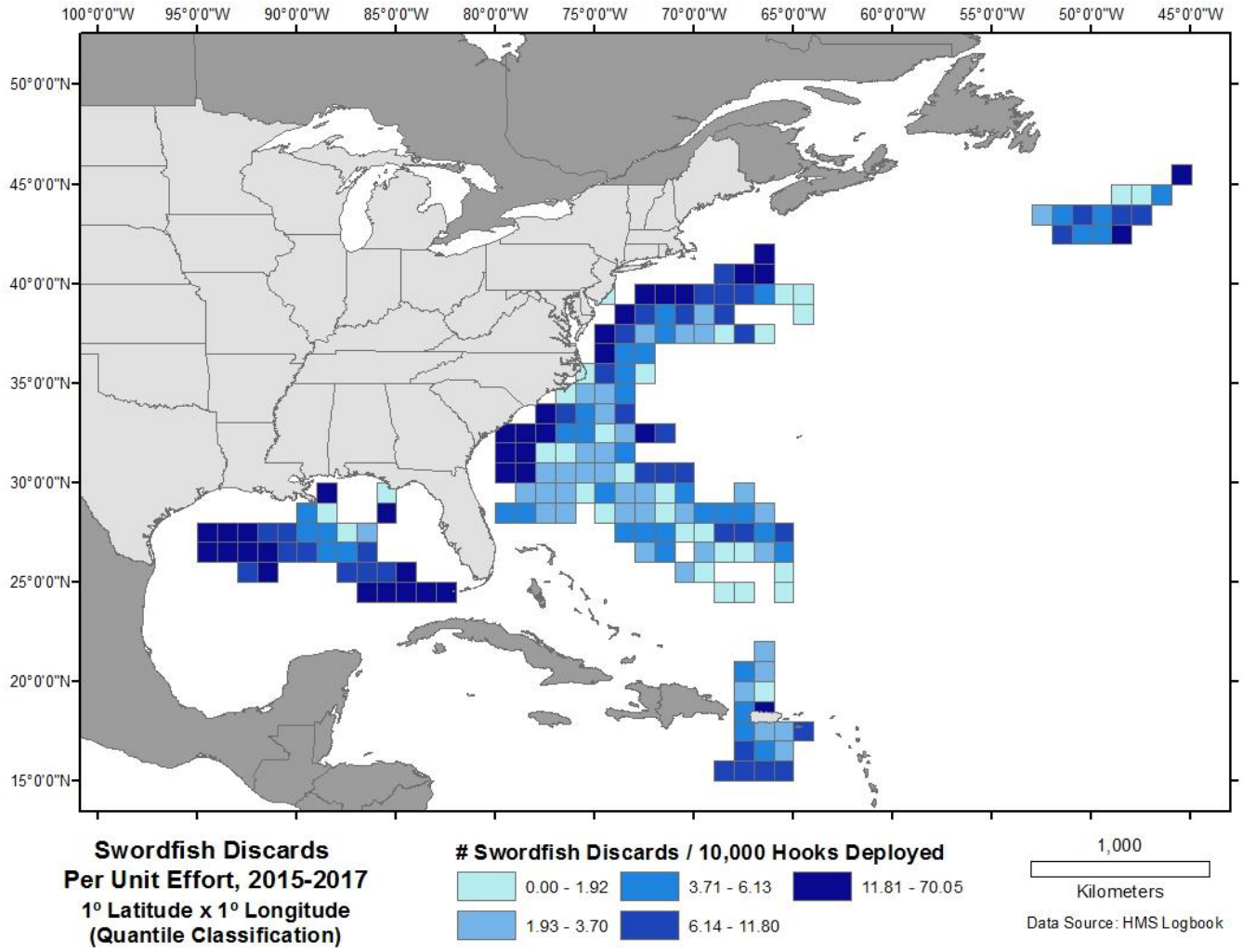

Figure 3.23 Spatial Distribution of Swordfish Discards within the Pelagic Longline Fishery

Source: HMS logbook data.

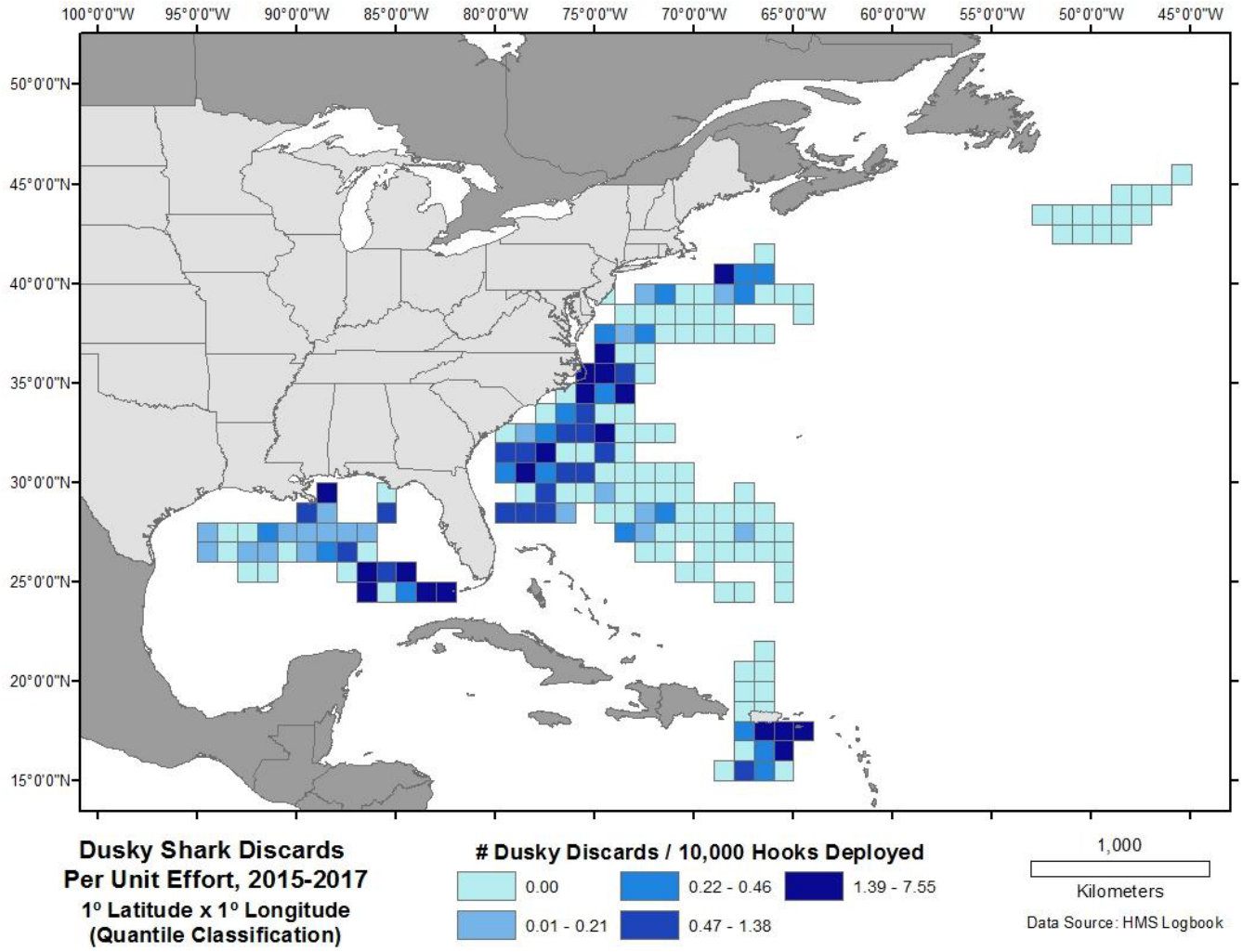

Figure 3.24 Spatial Distribution of Dusky Shark Discards within the Pelagic Longline Fishery

Source: HMS logbook data.

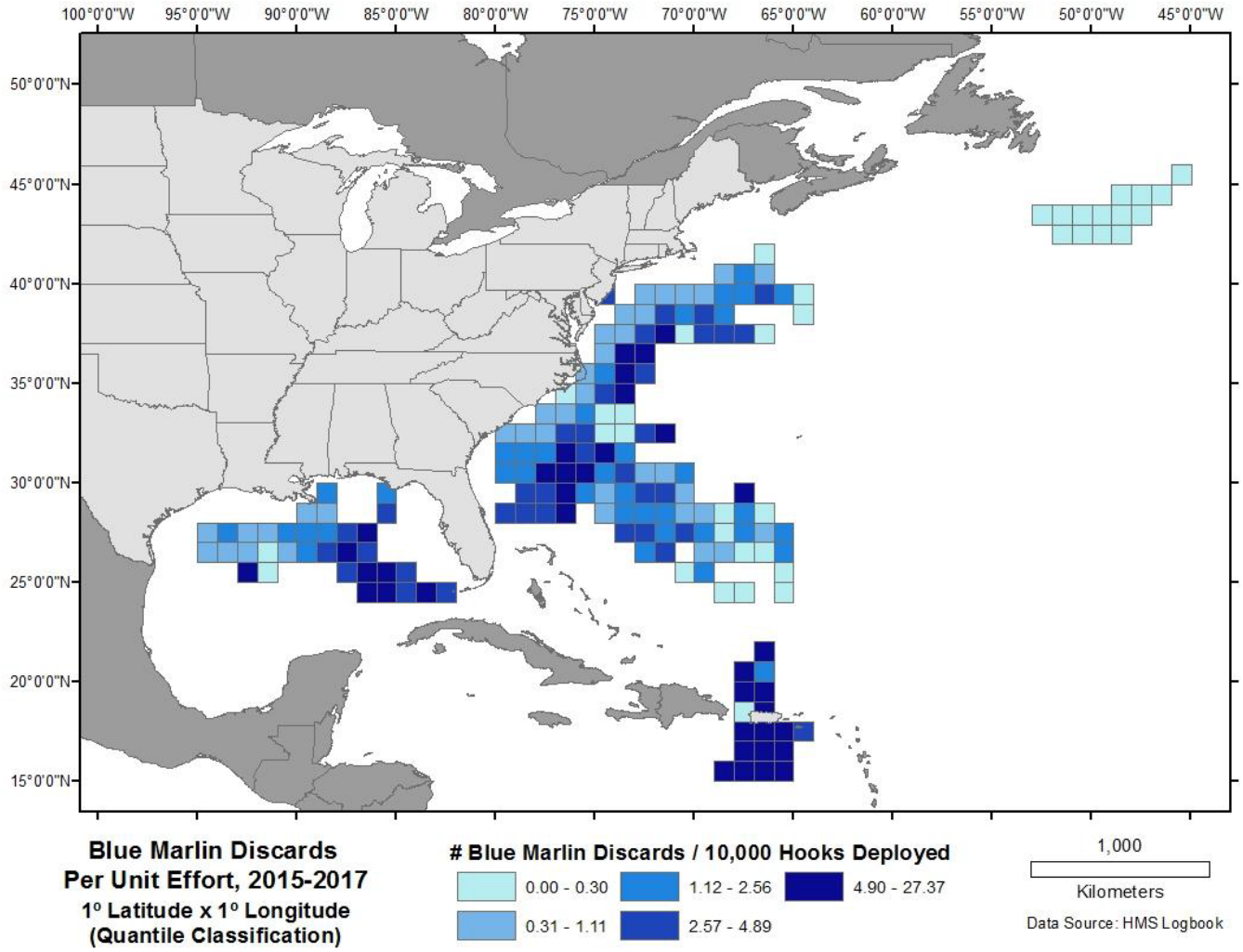

Figure 3.25 Spatial Distribution of Blue Marlin Discards within the Pelagic Longline Fishery

Source: HMS logbook data.

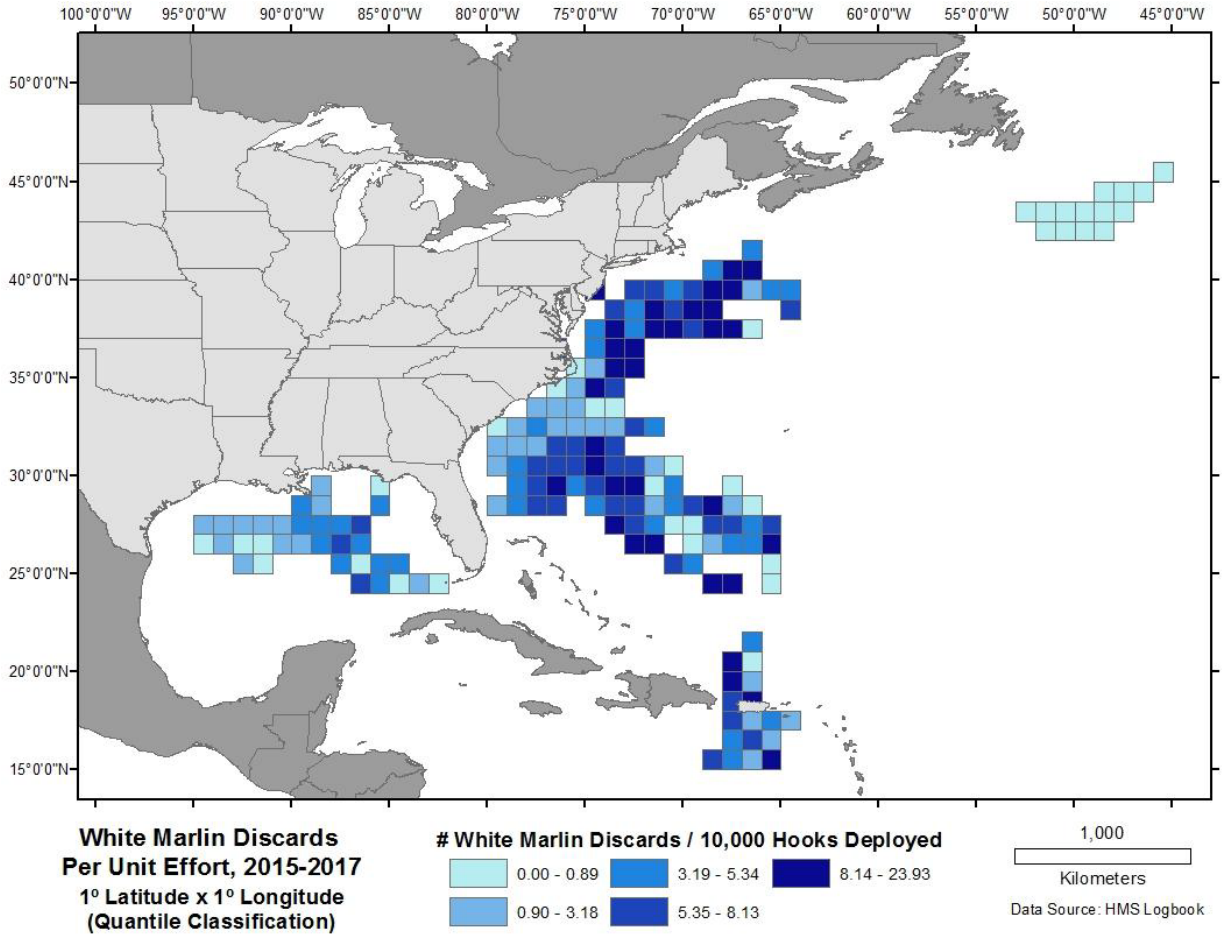

Figure 3.26 Spatial Distribution of White Marlin Discards within the Pelagic Longline Fishery

Source: HMS logbook data.

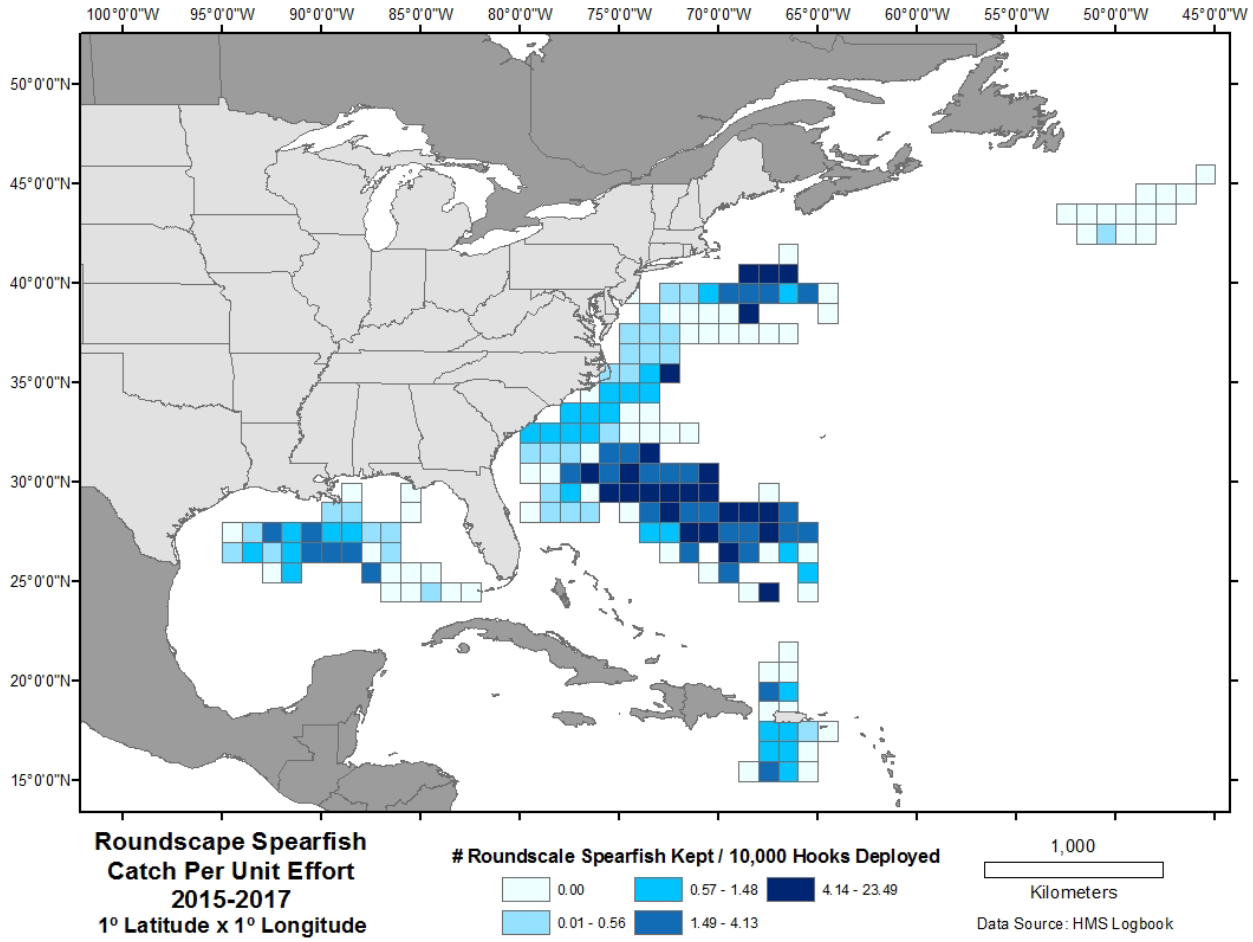

Figure 3.27 Spatial Distribution of Roundscale Spearfish Discards within the Pelagic Longline Fishery

Source: HMS logbook data.

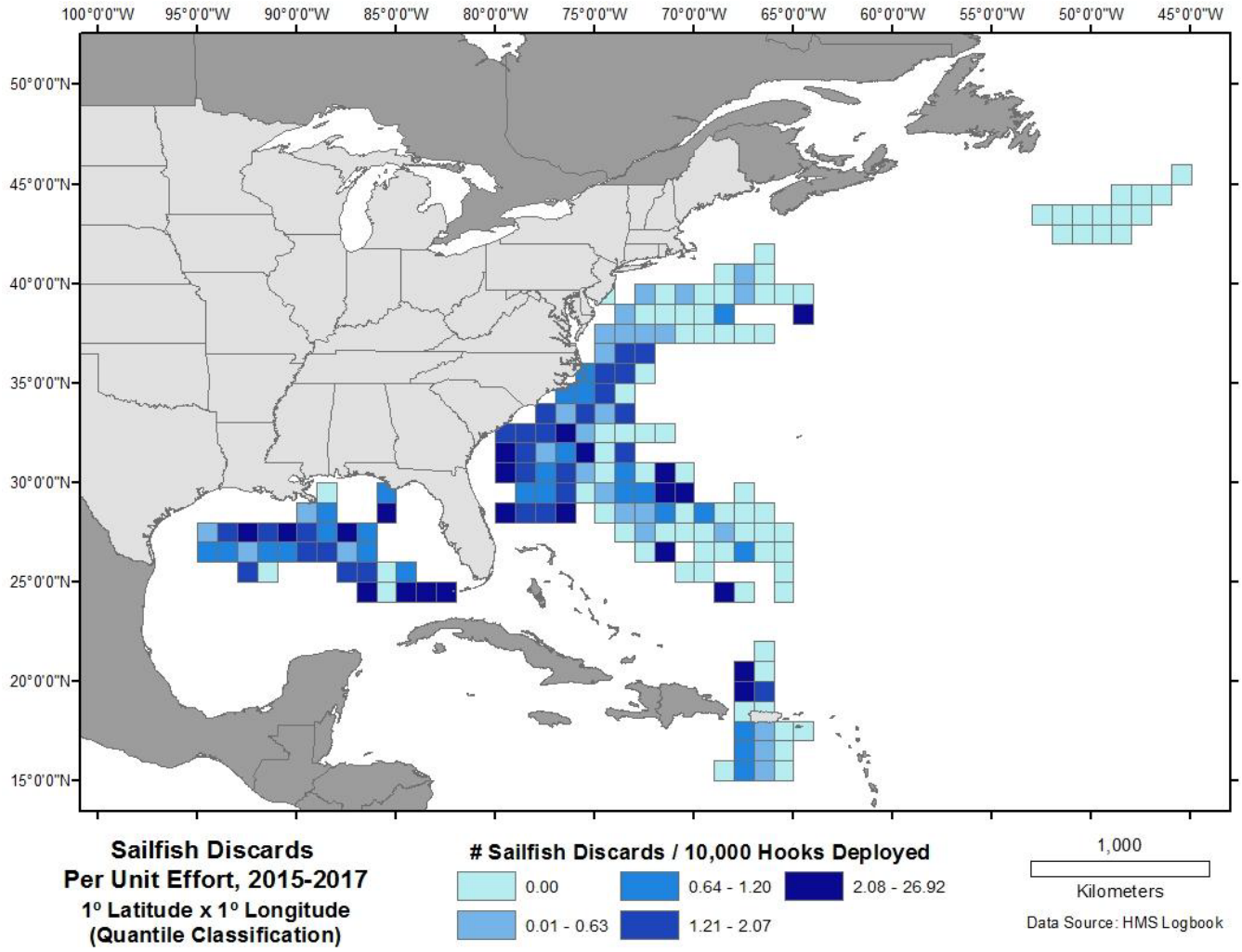

Figure 3.28 Spatial Distribution of Sailfish Discards within the Pelagic Longline Fishery

Source: HMS logbook data.

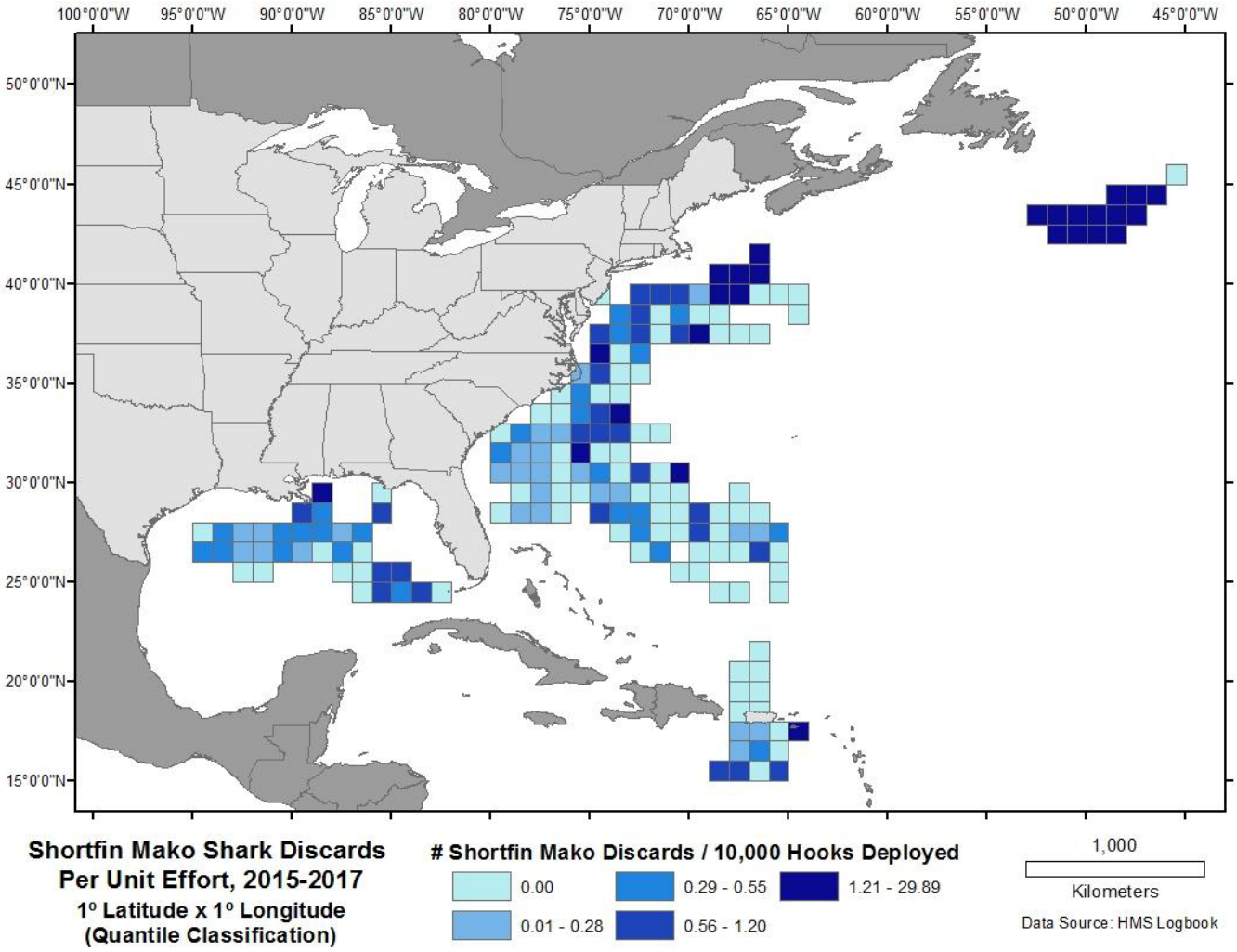

Figure 3.29 Spatial Distribution of Shortfin Mako Discards within the Pelagic Longline Fishery

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 3.21.

Table 3.21 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*		

Under MMPA requirements, NMFS produces an annual list of fisheries (LOF) that classifies domestic commercial fisheries, by gear type, relative to their rates of incidental mortality or serious injury of marine mammals. The LOF includes three classifications:

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 final 2018 MMPA LOF was published on February 7, 2018 (83 FR 5349). The Atlantic Ocean, Caribbean, and Gulf of Mexico large pelagic longline fishery is classified as Category I (frequent serious injuries and mortalities incidental to commercial fishing). 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 3.22. 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). NOAA Fisheries monitors observed interactions with sea turtles and marine mammals on a quarterly basis and reviews data for appropriate action, as necessary.

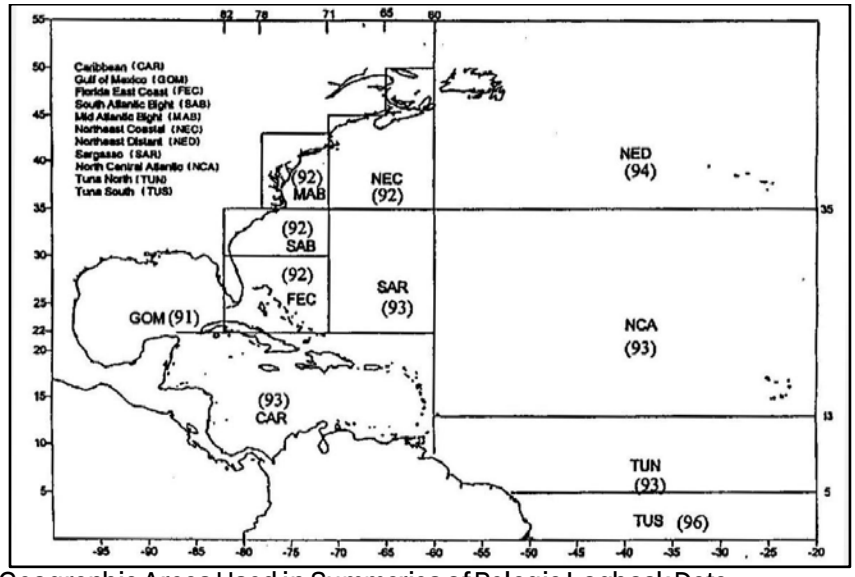

Figure 3.30 Geographic Areas Used in Summaries of Pelagic Logbook Data

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 3.22 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 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.

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 proposed 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 sea turtle management, a summary of ESA consultation history, and a review of regulations for the pelagic longline fishery is available in the HMS SAFE Report.

Protected Species-Sea Turtles

As a result of increased sea turtle interactions in 2001 and 2002, NOAA Fisheries reinitiated consultation for the pelagic longline fishery and completed a new Biological Opinion 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 Biological Opinion 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 3.22). 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 3.31). The grid cell in Figure 3.31 that had the highest number of interactions per unit effort reflects 3 leatherback and 4 loggerhead interactions that occurred over 10 sets deployed (~8,365 hooks). 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 Biological Opinion for both loggerheads and leatherbacks (Table 3.23). NOAA Fisheries monitors observed interactions with sea turtles and marine mammals on a quarterly basis and reviews data for additional appropriate action, as necessary.

Table 3.23 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.

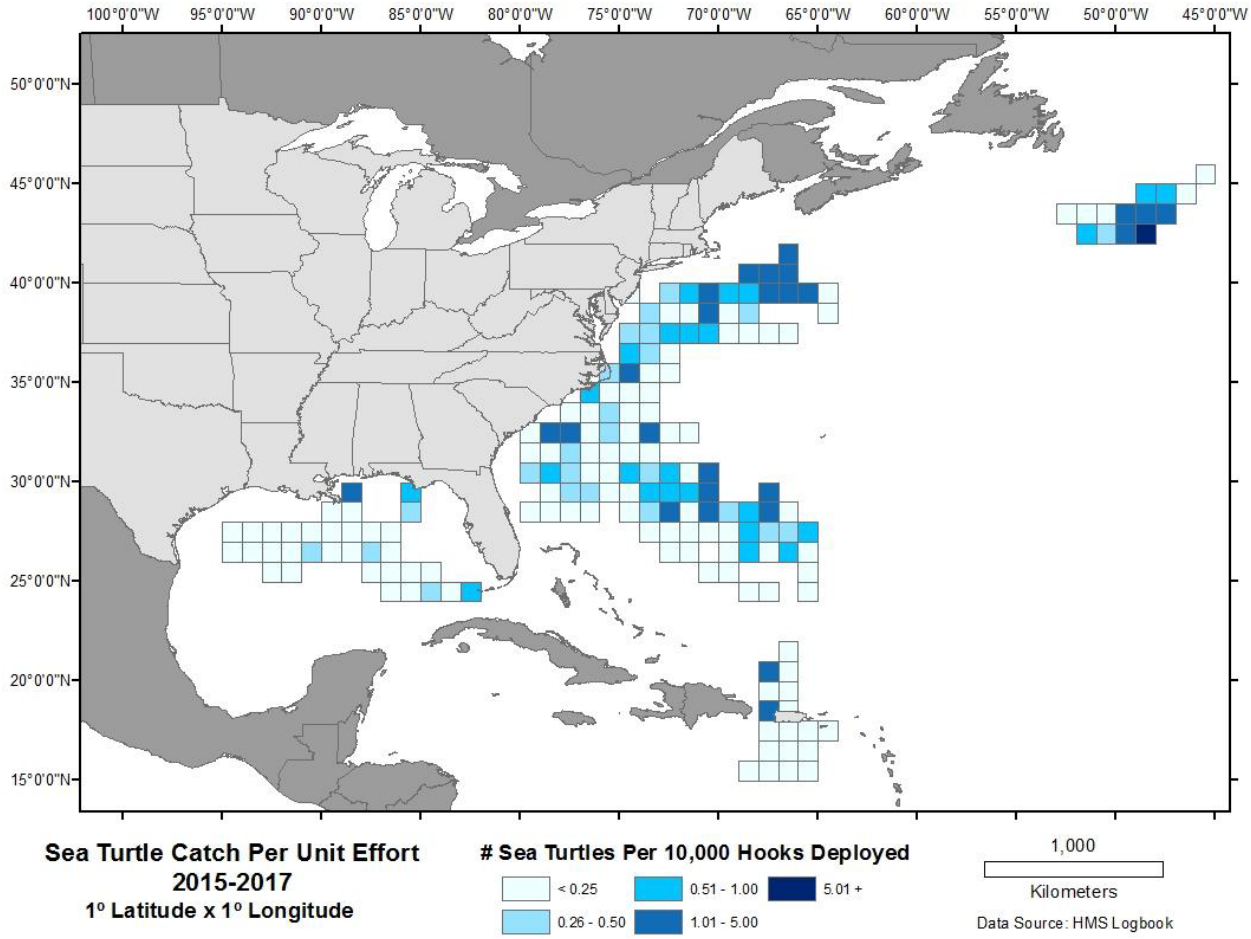

Figure 3.31 Spatial Distribution of Sea Turtle CPUE within the U.S. Pelagic Longline Fishery

Source: HMS logbook data.

3.7.6 Interactions with Seabirds

Gannets, gulls, greater shearwaters, and storm petrels are occasionally hooked by Atlantic pelagic longline gear. These species and all other seabirds are protected under the Migratory Bird Treaty Act. 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.

3.8 References

Angliss, R.P. and D.P. DeMaster. 1998. Differentiating serious and non-serious injury of marine mammals taken incidental to commercial fishing operations. NOAA Technical Memorandum NMFS OPR-13: 48 p.

Aranda G, Abascal FJ, Varela JL, and A. Medina. 2013. Spawning behavior and post-spawning migration patterns of Atlantic Bluefin Tuna (Thunnus thynnus) ascertained from satellite archival tags. PLoS ONE. 8(10): e76445.

Arocha, F. 1997. The reproductive dynamics of swordfish Xiphias gladius L. and management implications in the northwestern Atlantic. University of Miami, Ph.D. Dissertation. Coral Gables, FL. 383 p.

Beerkircher, L. R., Cortés E., and M. Shivji. 2002. Characteristics of shark bycatch observed on pelagic longlines off the southeastern United States, 1992–2000. Mar. Fish. Rev. 64:40–49.

Block B.A., Teo S.L.H., Walli A., Boustany A., Stokesbury M.J.W., Farwell C.J., Weng K.C., Dewar H., and T.D. Williams. 2005. Electronic tagging and population structure of Atlantic bluefin tuna. Nature. 434: 1121-1127.

Butler C.M., Rudershausen PJ, Buckel JA. 2010. Feeding ecology of Atlantic bluefin tuna (Thunnus thynnus) in North Carolina: diet, daily ration, and consumption of Atlantic menhaden (Brevoortia tyrannus). Fish Bull. 108: 56-69.

Byrne, M.E., E. Cortes, J.J. Vaudo, G.C.M. Harvey, M. Sampson, B.M. Wetherbee, and M. Shivji. 2017. Satellite telemetry reveals higher fishing mortality rates than previously estimated, suggesting overfishing of an apex marine predator. Proceedings of the Royal Society B 284: 20170658.

Cramer, J. and H. Adams. 2000. Large pelagic logbook newsletter: 1998. NOAA Technical Memorandum. NMFS-SEFSC-433. 25 p.

Dragovich, A. 1969. Review of studies of tuna food in the Atlantic Ocean. U. S. Fish wildl. Serv.Spec. Sci. Rep.-Fish. 593:21 p.

Druon JN, Fromentin JM, Hanke AR, Arrizabalaga H, Damalas D, Tičina V, Quílez-Badia G, Ramirez K, Arregui I, Tserpes G, Reglero P. 2016. Habitat suitability of the Atlantic bluefin tuna by size class: An ecological niche approach. Progress in Oceanography. 2016 Mar 31;142:30-46.

Evans K, Patterson TA, Reid H, Harley SJ. 2012. Reproductive schedules in Southern bluefin tuna: are current assumptions appropriate? PLoS ONE 7(4): e34550. doi: 10.1371/journal.pone.0034550.

Fairfield-Walsh, C., and L. P. Garrison. 2006. Estimated bycatch of marine mammals and turtles in the U.S. Atlantic pelagic longline fleet during 2005. NOAA Tech Memo. NMFS-SEFSC-539, 52 p.

Fromentin JM, Reygondeau G, Bonhommeau SG, Beaugrand G. 2013. Oceanographic changes and exploitation drive the spatio-temporal dynamics of Atlantic bluefin tuna. Fish Oceanogr. 23(2): 147-156.

Fromentin JM. 2010. Atlantic bluefin tuna. In: International Commission for the Conservation of Atlantic Tunas (ICCAT). 2006-2009. ICCAT Manual. International Commission for the Conservation of Atlantic Tuna. p. 93-111. http://www.iccat.int/en/ICCATManual.htm

Fromentin and Powers 2005??

Galuardi B and Lutcavage M. 2012. Dispersal routes and habitat utilization of juvenile Atlantic bluefin tuna, Thunnus thynnus, tracked with mini PSAT and archival tags. PLoS ONE 7(5): e37829. doi:10.1371/journal.pone.0037829.

Galuardi B, Royer F, Golet W, Logan J, Neilson J, Lutcavage M. 2010. Complex migration routes of Atlantic bluefin tuna (Thunnus thynnus) question current population structure paradigm. Can J Fish Aquat Sci. 67: 966-976.

Garrison 2005??

Garrison, L.P. and L. Stokes. 2012. Estimated bycatch of marine mammals and sea turtles in the U.S. Atlantic pelagic longline fleet during 2011. NOAA Technical Memorandum NMFS-SEFSC-632, 61 p.

Garrison, L.P and Stokes, L. 2013. Estimated bycatch of marine mammals and sea turtles in the U.S. Atlantic pelagic longline fleet during 2012. NOAA Technical Memorandum NOAA NMFS-SEFSC-655: 62 p.

Garrison, L.P and L. Stokes. 2014. Estimated bycatch of marine mammals and sea turtles in the U.S. Atlantic pelagic longline fleet during 2013. NOAA Technical Memorandum NMFS-SEFSC-667: 61 p.

Garrison 2015?

Garrison, L.P. and L. Stokes. 2016. Estimated Bycatch of Marine Mammals and Sea Turtles in the US Atlantic Pelagic Longline Fleet during 2015. NOAA Technical Memorandum NOAA NMFS-SEFSC-709: 61p

Gibson AJA and Campana SE. 2005. Status and recovery potential of porbeagle shark in the Northwest Atlantic. Canadian Science Advisory Secretariat, Research Document 2005/053. http://www.dfo-mpo.gc.ca/csas-sccs/publications/resdocs-docrech/2005/2005_053-eng.htm

Golet WJ, Cooper AB, Campell R, Lutcavage M. 2007. Decline in condition of northern bluefin tuna (Thunnus thynnus) in the Gulf of Maine. Fish Bull. 105: 390-395.

Golet WJ, Galuardi B, Cooper AB, Lutcavage ME. 2013. Changes in the Distribution of Atlantic bluefin tuna (Thunnus thynnus) in the Gulf of Maine 1979-2005. PLoS ONE 8(9): e75480. doi:10.1371/journal.pone.0075480.

Hayes CG, Jiao Y, Cortés E. 2009. Stock assessment of scalloped hammerheads in the Western North Atlantic Ocean and Gulf of Mexico. North American Journal of Fisheries Management 29:1406-1417.

Heinisch G, Rosenfeld H, Knapp JM, Gordin H, Lutcavage ME. 2014. Sexual maturity in western Atlantic bluefin tuna. Sci Rep 4:7205. doi:10.1038/srep07205.

Hutt, C., S. Lovell, and G. Silva. 2014. The Economic Contributions of Atlantic Highly Migratory Species Anglers in New England and the Mid-Atlantic, 2011. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-F/SPO-147, 34 p.

Lawson GL, Castleton MR, Block BA. 2010. Movements and diving behavior of Atlantic bluefin tuna Thunnus thynnus in relation to water column structure in the northwestern Atlantic. Mar Ecol Prog Ser. 400: 245-265.

Logan JM, Rodriguez-Marin E, Goni N, Barreiro S, Arrizabalaga H, Golet W, Lutcavage M. 2011. Diet of young Atlantic bluefin tuna (Thunnus thynnus) in eastern and western Atlantic foraging grounds. Mar Biol. 158: 73-85. 121

Lutcavage ME, Galuardi B, Lam TC. 2012. Predicting potential Atlantic spawning grounds of Western Atlantic bluefin tuna based on electronic tagging results 2002-2011. ICCAT SCRS/2012/157. 7 p.

Muhling BA, Lamkin JT, Roffer MA. 2010. Predicting the occurrence of Atlantic bluefin tuna (Thunnus thynnus) larvae in the northern Gulf of Mexico: building a classification model from archival data. Fish Oceanogr 19(6): 526-539.

National Marine Fisheries Service (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. 2000a. Regulatory Amendment 1 to the 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. 2003. Final amendment 1 to the fishery management plan for Atlantic tunas, swordfish, and sharks. USDOC, NOAA, NMFS, Highly Migratory Species Management Division, 1315 East West Highway, Silver Spring, MD.

NMFS. 2004a. Endangered Species Act-Section 7 Re-initiation of Consultation on the Atlantic Pelagic Longline Fishery for Highly Migratory Species. Biological Opinion, June 1, 2004. 154 p.

NMFS. 2004b. Final Supplemental Environmental Impact Statement. Reduction of Sea Turtle Bycatch and Bycatch Mortality in the Atlantic Pelagic Longline Fishery. NOAA, National Marine Fisheries Service, HMS Management Division, Silver Spring, MD.

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.

NMFS. 2007. SEDAR 13 Stock assessment report: small coastal sharks, Atlantic sharpnose, blacknose, bonnethead, and finetooth shark. Silver Spring (MD): HMS Management Division.

NMFS. 2008c. Regulatory amendment 2 to the 2006 HMS FMP: Atlantic Shark Management Measures, July 15, 2008 NOAA, NMFS, HMS Management Division.

NMFS. 2011. 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.

NMFS. 2012. Continued Authorization of the Atlantic Shark Fisheries via the Consolidated HMS Fishery Management Plan as Amended by Amendments 3 and 4 and the Federal Authorization of a Smoothhound Fishery (F/SER/201 1/06520). Biological Opinion, December 12, 2012. 378 p.

NMFS. 2013a. Annual report of the United States to ICCAT. US Department of Commerce, NOAA Fisheries. ANN-045/2013.

NMFS. 2013b. Regulatory amendment 5a to the 2006 HMS FMP: Atlantic Shark Management Measures, July 3, 2013 NOAA, NMFS, HMS Management Division.

NMFS. 2015a. Annual report of the United States to ICCAT (2014). US Department of Commerce, NOAA Fisheries. ANN-038/2015.
NMFS. 2016a. Annual Report of the United States to ICCAT (2015). US Department of Commerce, NOAA Fisheries. ANN-048/2016.
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.
Restrepo VR, Thompson GG, Mace PM, Gabriel WL, Low LL, MacCall AD, Methot D, Powers JE, Taylor BL, Wade PR, Witzig JF. 1998. Technical guidance on the use of precautionary approaches to implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Tech Memo NMFS-F/SPO-31.
Ryder, C.E., T.A. Conant, and B.A Schroeder. 2006. Report of the workshop on marine turtle longline post-interaction mortality. USDOC, NOAA Tech. Mem. NMFS-F/OPR-29.
Schleyer, M.H. and B.J. Tomalin. 2000. Damage on South African coral reefs and an assessment of their sustainable diving capacity using a fisheries approach. Bulletin of Marine Science 67(3):1025-1042.
Standing Committee on Research and Statistics SCRS. 1997. Report of the ICCAT SCRS bluefin tuna stock assessment session. Collective Volume of Scientific Papers. ICCAT 46(1):1-186.
SCRS. 2007. ICCAT Report for Biennial Period, 2006-07, Part II;2:47-262.
SCRS. 2008. ICCAT Report for Biennial Period, 2007-08, Part I; 2:31-271.
SCRS. 2009a. ICCAT Report for Biennial Period, 2008-09, Part II; 2:45-344.
SCRS. 2009b. Report of the 2009 porbeagle stock assessments meeting (Copenhagen, Denmark, June 22 to 27, 2009). ICCAT Collect Vol Sci Pap. 2010; 65(6):1909-2005.
SCRS. 2010. ICCAT Report for Biennial Period, 2010-11, Part I; 2:1-265.
SCRS. 2011. ICCAT Report for Biennial Period, 2010-11, Part II; 2:1-268.
SCRS. 2012a. ICCAT Report for Biennial Period, 2012-13, Part I; 2:1-296.
SCRS. 2012b. 2012 Shortfin mako stock assessment and ecological risk assessment meeting (Olhão, Portugal - June 11 to 18, 2012). ICCAT Collect Vol Sci Pap. 2013; 69(4):1427-1570.
SCRS. 2013. ICCAT Report for Biennial Period, 2012-13, Part II; 2:1-343.
SCRS. 2014a. ICCAT Report for Biennial Period, 2014-15, Part I; 2:1-348.
SCRS. 2014b. Report of the 2014 Atlantic Bluefin Tuna Stock Assessment Session. International Commission for the Conservation of Atlantic Tunas. Madrid, Spain, September 22-27 2014.
SCRS. 2015. Report of the standing committee on research and statistics. ICCAT September 28-October 2, 2015; Madrid, Spain.
SCRS. 2016. Report of the standing committee on research and statistics. ICCAT October 3-7, 2016; Madrid, Spain.
SCRS. 2017. Report of the standing committee on research and statistics. ICCAT October 2-6, 2017; Madrid, Spain.
SEDAR 34a. 2013. Stock assessment report: HMS Atlantic sharpnose shark. SEDAR, SAR Section II, 242 p.
SEDAR 34b. 2013. Stock assessment report: HMS Bonnethead shark. SEDAR, SAR Section II, 222 p.
Shah, A., J.W., Watson, D. Foster, and S. Epperly. 2004. Experiments in the Western Atlantic Northeast Distant Waters to Evaluate Sea Turtle Mitigation Measures in the Pelagic Longline Fishery-Summary of Statistical Analysis. NOAA, NMFS, SEFSC, Pascagoula, MS. Unpublished Report.
Teo SL, Block BA. 2010. Comparative influence of ocean conditions on yellowfin and Atlantic bluefin tuna catch from longlines in the Gulf of Mexico. PLoS ONE 5(5): e10756. doi:10.1371/journalo.pone.0010756

Walli A, Teo SL, Boustany A, Farwell CJ, Williams T, Dewar H, Prince E, Block BA. 2009. Seasonal movements, aggregations and diving behavior of Atlantic BFT (TT) revealed with archival tags. PLoS ONE 4(7): e6151

Walsh, C.F. and L.P Garrison, 2006. Estimated bycatch of marine mammals and turtles in the U.S. Atlantic pelagic longline fleet during 2005. NOAA Technical Memorandum. NMFS-SEFSC-539. 51 p.

Watson, J.W., D.G. Foster, S. Epperly, and A. Shah. 2003. Experiments in the Western Atlantic Northeast Distant Waters to Evaluate Sea Turtle Mitigation Measures in the Pelagic Longline Fishery-Summary of Statistical Analysis. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Pascagoula, MS. Unpublished report.

Watson, J.W., D.G. Foster, S. Epperly, and A. Shah. 2004. Experiments in the Western Atlantic Northeast Distant Waters to Evaluate Sea Turtle Mitigation Measures in the Pelagic Longline Fishery: Report on experiments conducted in 2001–2003. February 4, 2004. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Fisheries Science Center, Pascagoula, MS. 123 p.

Wilson SG and Block BA. 2009. Habitat use in Atlantic bluefin tuna Thunnus thynnus inferred from diving behavior. Endang Species Res. 10: 355-367. doi: 10.3354/esr00240.

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. The chapter focuses on the ecological and socioeconomic impacts of the alternatives on the environment to include bluefin tuna, other Atlantic HMS, and non-HMS species such as dolphin fish; restricted and protected species; and essential fish habitat. Separate impact analyses were completed for each alternative except for the impacts on essential fish habitat, which is 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 DEIS 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 catch do 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. 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 sources. This action focuses on area-based measures. 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 source for this action is fishery-dependent data that reflects 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 encompass all of the reported fishery dependent interactions of HMS-permitted participants in the pelagic longline fishery. In addition to the actual logbook forms (which includes 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, are not required to meet a specific format, but do include, at least, 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., electronic monitoring (EM), bluefin tuna landings and dead discard data submitted via the online IBQ System, bluefin tuna set reports submitted via vessel monitoring systems (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 and protected/restricted species, after

considering all of the available data sources. Logbook data from the pelagic longline fishery reflect catch 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 catch or fishing mortality of species under different scenarios, with the assumption that catches that are much higher than those in recent years could have adverse stock implications if they cause the pelagic longline fisheries to exceed the already-established quotas or are otherwise deemed contrary to conservation and management objectives. Catches or fishing mortality that are much lower than those 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, would have minor adverse or beneficial ecological impacts. For example, a minor beneficial impact could reflect a management option that might benefit large individuals of different species (e.g., some of the weak hook options). A minor adverse impact could result in 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 cause a stock to become overfished. Projected catches or fishing mortality that do not vary from the range of catch expected to occur under a No Action alternative (i.e., status quo) are anticipated to have the same type of impact. Unless otherwise stated, this could be considered a neutral impact, which would likely maintain the current stock status and not contribute to the stock becoming overfished.

- Atlantic HMS included in this analysis focused on certain species either due to relevant nature to the rulemaking (bluefin tuna); prevalence as target species for the fishery (swordfish, yellowfin and bigeye tunas, and dolphin fish); or other reasons such as degree of public interest related to bycatch issues (billfish, sharks), substantial results in data analyses (white marlin), or from 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 are limited by a lack of data points to complete spatial analysis or are not an important component of pelagic longline catch.

- Similar to Atlantic HMS the protected species analysis were focused on certain species for different reasons, including but not limited to their prevalence in the data; existing regulations that prohibit their retention; 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 MSA, the ESA, the 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, dusky sharks, and sea turtles are prohibited onboard pelagic longline vessels. As of 2018, the retention of shortfin mako sharks is only allowed if the sharks are dead at haulback and other conditions are met. Data collected before the interim final rule (2018) and subsequent final FMP Amendment (2019) published were analyzed for this rule, and might reflect more catches and mortality than what is expected to occur in data following implementation.

- 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 2017 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 effective date of Amendment 7 for the gear restricted areas, which was the most recent major bluefin tuna and pelagic longline fishery management action. Management measures implemented under this rulemaking 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. NMFS also anticipates including 2018 data, if available, to update DEIS analyses for the final EIS.

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.

NMFS has 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 catches and catch rates of bluefin tuna 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 losing the restrictions in the area and commenters also stated that data collection should occur before eliminating the areas.

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

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 in the area would continue to occur, but due to the area being implemented to reduce dead discards of bluefin tuna in the pelagic longline fishery and not to lessen other environmental impacts, any potential impacts of the area may be effectively redundant with the IBQ Program. 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 for the past 20 years. Current information about catch rates during normal fishing operations within the area is thus not available. NMFS needed, therefore, 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 of the pelagic longline fishery 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 2017) 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 catches 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 efforts 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 2017) of bluefin tuna and target species (swordfish, yellowfin and bigeye tunas, and dolphin) in the reference area during the month of June in the Northeastern United States Closed Area are anticipated to continue in future years under this alternative (i.e., neutral impacts or no effect) (Table 4.1). 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, 2015–2017)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
Annual catch from open reference area in June	335	40	54	24	197	4	155	8	434

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 2017. All dispositions (e.g., 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. This alternative would maintain recent catch levels and would result in no fishery dependent data (during the course of normal fishing operations) being 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, 2015–2017)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark Discards	Dusky Shark Discards	Sea Turtles Interactions
Annual Catch from Open Reference Area in June	9?	28	5	1	112	4	22

Socioeconomic Impacts

Revenue for bluefin tuna and target species in the reference area during June are shown in Table 4.3 for 2015 through 2017. Average annual revenue for bluefin tuna and target species combined during this time period was $42,942. The no action alternative would maintain the recent landings

levels and corresponding revenues in the reference area, as well as no fishery-dependent data collection during the course of normal fishing operations from within the Northeastern United States Closed Area in June because the area would remain closed to pelagic longline fishing, resulting 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, 2015–2017)

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept	Total Target Species
Average annual revenue	$16,914	$10,055	$4,832	$5,387	$5,755	$42,942

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. Given the current IBQ Program in place, which limits bluefin tuna mortality on an individual vessel basis, this alternative is likely redundant in effect, and thus likely unnecessary in the fishery. Additionally, this alternative does not meet the objective of simplifying and streamlining Atlantic HMS management. Because this alternative does not address the likely redundancies in regulations and maximize opportunity to harvest target species, it 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 sections of the closed area remain closed in June.

Compared to areas 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 of data (1996 – 1997) originally analyzed for implementation of the closure in the 1999 Atlantic HMS Fishery Management Plan for Sharks, Tunas and Swordfish (64 FR 29090; May 28, 1999) (1999 HMS FMP).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 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.

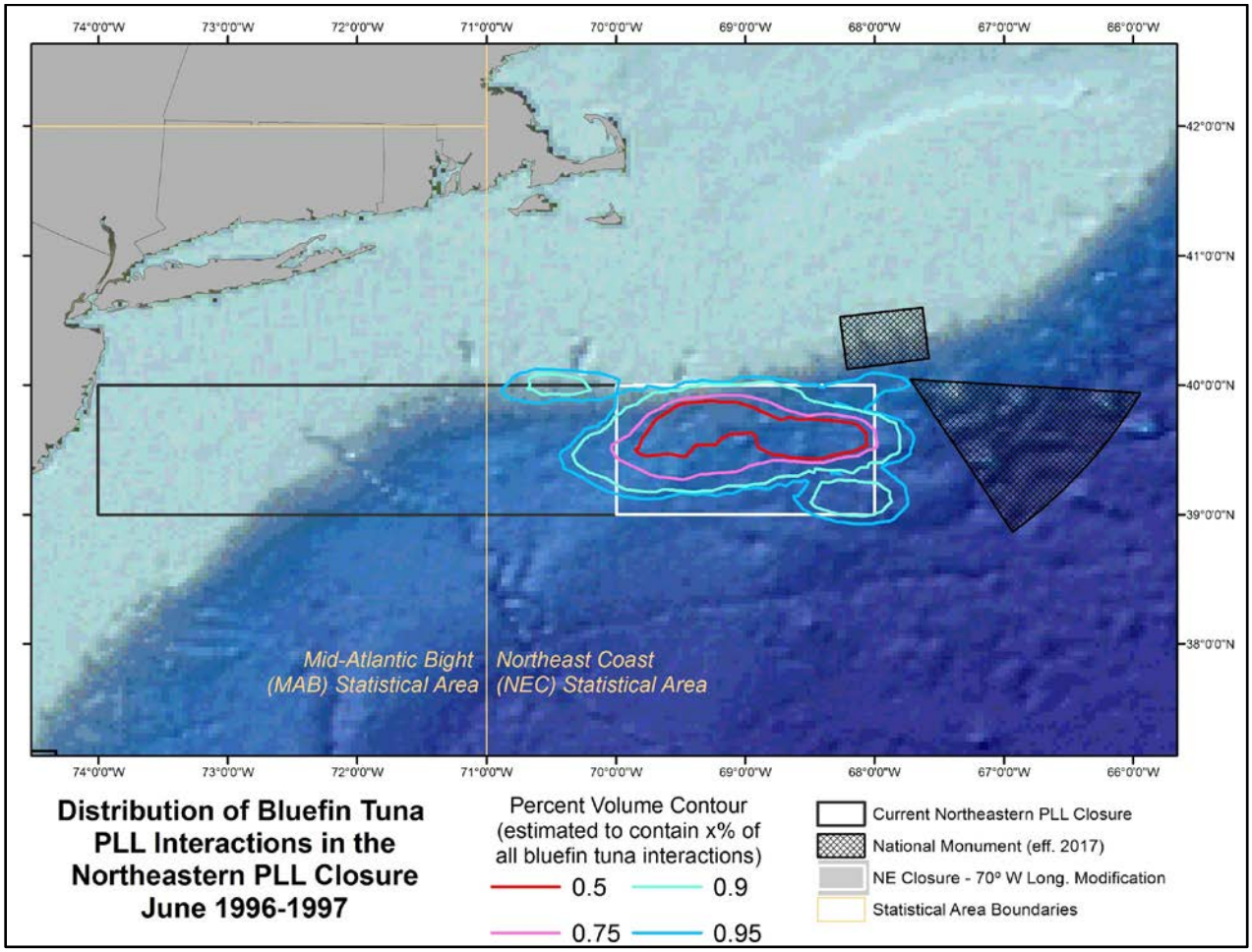

Figure 4.1 Distribution of Historical (1996–1997) Pelagic Longline Bluefin Interactions Occurring Within the Boundaries of the Northeastern U.S. Closed Area

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 into 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 considered in this alternative for opening (areas west of 70°W, dark green box in Figure 4.2) of Northeastern United States Closed Area. 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), the reference area, and area that would remain closed (93 percent) using June data 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 2017 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).

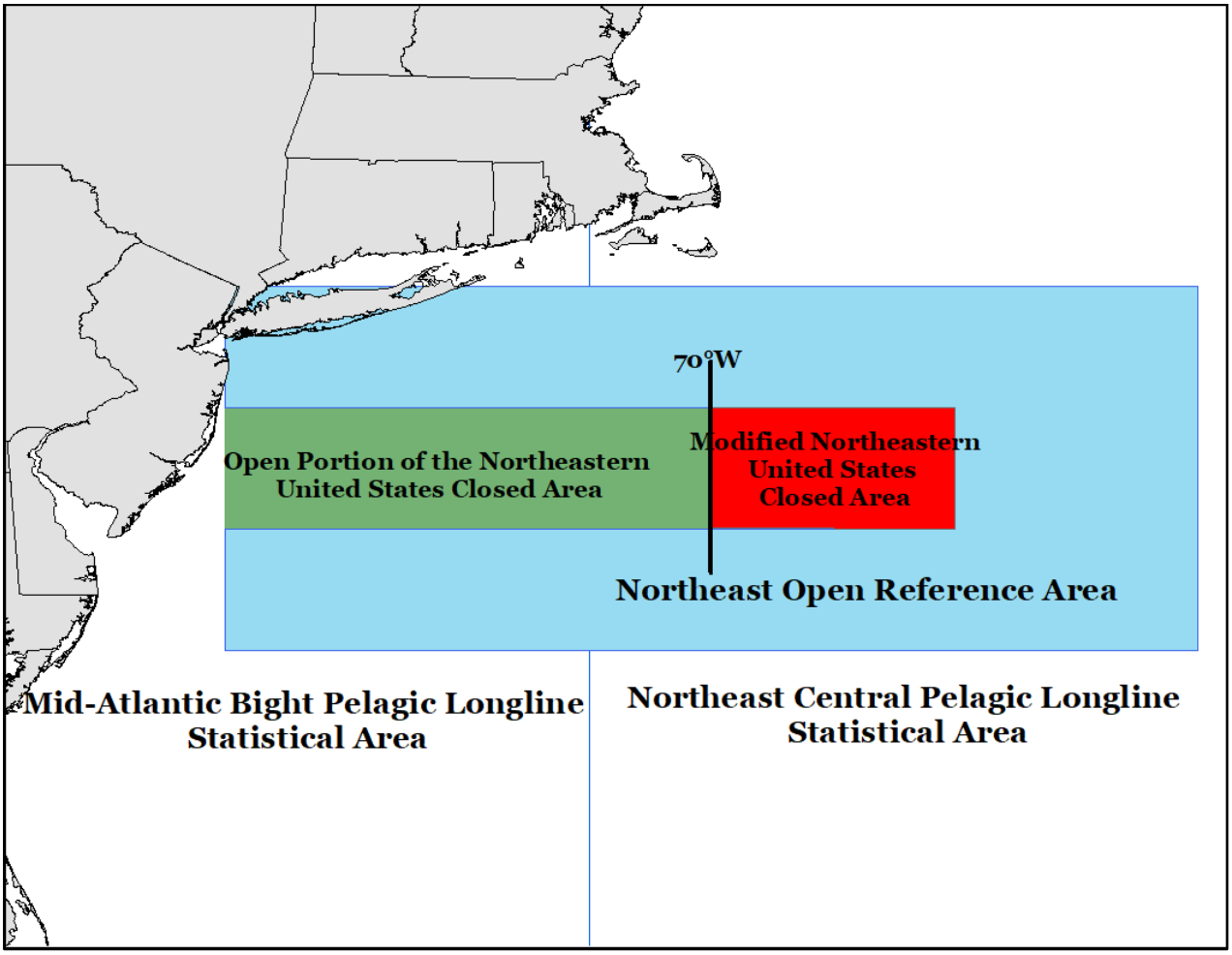

Figure 4.2 Reference Area (Blue Box); Area Considered for Opening (Green Box) in Alternative A2; Area that Could Remain Closed (Red Box)

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

Historical Effort in Closed Area Eest of 70W	Historical Effort in Open Reference Area and 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	50,407 hooks	3,528 hooks

To estimate the catches 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 2017 for the month prior (May) and the month after (July) the closure to predict catch-per-unit efforts and catch numbers. The catch-per-unit efforts for both months provide a range of catches that may occur during the month of June. The catch-per-unit efforts 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. The catch-per-unit efforts were then multiplied by the predicted effort numbers (Table 4.5) to estimate the range of predicted catch that could occur in the area being considered for opening under this alternative. These catch-per-unit efforts were used to estimate catch 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 catches due to numerous changes in the management of the pelagic longline fishery.

From 2015 to 2017, no fishing effort occurred during the month of May, in the area being considered for opening under this alternative; therefore, May catch-per-unit efforts were not available. With the absence of data from May, NMFS is using July as a proxy for catch estimates. 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 catch numbers for the reference area and included those catches to come up with the overall ecological impacts to all species considered in this analysis. These catch 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 catch (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 (3,528 hooks) and dividing by 10,000 hooks. Dividing by 10,000 was necessary since catch rates were are 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 (2015–2017)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
CPUE July (per 10,000 hooks)	29.3	5.8	1.1	0.3	37.8	1.2	38.4	0.3	8.8
Estimated June effort	3,528 hooks								
Predicted catch in modified closed area (based on 7 percent of fishing effort)	10	2	1	1	13	1	14	1	3
Predicted catch occurring in the open reference area (based on 93 percent of fishing effort)	312	37	50	22	183	4	144	7	404
Predicted total catch from the modified closed area and open reference area (sum of two rows above)	322	39	51	23	196	5	158	8	407
Annual catch from open reference area in June (shown from Alternative A1 for ease of comparison)	335	40	54	24	197	4	155	8	434

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 catch estimated for all target species from the area being considered for opening under this Alternative is below the level under the No Action alternative (June catches 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 three additional landed bluefin tuna and two additional discards. 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 catch 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). The predicted catch for all sea turtle species and shortfin mako is 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 catch of bycatch species based on the redistribution analysis completed in the 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 (2015–2017)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark Discards	Dusky Shark Discards	Sea Turtles Interactions
CPUE July (per 10,000 hooks)	0.8	10.4	1.3	0.1	4.0	0	1.1
Estimated June effort	3,528 hooks						
Predicted catch in modified closed area (based on 7 percent of fishing effort)	1	4	1	1	1	0	1
Predicted catch occurring in the open reference area (based on 93 percent of fishing effort)	8	26	5	2	104	4	20
Predicted total catch from the modified closed area and open reference area (sum of two rows above)	9	30	6	3	105	4	21
Annual catch from open reference area in June (shown from Alternative A1 for ease of comparison)	9	28	5	1	112	4	22

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 catch in 2015–2017	335	149	197	155	434
Predicted range of catch	322	51	196	158	407
Percent change from 2015–2017 catch to predicted catch (%)	-4	-66	-1	+2	-6
Average annual revenue in 2015–2017	$16,914	$10,055	$4,832	$5,387	$5,755
Predicted range of average annual revenue	$16,257	$3,442	$4,808	$5,491	$5,397

Total average annual revenue for bluefin tuna and select target species in June of 2015 through 2017 was $42,942 (Table 4.7, sum of bottom row). The predicted total average annual revenue under this alternative would be $35,394. 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 beneficial 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 where most of the effort is currently occurring during the month of June in the adjacent open areas. 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 area remaining closed is still needed to achieve bluefin tuna bycatch management objectives. Also, this alternative does not provide an evaluative mechanism for the modified Northeastern United States Closed Area that would remain closed, does not address redundant regulations in the fishery, known data is over 20 years old, and there are considerable differences in management strategies for the fishery. 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 2019, two 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 vessels that fished in the reference area. 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, at least 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 catch 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 2017 to predict the amount of effort that would be fished in the area (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).

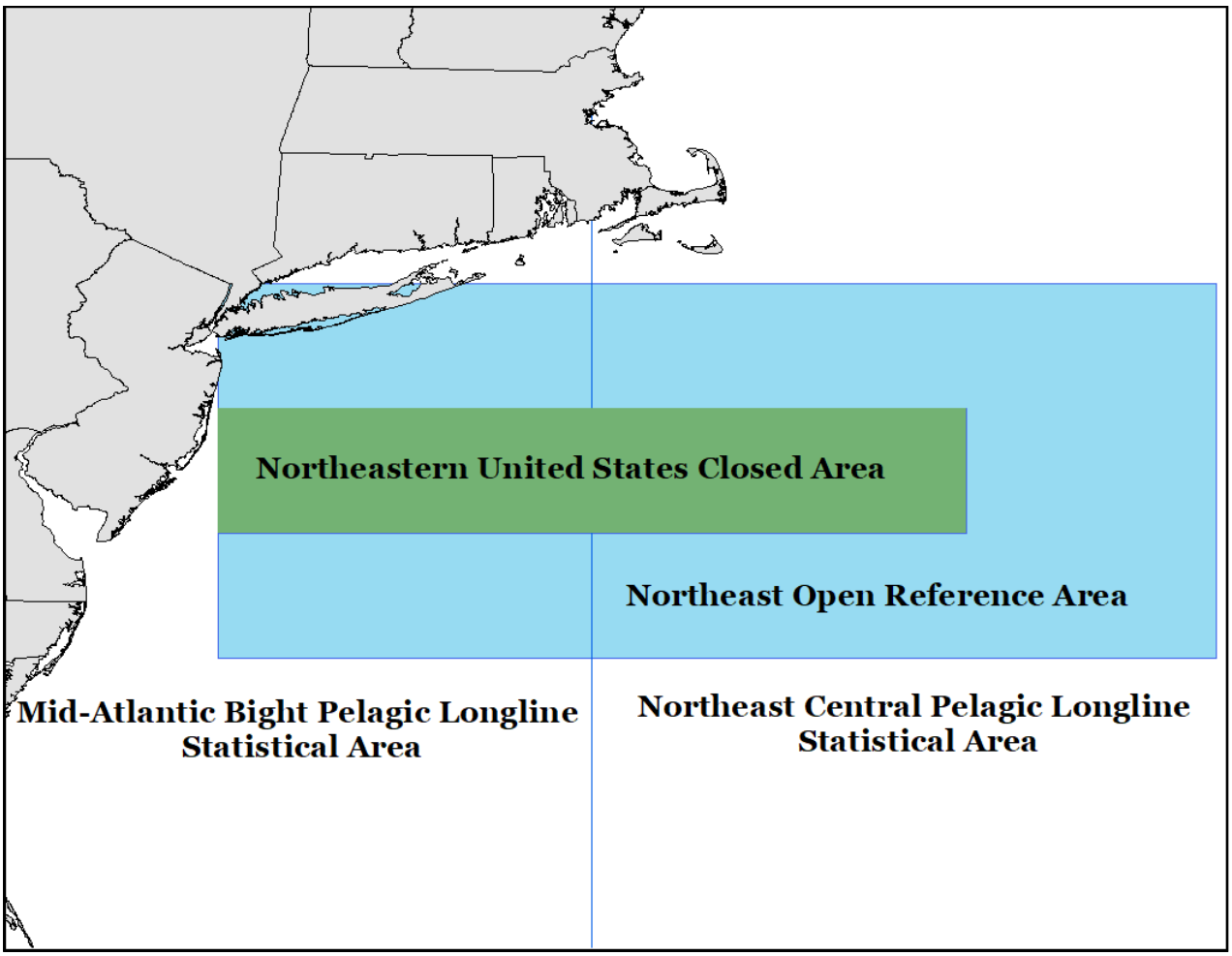

Figure 4.3 Reference Area (Blue Box) for the Northeastern United States Closed Area/Gear Restricted Area (Green Box)

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	50,407 hooks	40,325 hooks

To estimate the catches 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 efforts and catch numbers. The catch-per-unit efforts for both months provide a range of catch that may occur during the month of June. The catch-per-unit efforts for May and July were calculated from pelagic longline sets within the Northeastern United States Gear Restricted Area, which provide the best available data for the Northeastern United States Gear Restricted Area because these are the two months that straddle the period of when the area is currently closed (June). The catch-per-unit efforts were then

combined with the predicted effort numbers to come up with a range of predicted catch 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 catch numbers for the reference area and included those catches to develop the overall ecological impacts to all species considered in this analysis. These catch numbers were annualized for each species and shown in Table 4.9. 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 catch (under the No Action Alternative) would be added to the predicted catch 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 (40,325 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 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. 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, minor, and beneficial, as the range of catch, presented in Table 4.9 (row Predicted Range of Total Catch from the NE U.S. GRA and Open Reference Area) estimated is slightly lower than catches 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 (2015–2017)

	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)	33.5–50.0	0–7.1	1.0–16.7	0–0.4	35.0–88.8	0–1.0	16.7–29.8	0	0–8.8
Estimated June effort	40,325 hooks								
Predicted range of catch in the NE U.S. GRA with performance (based on 80 percent of fishing effort)	135–202	0–29	4–67	0–2	141–358	0–12	67–120	0	0–37
Predicted catch occurring in the open reference areas (based on 20 percent of fishing effort)	67	8	11	5	39	1	31	2	87
Predicted range of total catch from the NE U.S. GRA and open reference area (sum of two rows above)	202–269	8–37	15–78	5–7	180–397	1–13	98–151	2	87–124
Annual catch from open reference area in June (shown from Alternative A1 for ease of comparison)	335	40	54	24	197	4	155	8	434

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 the historical percentage of total hooks fished in the open and gear restricted area will change substantially due to this alternative. The range of catch estimated for many target species is at or below the current June catches from the areas adjacent to the gear restricted area, with the exception of retained yellowfin tuna. The ranges of yellowfin tuna catches for Alternative A3 are above and below the catches in the no action alternative. Should the catches increase, the magnitude of potential increases in yellowfin tuna catch would be small (it would increase catch by 200 fish and are not anticipated to greatly increase the overall United States catch of yellowfin tuna. Therefore, the ecological impacts for yellowfin tuna direct short-term impacts that 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.

Ecological Impacts on Restricted and Protected Species

The methods used for estimating protected species catches 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 catch numbers were annualized for each of these restricted and protected species and shown in Table 4.10.

Table 4.10 CPUE Ranges and Predicted Pelagic Longline Discard Ranges for Restricted and Protected Species for the Northeastern U.S. Gear Restricted Area (2015–2017)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark	Dusky Shark Discards	Sea Turtles Interactions
CPUE Range from May & July (per 10,000 hooks)	0–1.0	0–11.3	0–1.6	0–0.1	6.8–22.2	0	0–1.2
Estimated June effort	40,325 hooks						
Predicted catch in NE U.S. GRA (based on 80 percent of fishing effort)	0–4	0–46	0–7	0–1	28–90	0	0–5
Predicted catch occurring in the open reference areas (based on 20 percent of fishing effort)	2	6	1	0	22	1	4
Predicted total catch from the NE U.S. GRA and open reference area (sum of two rows above)	2–6	6–52	1–8	0–1	50–112	1	4–9
Annual catch from open reference area in June (shown from Alternative A1 for ease of comparison)	9	28	5	1	112	4	22

The predicted catch 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 catch for these species is expected to be lower or only slightly higher (blue marlin 3 additional fish on high range).than the catch from the no action alternative (Alternative A1). The predicted catch for all sea turtle species is expected to result in indirect short-term minor beneficial impacts because the catch of sea turtles is expected to be substantially less than what occurs in the adjacent open areas during the month of June (22 total interactions). Therefore, the impacts are expected to be indirect short-term minor beneficial impacts.

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). Although this upper range of catch could exceed the current catch occurring in the open areas, the catch of 52 white marlin on an annual basis would result in indirect short-term minor adverse impacts to the 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 catch within the Northeastern United States Gear Restricted Area from the values described here, with a corresponding increase in effort or catch in the open area, due to vessels excluded from the gear restricted areas, but the predicted ranges of catch 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 catch including catches from the reference area. Landings numbers for bluefin tuna and target catch were used to predict the socioeconomic impacts (Table 4.11).

Table 4.11. Predicted Pelagic Longline Catch 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 catch in 2015–2017	335	149	197	155	434
Predicted range of catch	202–269	15–78	180–392	98–151	87–124
Percent change from 2015–2017 catch to predicted catch (%)	-40 to -20	-90 to -48	-9 to + 99	-37 to -3	-80 to -71
Average annual revenue in 2015–2017	$16,914	$10,055	$4,832	$5,387	$5,755
Predicted range of average annual revenue	$10,199–$13,581	$1,012–$5,264	$4,415–$9,615	$3,406–$5,248	$1,154–$1,644

Total average annual revenue for bluefin tuna and target species in June of 2015 through 2017 was $42,942 (Table 4.11). The predicted range of total average annual revenue under this alternative would be $20,185 to $35,352. Revenue from some species is predicted to decrease during the month of June, particularly for bluefin 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 despite the predicted decrease 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 catch 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 less 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, since this alternative may limit access to all pelagic longline vessels. For these reasons, NMFS does not prefer this alternative at this time.

4.1.4 Alternative A4: Evaluate 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?. (Step 1, 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.

If the threshold is not met (Step 2, Figure 4.4, Scenario 1) during the month of June in a given year, pelagic longline fishing could continue fishing in the Monitoring Area in June of the following year. If the threshold is exceeded in a given year (Step 2, Figure 4.4, Scenario 2), the area would revert back to a closure for the remainder of June that year and would remain closed in June for the rest of the three-year evaluation period. 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, unless NMFS determines otherwise, the Northeastern United States Pelagic Longline Monitoring Area would be closed to pelagic longline fishing.

If the threshold has not been reached during the evaluation period (Step 1 and Step 2, Figure 4.4), then the Monitoring Area would remain open in following years while NMFS finalizes an evaluation report and considers next steps in a future action (green boxes under Scenario 1 in Step 3 and Step 4, Figure 4.4). The evaluation report would 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, and amount of bycatch with restricted or protected species. If the threshold has been reached during the evaluation period, then the area would remain closed during future effective periods (red boxes under Scenario 2 in Step 3 and Step 4, Figure 4.4). This report would also determine whether future rulemaking is necessary to modify the management of the Monitoring Area after the three year evaluation period.

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 catches 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 3 (Table 4.11).

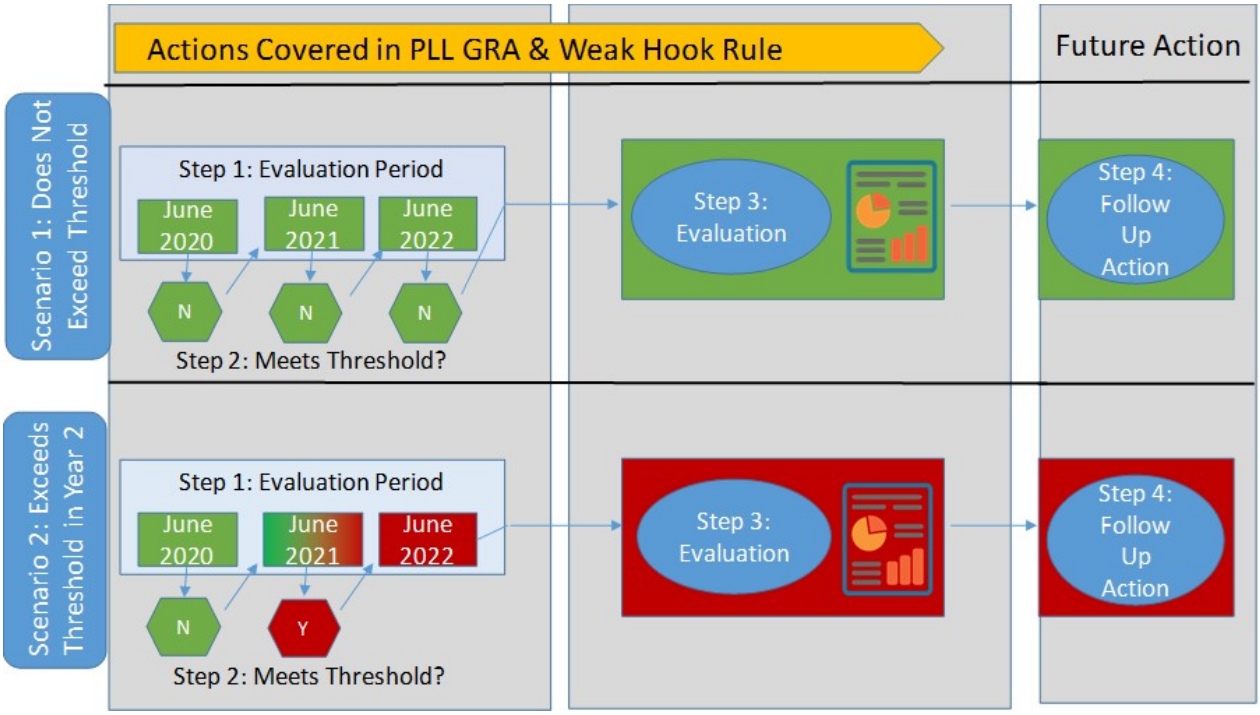

Figure 4.4 Flowchart of the Evaluation Process for the Northeastern United States Pelagic Longline Monitoring Area

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).

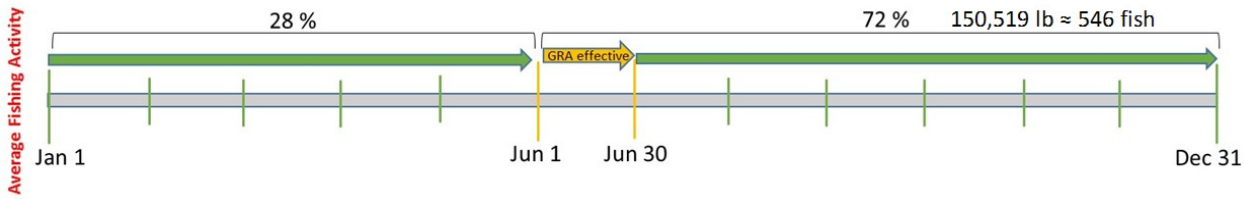

Figure 4.5 Average IBQ Use By the Pelagic Longline Fishery in the Atlantic Region and the Corresponding Threshold for the Northeastern United States Pelagic Longline Monitoring Area

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 (%)	Percent Remaining in Atlantic (%)
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, ecological impacts on bluefin tuna as a result of this alternative are expected to result in direct, short-term, minor beneficial impacts and for, all target species as a result of the preferred alternative would result in direct short-term impacts that are likely to be neutral (Table 4.9). Minor beneficial impacts are expected since decreases in catch are expected for some species. The increases in yellowfin tuna catch are expected to be neutral based on the discussion in Alternative A3.

Long-term impacts on these target species would depend on 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. 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 catch 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 catch would result in indirect short-term minor adverse impacts to the stock. During 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, if necessary, to address any concerns about increased catches.

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, range between minor beneficial to neutral (Table 4.11). Although extremely unlikely, some pelagic longline fishermen could use all of their IBQ allocation 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 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 economic impacts would be comparable to the No Action alternative (i.e., neutral).

Conclusion

This alternative is expected to meet the objectives of optimizing the ability of the pelagic longline fleet to harvest target species and also minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS. This alternative is also expected to meet the objective of adequately conserving and managing the bluefin tuna stock consistent with the quotas because the IBQ Program will be able to adequately account for any bluefin tuna catch that occurs in the monitoring area, while also giving vessel owners more flexibility in deciding where to operate. It should allow the pelagic longline fishery to continue fishing from January through May 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 and BAYS tunas and limits excessive interactions with bluefin tuna while the Monitoring Area is effective. This alternative is aligned with the intent to promote individual accountability within the pelagic longline fishery, since fishermen would have the opportunity to affect future regulatory behavior through responsible fishing practices. This alternative also provides a mechanism to enact a carefully controlled process to evaluate and potentially reduce redundant regulations. 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 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 catches would be the same as presented in Alternative A3 (Table 4.9). Although the estimated catch numbers would be the same, the impacts to bluefin tuna and target species would be long-term, rather than short-term as analyzed in the alternative. Therefore, ecological impacts on bluefin tuna as a result of this alternative are expected to result in direct, short-term, minor beneficial impacts. The ecological impacts on all target species as a result of this alternative would result in direct long-term impacts that are likely to be neutral.

Ecological Impacts on Restricted and Protected Species

The methods used for estimating protected species catches were the same as presented above in Alternative A3. The predicted catch 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 catch would result in indirect short-term minor adverse impacts to the stock.

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 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 (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 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 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 area after the three year monitoring period. This alternative does not align with the objective of adequately conserving and managing the bluefin tuna stock and minimize bycatch and bycatch mortality of bluefin tuna and other Atlantic HMS with the lack of NMFS ability to restrict fishing if bycatch levels of bluefin tuna or other species 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 discards and 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).

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 and 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.

The alternatives, which are listed below, include maintaining the status quo under the No Action alternative and eliminating the Cape Hatteras Gear Restricted Area.

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, 2018 through April 30, 2019 was determined based on data from 2015 through 2017, 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 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 are determined by NMFS to have a relatively low rate of interactions with bluefin tuna relative to target species landings, and that are compliant with reporting and monitoring requirements. 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.

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 biological opinions.

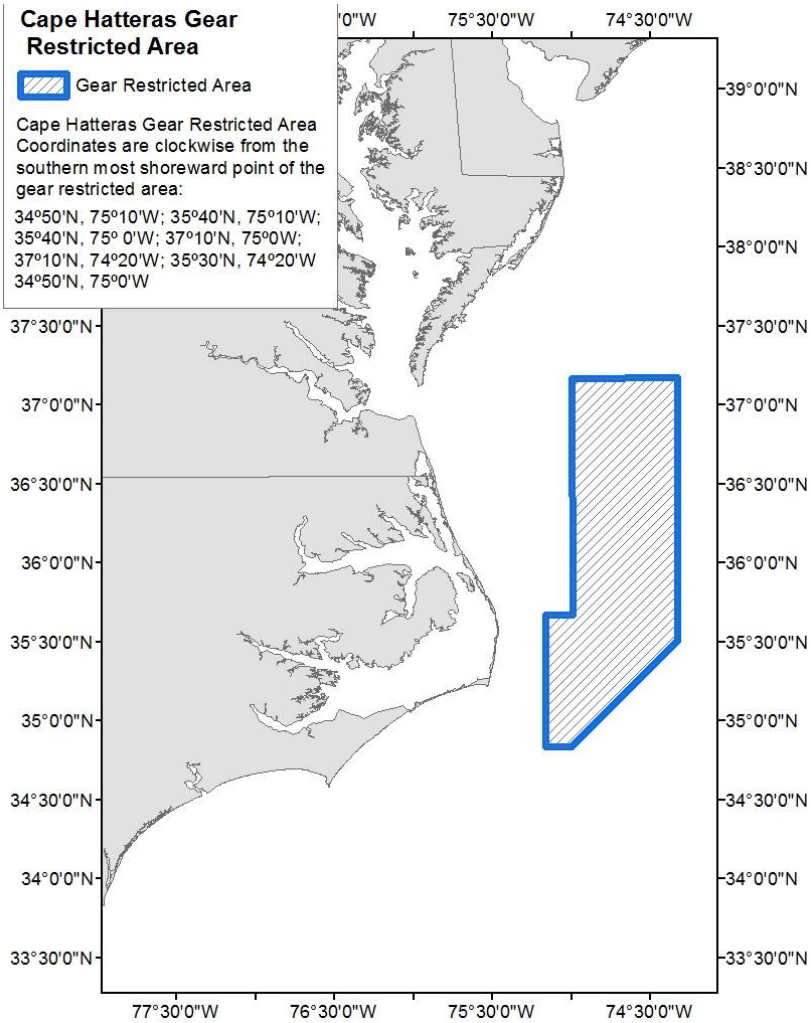

Figure 4.6 Cape Hatteras Gear Restricted Area

Ecological Impacts on Bluefin Tuna and Target Species

It is reasonable to expect under the no action alternative that catch data would likely be similar to recent years (Table 4.13). Approximately 21 bluefin tuna mortalities (19 fish kept and 2 discarded dead) were reported for sets made from vessels granted access to the Cape Hatteras Gear Restricted Area per year. Another 10 bluefin tuna were discarded alive by vessels granted access to the Cape Hatteras Gear Restricted Area per year. Similarly, there were approximately 2,135 target species retained per year by vessels granted access to this area. Swordfish and yellowfin tuna comprised 45 percent (~953 fish/year) and 36 percent (~760 fish/year) of the target species

retained. Fishery wide, the area within the boundaries of the Cape Hatteras Gear Restricted Area contributed 5.94 percent of the total hooks fished during this portion of the year, and 9.58 percent of the hooks fished year round. Bluefin tuna mortalities (i.e., fish retained and discarded dead) in the Cape Hatteras Gear Restricted Area recently accounted for 15.55 percent of the total bluefin tuna mortalities incurred by the pelagic longline fleet from December to April. Ecological impacts to bluefin tuna and other target species are anticipated to be direct, short- and long-term neutral due to no anticipated changes in fishing effort as a result of retaining the gear restricted area.

Ecological Impacts on Restricted and Protected Species

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 2017, 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 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 (6.25 percent or ~4 sharks/year) and sea turtle interactions (14.28 percent or 9 turtles/year) occurring across the fishery during this time period.

During the Cape Hatteras Gear Restricted Area effective months in 2015 through 2017 (January-April, December), data from within the boundaries of this gear restricted area accounted for nearly 46 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. Therefore, it is possible that the total number of shortfin mako discards may be different than what is estimated in this analysis.

Table 4.13 Average Annual Numbers of Target Species Kept and Bluefin Dead Discards (2015–2017) 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	Hooks	Bluefin Kept	Bluefin Discarded Alive	Bluefin Discarded Dead	Swordfish Kept	Bigeye Kept	Yellowfin Kept	Dolphin Kept
A	January	21,193	3	1	0	170	6	9	0
B	February	7,291	4	2	0	33	1	3	0
C	March	1,673	2	2	0	1	0	1	0
D	April	14,059	9	5	1	89	31	108	49
E	December	62,586	2	0	0	660	325	639	8
F	Gear restricted area Dec–Apr average annual total (A+B+C+D+E)	106,803	19	10	2	954	363	761	57
G	Average annual # interactions across fishery (Jan–Apr, Dec)	1,797,932	115	45	20	8,966	3,328	7,713	3,345
H	Gear restricted area percent of average annual totals across fishery (Jan–Apr, Dec) (F/G)*100 (%)	5.94	16.52	22.22	10	10.64	10.91	9.87	1.70
I	Gear restricted area all months average annual total	523,853	37	18	7	1,862	3,154	9,382	3,618
J	Average annual # of interactions across fishery (year round)	5,467,037	398	261	79	25,173	14,659	36,061	43,014
K	Gear restricted area percent of average annual totals across fishery (year round) (I/J)*100 (%)	9.58	9.30	6.90	8.86	7.40	21.52	26.02	8.41

Table 4.14 Average Annual Numbers of Restricted Species and Sea Turtles (2015-2017) 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	11	0	1
B	February	0	0	0	0	4	1	0
C	March	0	0	0	0	0	0	0
D	April	0	1	0	0	10	0	1
E	December	0	2	3	0	28	2	7
F	Gear restricted area Dec–Apr average annual total (A+B+C+D+E)	0	3	3	0	53	4	9
G	Average annual # interactions across fishery (Jan–Apr, Dec)	365	724	403	249	116	64	63
H	Gear restricted area percent of average annual totals across fishery (Jan–Apr, Dec) (F/G)*100 (%)	0	0.41	0.74	0	45.69	6.25	14.28
I	Gear restricted area all months average annual total	10	200	50	39	108	147	66
J	Average annual # of interactions across fishery (year round)	756	2,410	1,201	742	501	354	249
K	Gear restricted area percent of average annual totals across fishery (year round) (I/J)*100 (%)	1.32	8.30	4.16	5.26	21.56	41.53	26.50

Socioeconomic Impacts

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 been granted 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 2018-2019 effective period, 97 vessels (~34.5 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. Although there appears to be some stabilization over the last two years with respect to the number of permits and associated vessels that are either in an invalid permit status (i.e., NOVESID) or have no data to analyze, the number of permit holders granted access to the Cape Hatteras Gear Restricted Area has recently decreased. Approximately 86 percent of active vessels were granted access to the Cape Hatteras Gear Restricted Area in the 2018-2019 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	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019
Data available/ valid permit *Decision: Yes* *Decision: No*	136 *102* *34*	115 *105* *10*	108 *101* *7*	101 *91* *10*	97 *83* *14*
Data available/ no valid permit		10	14	15	15
No data available/invalid permit status *NOVESID*	145 *29*	166 *35*	172 *41*	179 *51*	181 *51*

Sources: HMS logbook data, Pelagic Observer Program.

Further investigation into these data reveal that in recent years an increasingly larger proportion of vessels not qualified for access to the CHGRA are choosing to fish in the Northeast Distant Area (NED), which has a separate 25 mt quota to account for bluefin tuna mortalities (Figure 4.7), and bluefin bycatch within that 25 mt is subject to different regulations Many of these vessels have not fished in the Cape Hatteras Gear Restricted Area since implementation of Amendment 7 management measures. For example, the four vessels not qualified for access to the Cape Hatteras Gear Restricted Area in 2018 with the highest number of bluefin tuna interactions deployed between 32 and 100 percent of their sets in the NED between 2015 and 2017 (all months combined for December - April). Furthermore, although the percentage of sets in the NED versus the rest of the Atlantic has not changed much across the fleet, a higher percentage of total Atlantic bluefin tuna landings are coming from the NED (Figure 4.7). 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, yet NMFS recognizes IBQ is not being used in the NED until the 25 t set-aside quota is reached, hence the fishing practices differ. Only one vessel denied access to the Cape Hatteras Gear Restricted Area in 2018 due to failure to meet the bluefin avoidance performance metric had previously fished within the Cape Hatteras

Gear Restricted Area in recent years between the months of December and April (data not shown to protect data confidentiality). 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 not qualified for access have improved since the qualifying period (2006-2012), they have also increased since the second year of effectiveness for the Cape Hatteras Gear Restricted Area (Chapter 3, Table 3.3). Many of the vessels not qualified 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 qualified for access due to bluefin tuna to target species ratios was the NED. Many vessels not qualified 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 has increased despite higher numbers of participants being excluded in later years (Table 4.17). This is to be expected as fishermen adjust business and fishing practices to comply with performance-based access the Cape Hatteras Gear Restricted Area and IBQ programs, and become more familiar with leasing markets. During its effective period (December-April, 2015 through 2017), sets made within the Cape Hatteras Gear Restricted Area contributed approximately 8.9 percent of the revenue generated for swordfish, 24.5 percent of the revenue from bigeye tuna, and 15 percent of the revenue from bluefin tuna (Table 4.18).

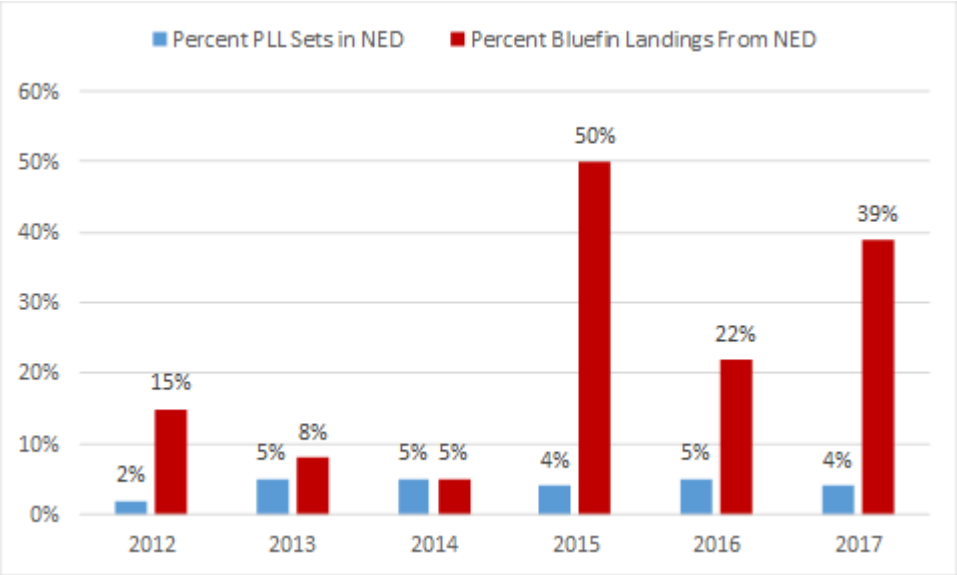

Figure 4.7 Distribution of Pelagic Longline Fishing Activity and Bluefin Landings in the Northeast Distant Area versus the Rest of the Atlantic Fishing Region (Does Not Include Gulf of Mexico)

Source: Draft Three-Year Review of the IBQ Program.

Table 4.16 Distribution of Set Locations (2015–2017) for Vessels not qualified for access to the Cape Hatteras Gear Restricted Area due to Bluefin Avoidance (n = 8 vessels) and Compliance Issues (n = 6 vessels)

Domestic Statistical Management Area (see Figure 4.8)	Bluefin Avoidance (# Sets)	Bluefin Avoidance (% of Total) (Total = 1,613)	Compliance (# Sets)	Compliance (% of Total) (Total = 596)
CAR	**	**	**	**
FEC	107	6.6	212	35.6
GOM	79	4.9	**	**
MAB	230	14.3	**	**
NEC	207	12.8	**	**
SAB	258	16.0	129	21.6
SAR	217	13.5	36	6.0
NED	504	31.2	**	**
NCA	----	----	**	**
Other*	5	0.3	-----	-----

*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.

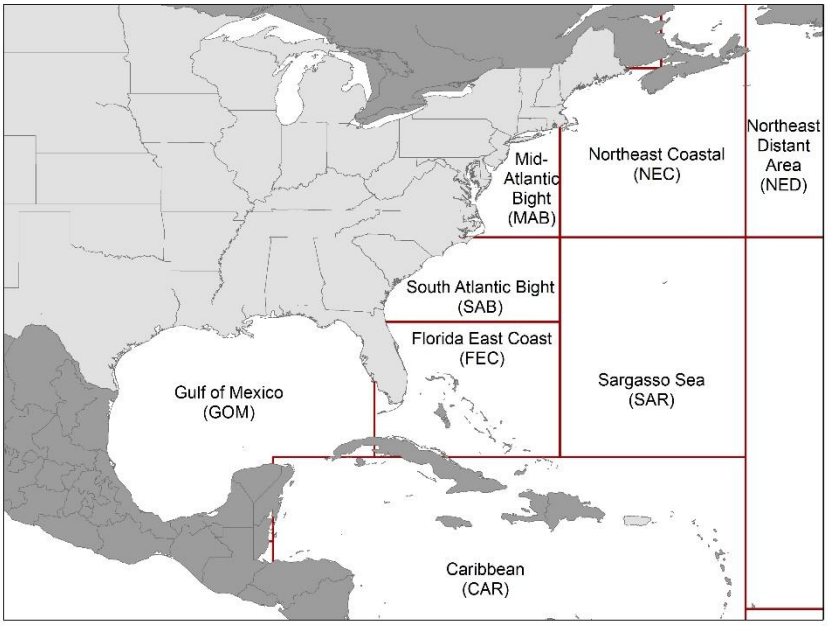

Figure 4.8 Domestic Statistical Management Areas

Table 4.17 Estimated Set Revenue by Year and Species in the Cape Hatteras Gear Restricted Area during Effective Months (Dec–Apr), Rows A-C 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	Percent Change (2015 → 2017) ((C-A)/A) * 100 (%)	-19.6	+286.4	+499.4	+456.1	+476.0	+100.1

Retaining the Cape Hatteras Gear Restricted Area is likely to have neutral socioeconomic impacts fleet-wide, as the majority of vessels not qualified 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 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.

Table 4.18 Average Annual Estimated Set Revenue from Pelagic Longline Target Species and Bluefin in the Cape Hatteras Gear Restricted Area, 2015–2017

	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, under the IBQ Program there is an individual vessel cap on bluefin tuna mortality that limits the number of 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 restricting fishery participants to an individual limit on bluefin tuna mortality creates a regulatory environment where multiple laws are in place to achieve the same objective.. 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 is not preferring 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 major impacts on the western Atlantic bluefin tuna stock. Future fishing activity by vessels in this area would be strictly controlled by the IBQ Program. The majority of the fleet has had access to the area in recent years (Table 4.15). Despite this, there have been substantial reductions in the average annual number of interactions 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 (2015 through 2017, ~ 31 average annual interactions/year) time periods in the boundaries of the Cape Hatteras Gear Restricted Area (Chapter 3.0, Section 3.5.2.2, Table 3.12). 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-Figure 4.11, confidential data not shown). The amount of effort (Figure 4.10) and the catch-per-unit effort (Figure 4.11) that has occurred in the region has decreased before and after implementation. High catch rates (e.g., one cell in the right side map of Figure 4.11 has a catch-per-unit effort of 37.21 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. As noted in Table 4.15 above, approximately 14 percent of the active pelagic longline vessels with sufficient data to evaluate for performance based access were denied access to the Gear Restricted Area in 2018-2019.

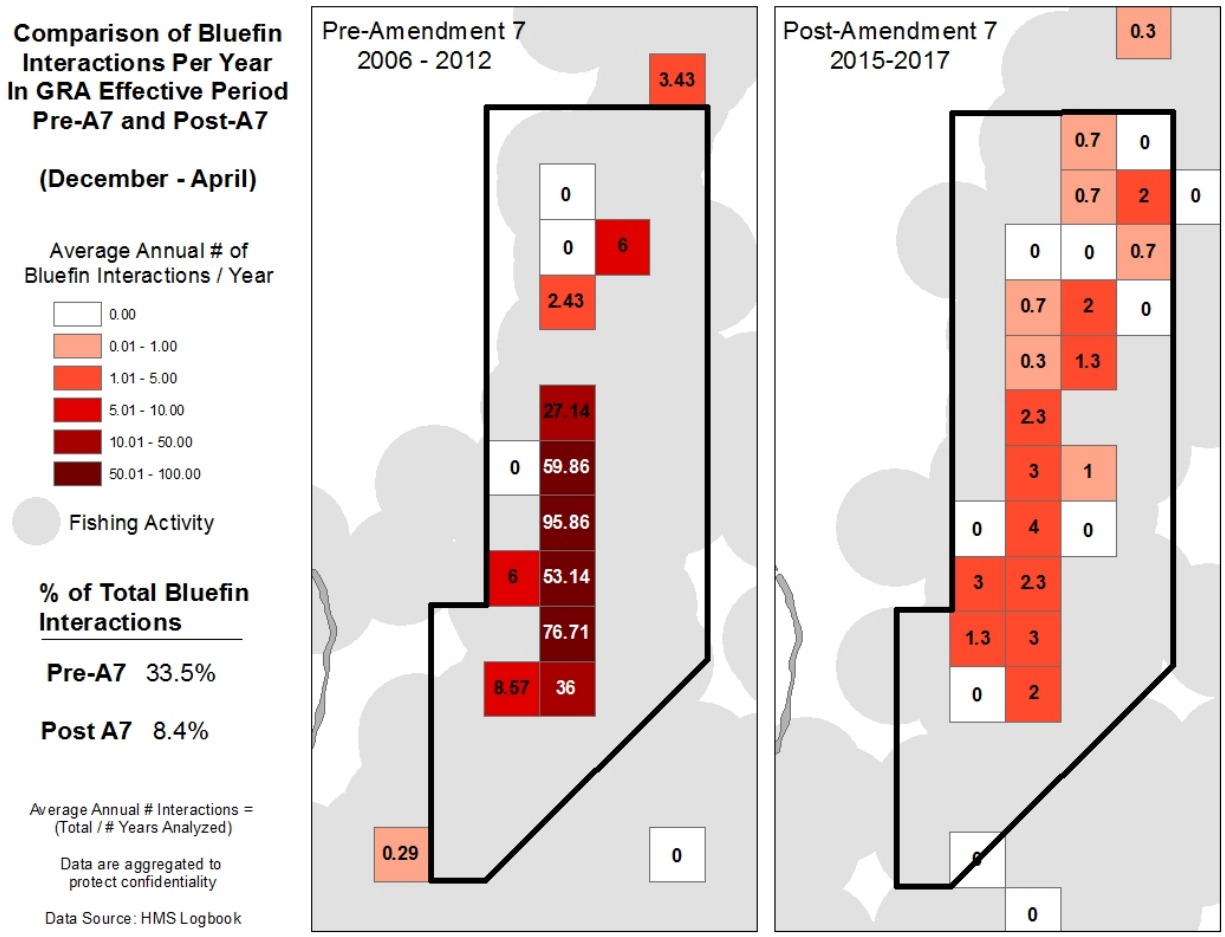

Figure 4.9 Number of Bluefin Interactions per Year in the Cape Hatteras Gear Restricted Area, Before and After Implementation of Amendment 7 Management Measures

Source: HMS logbook data.

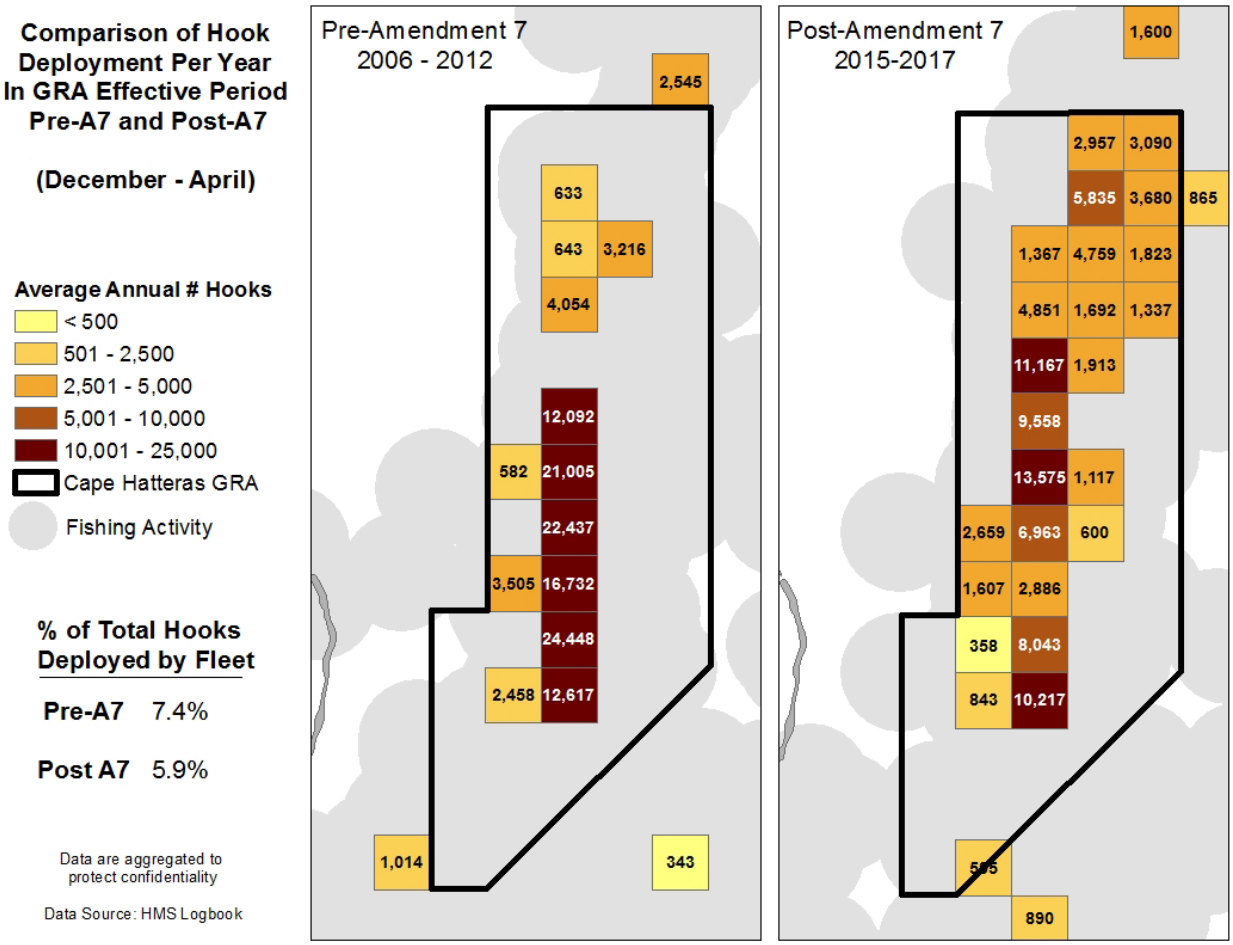

Figure 4.10 Number of Hooks Deployed per Year in the Cape Hatteras Gear Restricted Area, Before and After Implementation of Amendment 7 Management Measures

Source: HMS logbook data.

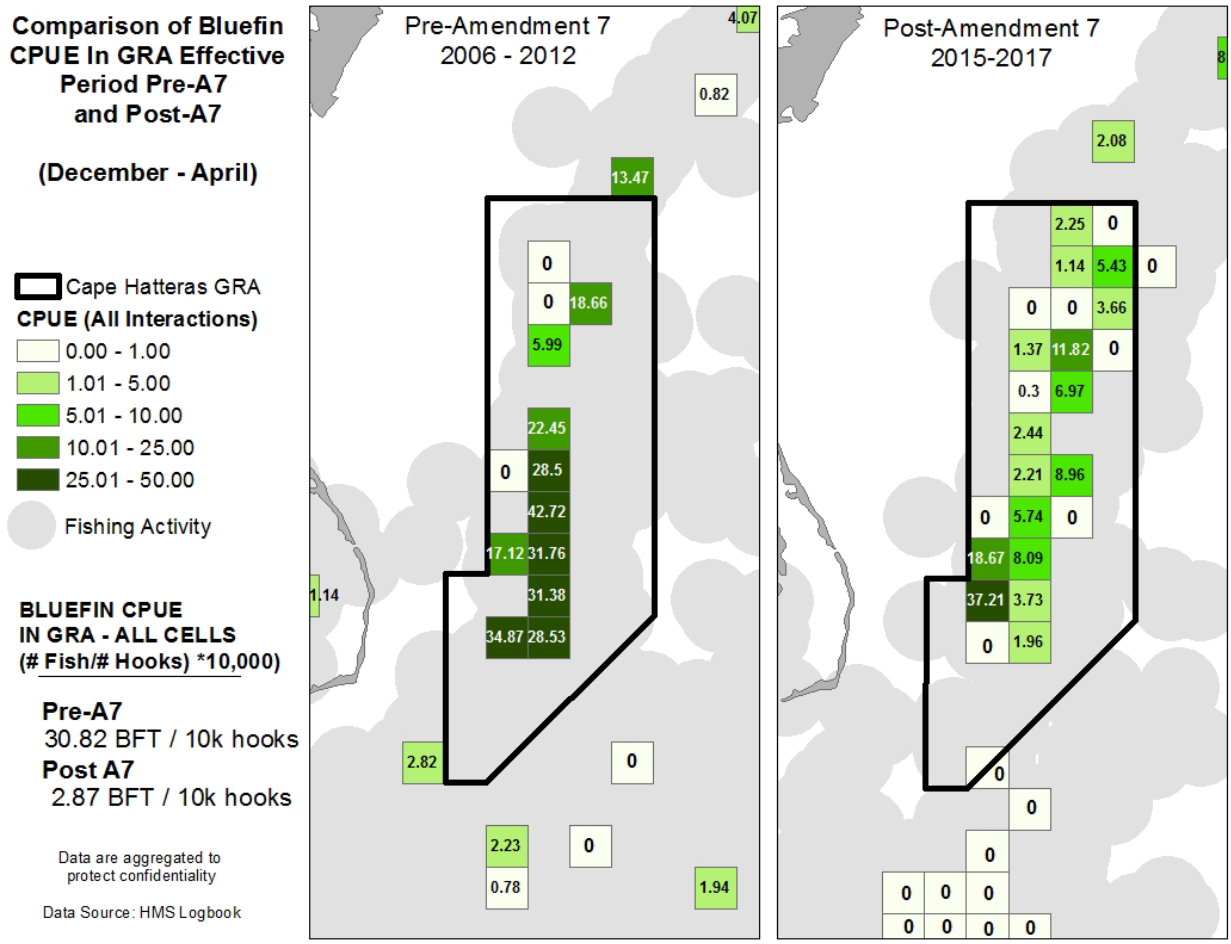

Figure 4.11 Bluefin CPUE in the Cape Hatteras Gear Restricted Area, Before and After Implementation of Amendment 7 Management Measures

Source: HMS logbook data.

Removal of the Cape Hatteras Gear Restricted Area would grant access to a small number of vessels that previously have been temporarily prevented from fishing in this area. Under this alternative, we anticipate 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 catch by these previously-excluded vessels, while also giving vessel owners more flexibility in deciding where to operate.

The vessels that did not qualify 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 qualify 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 not qualified 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 ~ 90 metric tons, ~8.41 metric tons, and 16.6 metric tons, respectively, for a total catch of ~115.7 metric tons. Total accountable catch data for 2018, including dead discards, will be finalized and presented in the next Atlantic HMS SAFE report.

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) were not qualified for access to the area in winter 2014-2015. In more recent winters, the number of vessels denied access to the gear restricted area that previously fished within its boundaries has grown smaller. For example, only one vessel that did not qualify 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). Most of the other vessels that did not qualify 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, Sargasso Sea, Gulf of Mexico, or in open areas of the Mid-Atlantic Bight during the effective months (December-April) (Table 4.16). Many of the vessels that did not qualify for access in 2018-2019 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 qualify 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, effort, and catch rates 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 controlled through the IBQ program and vessels are capped at the total number of landings and dead discards they can accrue without significant financial consequences, and (3) most 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 catch data described under the No Action alternative since the majority of the fleet has had 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. As discussed above, most fishery participants were granted access to the Cape Hatteras Gear Restricted Area. Those that are denied access may only be denied temporarily, i.e., a single year, before being granted access again. 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) and yellowfin tuna (Figure 4.13). As previously noted, only one vessel that did not qualify for access to the Cape Hatteras Gear Restricted Area deployed gear within the area between 2015 and 2017. This participant had access to the Cape Hatteras 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.

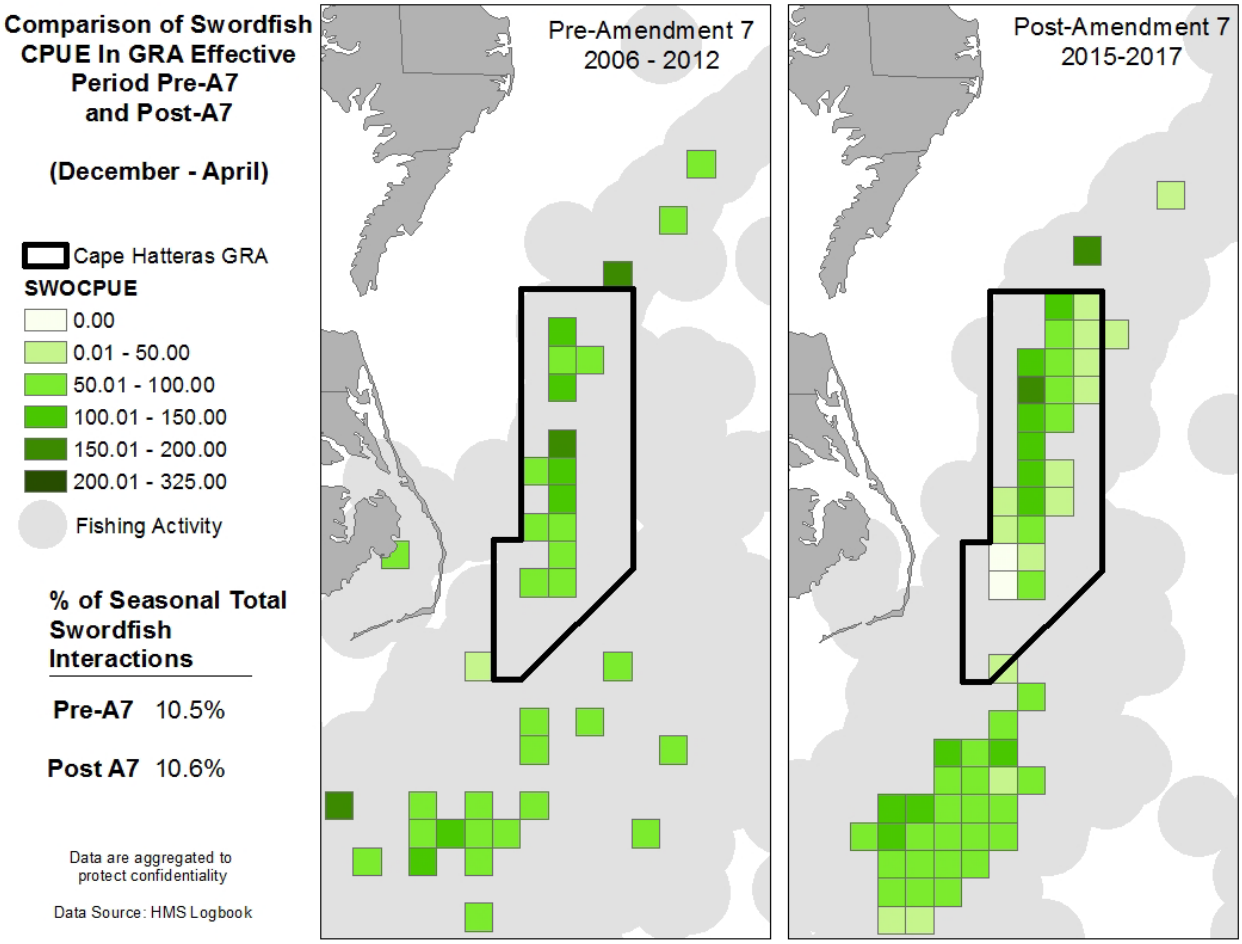

Figure 4.12 Catch Rates (# fish per 10,000 hooks deployed) of Swordfish Before and After Implementation of Amendment 7

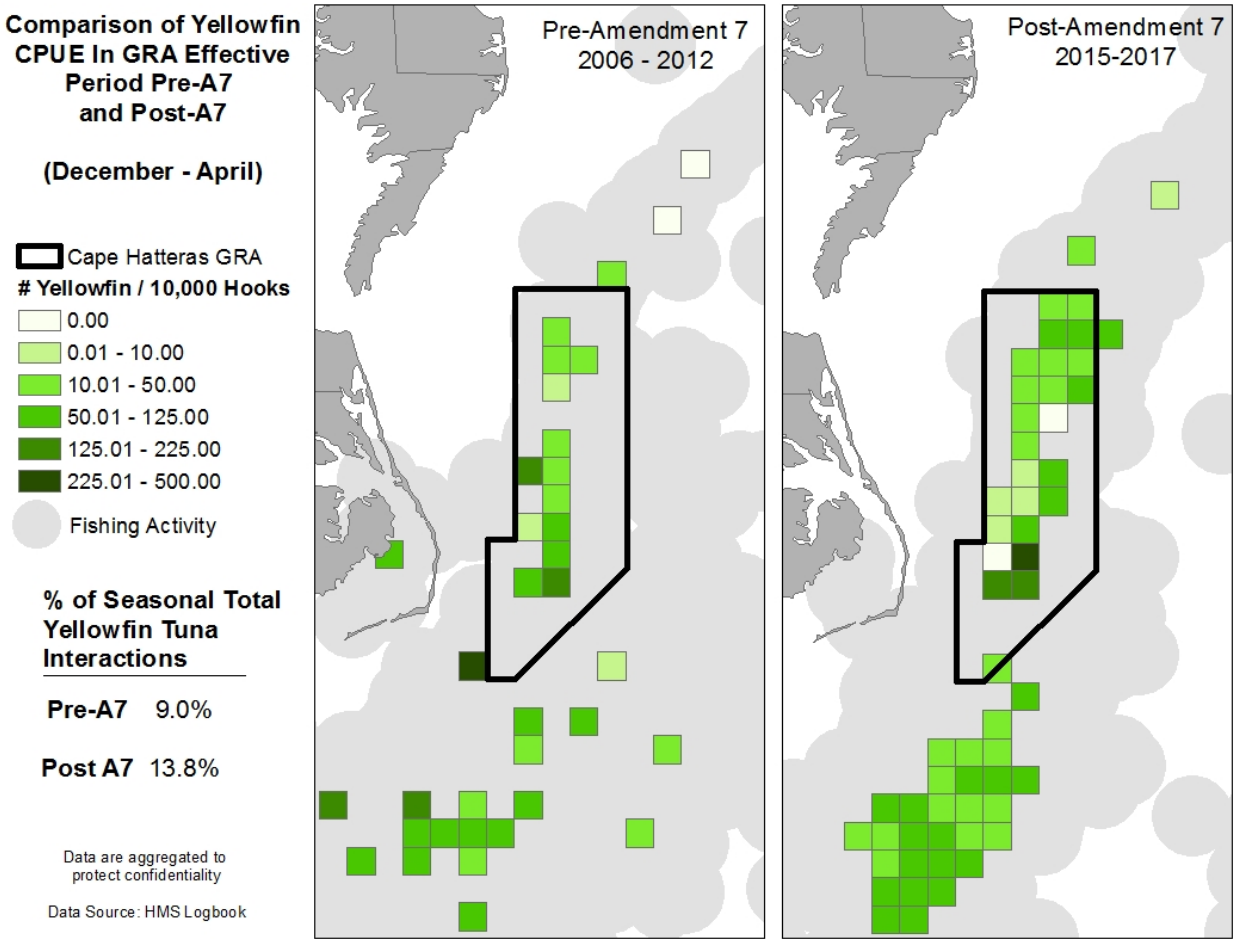

Figure 4.13 Catch Rates (# fish per 10,000 hooks deployed) of Yellowfin Tuna Before and After Implementation of Amendment 7

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 2017) interactions in the Cape Hatteras Gear Restricted Area with billfish and dusky sharks were small (Table 4.14). Only one vessel recently excluded from the Cape Hatteras Gear Restricted Area deployed gear within the area between 2015 and 2017. No interactions with billfish, dusky sharks, or sea turtles were reported in the HMS logbook by this individual vessel within the Cape Hatteras Gear Restricted Area. 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 an 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. 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. Furthermore, 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.

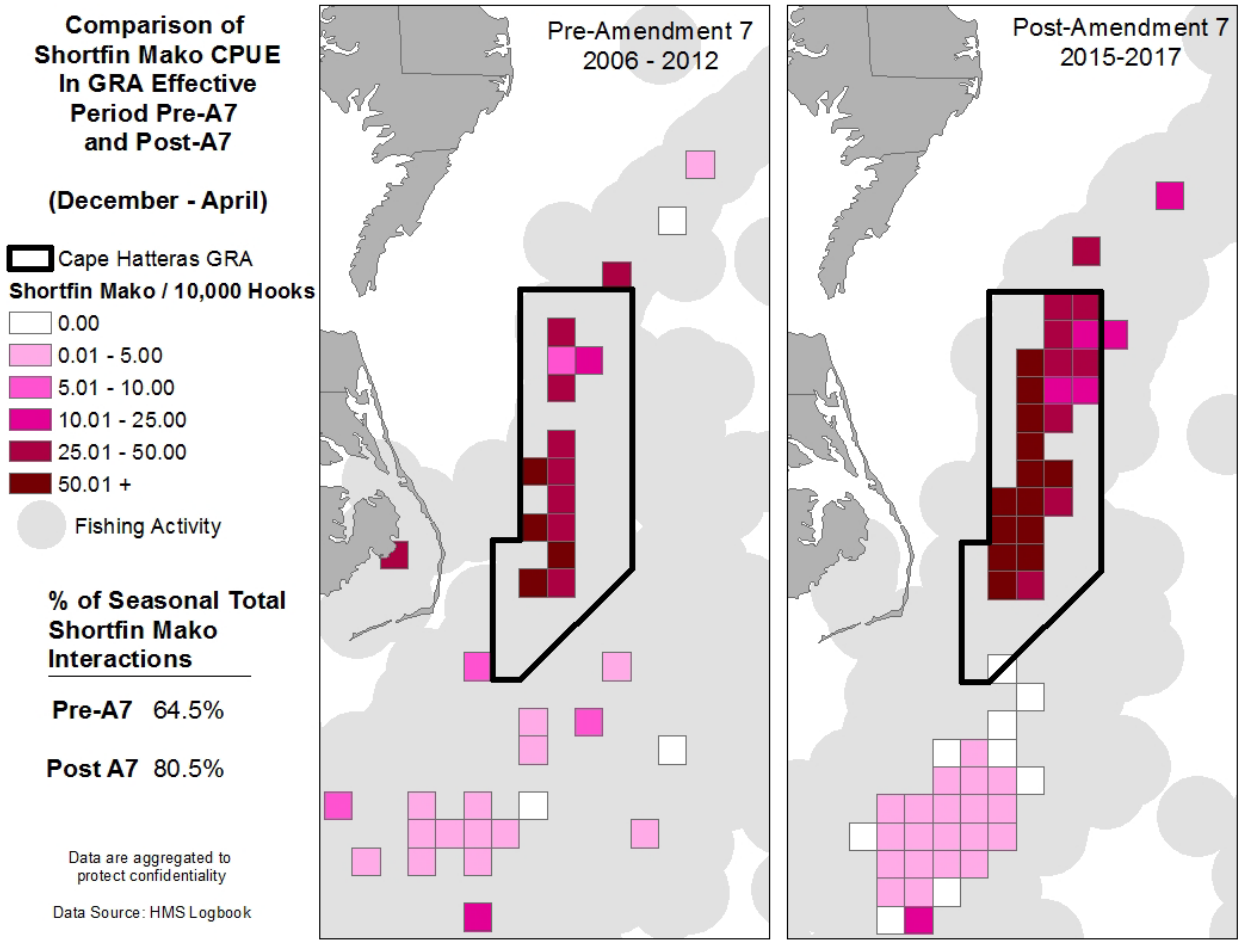

Figure 4.14 Catch Rates (# fish per 10,000 hooks deployed) of Shorfin Mako Before and After Implementation of Amendment 7

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 C1. 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 had access to the area and continued to fish in it following implementation of Amendment 7 management measures. Vessels recently denied access (for the 2018-2019 effective period) to the Cape Hatteras Gear Restricted Area fished in a variety of locations (Table 4.16) between 2015 and 2017. Many of these vessels did not make sets within this area either prior to implementation or after implementation when access was granted. 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 functionally redundant layers of regulation and year-to-year uncertainty associated with access decisions. 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 depending 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 mortality in this region. Under the IBQ Program there is an individual vessel cap on bluefin tuna mortality that limits the number of landings or dead discards by fishery participants operating in this area. As previously indicated, the pelagic longline fleet has only used a little over half of the available Atlantic category IBQ allocation to cover landings. 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 restricting fishery participants to an individual limit on bluefin tuna mortality through the IBQ Program creates a regulatory environment where multiple regulations are in place to achieve the same objective.

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. The purpose of performance metrics is to incentivize adjustments in fishing behavior to reduce bluefin tuna mortality, and they are especially useful in addressing excessive mortality 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 2018 never recently (2015 through 2017) fished 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 areas seaward of the Bahamian EEZ. Poor bluefin tuna avoidance scores are now largely attributable to bluefin tuna captured or discarded dead under a separate 25 t quota for the NED, often at different times of year than when the Cape Hatteras Gear Restricted Area is effective (Figure 4.7). As landings and dead discards count against the 25 t NED set-quota until this threshold is reached, vessel operators have no incentive to avoid or release bluefin tuna, as they are not counted against their IBQ. However, these interactions have

been incorporated into performance metric calculations that grant or deny access to the Cape Hatteras Gear Restricted Area. This aspect is being reconsidered under the Amendment 13 rulemaking. 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 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.

4.3 Spring Gulf of Mexico Gear Restricted Areas

In this document, NMFS analyzes several alternatives to evaluate whether the Spring Gulf of Mexico Gear Restricted Areas 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. The preferred alternative being considered for the Spring Gulf of Mexico Gear Restricted Areas 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.

NMFS was asked to consider whether the Gulf of Mexico gear restricted areas are still needed to limit bluefin tuna interactions, given the reductions achieved in Gulf of Mexico bluefin tuna mortality (landings and dead discards) in recent years. During scoping for this rulemaking, NMFS received comments in support of eliminating the gear restricted areas 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 Gulf of Mexico gear restricted areas or relieving restrictions on pelagic longline fishing in the Gulf of Mexico in any way. Commenters also recommended not applying performance metrics due to anticipated minimal conservation benefits.

Alternative C1: No Action. Spring Gulf of Mexico Gear Restricted Areas 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 Areas.

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

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

4.3.1 Alternative C1: No Action

This alternative would maintain the current regulations regarding the Spring Gulf of Mexico Gear Restricted Areas 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 Areas. 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 Areas were identified in Amendment 7 as areas of higher concentrations of bluefin tuna in April and May. Since this spawning activity is occurring reducing interactions in the Gulf of Mexico through this gear restricted area could enhance spawning potential and stock growth. Any potential protection of bluefin tuna in the areas could continue to occur, but due to the areas being implemented to reduce dead discards in the pelagic longline fishery, it is effectively redundant with the IBQ Program. This alternative would not allow for any data collection 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, 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. Catches 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 Areas are shown in Table 4.19 for 2015 through 2017. 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 catches could have occurred under the IBQ Program in the area and if the area is appropriate located (i.e., 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 Areas (April–May, 2015–2017)

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
Average annual catch	522	157	4	5	1,518	106	14	1	117

Ecological Impacts on 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 Gulf of Mexico during the time period of the Spring Gulf of Mexico Gear Restricted Areas are shown in Table 4.20 for 2015 through 2017. All dispositions of shortfin mako sharks were tallied together since the vast majority of interactions will be live releases 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 maintain 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 Discards or Interactions for Restricted and Protected Species in the Open Area of the Gulf of Mexico during the Time Period of the Spring Gulf of Mexico Gear Restricted Areas (April–May, 2015–2017)

	Roundscale Spearfish Discards	White Marlin Discards	Blue Marlin Discards	Atlantic Sailfish Discards	Shortfin Mako Shark Interactions	Dusky Shark Discards	Sea Turtle Interactions
Average annual catch	8	46	31	29	12	15	4

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 Areas are shown in Table 4.21 for 2015 through 2017. Average annual revenue for bluefin tuna and target species combined during this time period was $627,842. 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 Areas (April–May, 2015–2017)

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept	Total Target Species
Average Annual Revenue	$260,018	$6,648	$351,899	$5,519	$3,758	$627,842

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 Areas 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 Areas 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 Areas

This alternative would allow performance-based access to the Spring Gulf of Mexico Gear Restricted Areas 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 criteria (i.e., performance metrics) to evaluate 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. Vessel data reflecting the three most recent years of available data would be compiled annually from HMS logbooks and the Pelagic Observer Program. For example, in 2020, vessel access for the gear restricted area's effective period of April 1 through May 31 would be determined based on data from 2016 through 2018, as 2019 HMS logbook data would generally not be available for a given year until the following August (2020) due to late reporting and QA/QC processes. Vessels would be allowed to fish in the areas using pelagic longline gear if they are determined by NMFS to have a relatively low rate of interactions with bluefin tuna relative to target species landings, and that are compliant with reporting and monitoring requirements. 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 access to the Cape Hatteras and Spring Gulf of Mexico Gear Restricted Areas until NMFS has collected sufficient data for assessment (consistent with current operational Amendment 7 implementation procedures). If a vessel has demonstrated its ability to avoid bluefin tuna, but has had poor compliance with reporting and monitoring requirements, it would not be allowed to fish with pelagic longline gear in these areas from April 1 through May 31. This program would be evaluated after at least three years of data have been collected to determine whether these measures effectively achieve the management objectives of this rulemaking. If deemed appropriate, NMFS could take further action based on the findings of the evaluation that might include continuing the performance based access, reverting the areas back to a gear restricted areas without performance based access, converting the gear restricted areas to Closed Areas, opening the areas to pelagic longline fishing, or some other action.

The application of existing performance based gear restricted area access regulations can provide an example of how this alternative could be applied for the Spring Gulf of Mexico Gear Restricted Areas. In the analyses of gear restricted area access since implementation, up to three pelagic

longline vessels associated with Gulf of Mexico IBQ shares have been excluded from 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 be excluded from the Spring Gulf of Mexico Gear Restricted Areas under this alternative but could access the area if those vessels increase their performance level. Therefore, given this trend in access determinations, under this alternative, at least 94 percent of vessels with Gulf of Mexico IBQ would be expected to have access to the Spring Gulf of Mexico Gear Restricted Areas but given the high likelihood of increased compliance and bluefin tuna avoidance NMFS assumed all vessels with Gulf of Mexico IBQ would have access.

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 Areas 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 biological opinions.

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 Areas, 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 Areas 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 2017 (i.e., the three-year time period when the Spring Gulf of Mexico Gear Restricted Areas have been in effect), to predict the amount of effort that would be fished in the Spring Gulf of Mexico Gear Restricted Areas 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 Areas

Historical effort in the area of the Gulf of Mexico Gear Restricted Areas (April and May, 2012–2014)	Historical effort in the area outside the Gulf of Mexico Gear Restricted Areas (April and May, 2012-2014)	Historical percent of total hooks in the Gear Restricted Areas	Current effort in Gulf of Mexico Open Area (April and May, 2015–2017)	Expected effort to be fished in Monitoring Areas
142,757 hooks	243,614 hooks	37 percent	176,447 hooks	65,194 hooks

To estimate the catches that could occur during the month of April and May in the Spring Gulf of Mexico Gear Restricted Areas, NMFS used fleet-wide catch-per-unit efforts for the month prior (March) and the month after (June) the Spring Gulf of Mexico Gear Restricted Areas are in place to

predict catch-per-unit efforts and catch numbers for the months of April and May. The catch-per-unit efforts for both months provide a range of catch rates that may be expected to occur during the months of April and May. The catch-per-unit efforts for March and June were derived from pelagic longline sets within the area of the Spring Gulf of Mexico Gear Restricted Areas in 2015 through 2017, which provide the best available data for the Spring Gulf of Mexico Gear Restricted Areas. The catch-per-unit efforts were multiplied with the predicted effort numbers to provide a range of predicted catch that would occur in the Spring Gulf of Mexico Gear Restricted Areas. Given that NMFS anticipates that only 37 percent of the current effort (2015-2017) would occur in the Spring Gulf of Mexico Gear Restricted Areas, 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 catch numbers 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. These catch numbers 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 catch 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 catch-per-unit effort 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 Areas. As described above, at least 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 Areas. There could be a slight decrease in effort or catch within the Spring Gulf of Mexico Gear Restricted Areas from the values described here, with a corresponding increase in effort or catch 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.

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 (Alternative C1, compare catch-per-unit effort in Table 4.19 and Table 4.23). Additionally, allowing performance based access to the Spring Gulf of Mexico Gear Restricted Areas 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 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 catches of target species from the open area of the Gulf of Mexico fall within the range of predicted catches, with the exception of a predicted lower number of swordfish kept. Also, the ranges of yellowfin tuna catches are above and below the expected catches of yellowfin tuna under alternative C2 (compare catch-per-unit effort in Table 4.19 and Table 4.23). Should the catches increase, the magnitude of potential increases in yellowfin tuna catch 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

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 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 Areas and Total Gulf of Mexico in April–May

	Swordfish Kept	Swordfish Discards	Bluefin Kept	Bluefin Discards	Yellowfin Kept	Yellowfin Discards	Bigeye Kept	Bigeye Discards	Dolphin Kept
CPUE range from March & June, 2015–2017 (per 10,000 hooks)	7.5–19.8	8.4–13.5	0–0.6	0.4–0.7	52.2–97.0	0.6–19.5	0.7–4.2	0–0.3	0.9–9.7
Predicted effort in the gear restricted areas	65,194 hooks								
Predicted range of catch in the gear restricted areas (based on 37 percent of fishing effort)	49–129	55–88	0–4	2–4	340–632	4–127	5–28	0–2	6–63
Predicted catch in the open area (based on 63 percent of fishing effort)	329	99	3	3	956	67	9	1	74
Predicted range of total Gulf of Mexico catch (sum of two rows above)	378–458	154–187	3–7	5–7	1,296–1,588	71–194	14–37	1–3	80–137
Average annual catch from the open areas of the Gulf of Mexico (Alternative C1)	522	157	4	5	1,518	106	14	1	117

Long-term impacts on these species would depend on future trends in performance based access to the Spring Gulf of Mexico Gear Restricted Areas. 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 catches 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 interactions will be discards following the implementation of Amendment 11. Also, due to low interactions with sea turtles, all sea turtle interactions were combined. The catch 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 catch 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 Areas. There could be a slight decrease in effort or catch within the Spring Gulf of Mexico Gear Restricted Areas from the values described here, with a corresponding increase in effort or catch 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.

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

	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, 2015–2017 (per 10,000 hooks)	0.9–5.7	0.7–4.0	0.5–3.2	0.2–5.4	0.1–0.5	0.1–0.2	0.2–0.3
Predicted effort in the gear restricted areas	65,194 hooks						
Predicted range of catch in the gear restricted areas (based on 37 percent of fishing effort)	6–37	4–26	3–21	1–35	1–3	0–1	1–2
Predicted catch in the open area (based on 63 percent of fishing effort)	5	29	20	18	8	9	3
Predicted range of total Gulf of Mexico catch (sum of two rows above)	11–42	33–55	23–41	19–53	9–11	9–10	4–5
Average annual catch from the open areas of the Gulf of Mexico (Alternative C1)	8	46	31	29	12	15	4

Socioeconomic Impacts

Catch 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 Areas 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 Areas in April–May

	Swordfish Kept	Bluefin Kept	Yellowfin Kept	Bigeye Kept	Dolphin Kept
Average annual catch in 2015–2017	522	4	1,518	14	117
Predicted range of catch	378–458	3–7	1,296–1,588	14–37	80–137
Percent change from 2015–2017 catch to predicted catch (%)	-28 to -12	-25 to +75	-15 to +5	0 to +164	-32 to +17
Average annual revenue in 2015–2017	$260,018	$6,648	$351,899	$5,519	$3,758
Predicted range of average annual revenue	$188,289–$228,139	$4,986–$11,634	$300,435–$368,126	$5,519–$14,586	$2,569–$4,400

Total average annual revenue for bluefin tuna and target species in April and May of 2015 through 2017 was $627,842 (Table 4.25). The predicted range of total average annual revenue with performance based access would be $501,799 to $626,885. 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 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. Access to the Spring Gulf of Mexico 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.

Long-term impacts on these species would depend on future trends in performance based access to the Spring Gulf of Mexico Gear Restricted Areas. 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 Areas. There could be a slight decrease in revenues within the Spring Gulf of Mexico 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.

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 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 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 Area. The reasons for establishing the gear restricted area are discussed above in Alternative C1. Fishing activity would be closely monitored by the NMFS under a four-step process (Step 1 of 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. In Figure 4.15, green boxes depict time periods when the Spring Gulf of Mexico Monitoring Area would be open to fishing. Red boxes depict time periods when the Spring Gulf of Mexico Monitoring Area would be closed to fishing. The green to red gradient box depicts a time period in the second scenario when an inseason action is hypothetically used to close the Spring Gulf of Mexico Monitoring Area at the end of April. The Monitoring Area would remain open to pelagic longline fishing during the months of April and May 31 of each year (previously the area had been closed to pelagic longline fishing during these months) (Step 1 of Figure 4.15).

NMFS would apply a threshold of 63,150 pounds of IBQ allocation that may be used to account for landings and dead discards of bluefin tuna caught within the boundaries of the Spring Gulf of Mexico Monitoring Area (Step 2, Figure 4.15, Figure 4.16). This threshold would be equivalent to the amount of IBQ annual allocation distributed to vessels that fished in the region while the closures were effective between 2015 and 2017. 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. 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. As presented 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 Areas (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 Area could be considered more restrictive with respect to bluefin tuna mortality.

If the threshold is not met (Step 2, Figure 4.15, Scenario 1) during the month of April and May in a given year, pelagic longline fishing could continue fishing in the Monitoring Areas in April and May of the following year. If the threshold is exceeded in a given year (Step 2, Figure 4.15, Scenario 2), the area would revert back to gear restricted areas for the remainder of June that year and would remain closed in April and May for the rest of the three-year evaluation period. 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, unless NMFS determines otherwise, the Spring Gulf of Mexico Monitoring Areas would be closed to pelagic longline fishing.

If the threshold has not been reached during the evaluation period (Step 1 and Step 2, Figure 4.15), then the Monitoring Areas would remain open in following years while NMFS finalizes an evaluation report and considers next steps in a future action (green boxes under Scenario 1 in Step 3 and Step 4, Figure 4.15). The evaluation report would 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, and amount of bycatch with restricted or protected species. If the threshold has been reached during the evaluation period, then the area would remain closed during future effective periods (red boxes under Scenario 2 in Step 3 and Step 4, Figure 4.15). This report would also determine whether future rulemaking is necessary to modify the management of the Monitoring Area after the three year evaluation period.

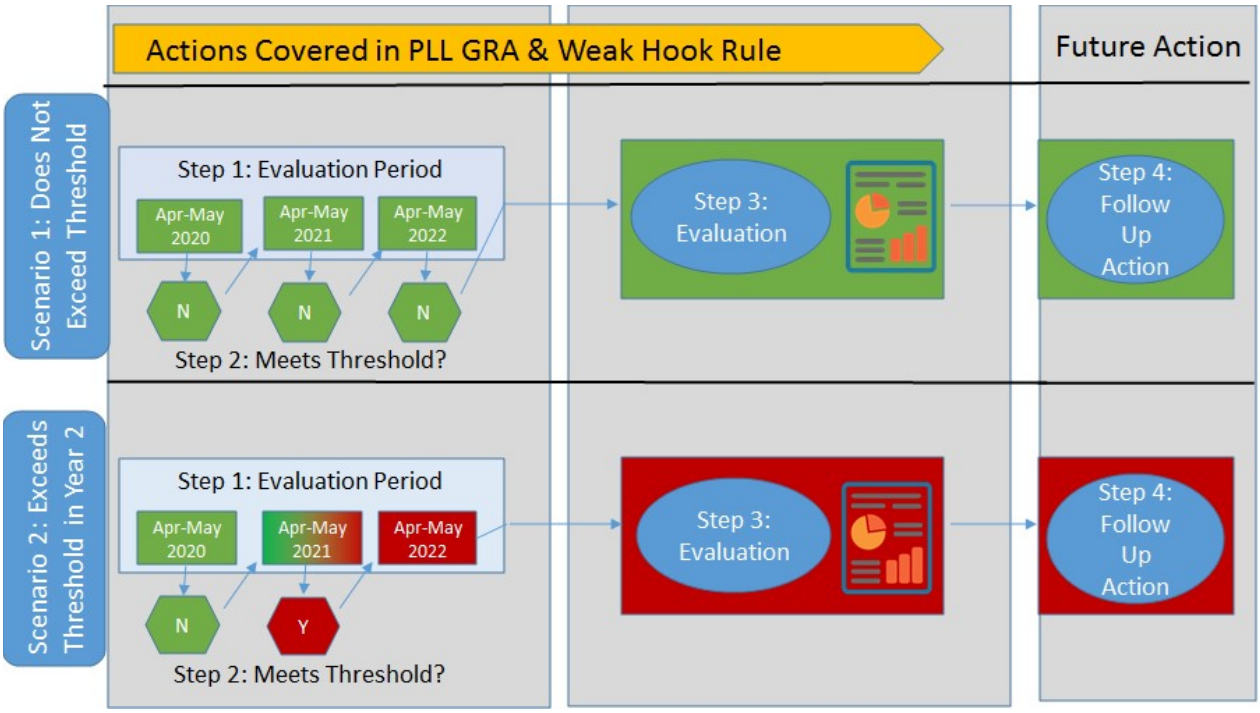

Figure 4.15 Two Scenarios Depicting the Evaluation Process for the Spring Gulf of Mexico Monitoring Area

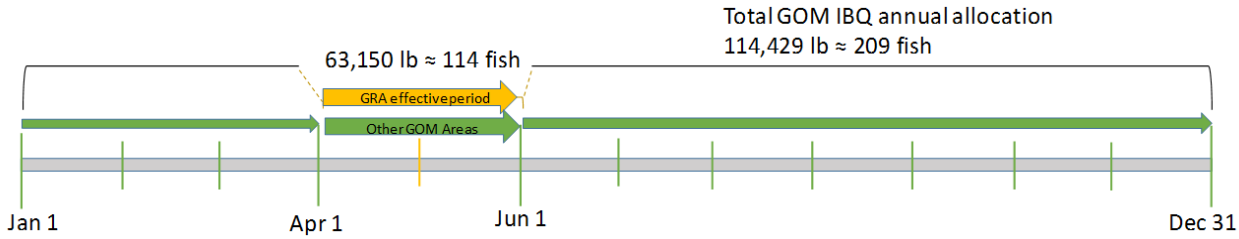

Figure 4.16 Threshold for the Spring Gulf of Mexico Pelagic Longline Monitoring Area Equivalent to the Annual Allocation Issued to Vessels that Fished During the Months of April and May from 2015 through 2017

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 (n = 142,757) 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 65,194 hooks may be deployed within the Monitoring Area 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 catch-per-unit efforts for the month prior (March) and the month after (June) the Gear Restricted Areas are in

place to predict catch-per-unit efforts and catch numbers for the months of April and May. The catch-per-unit efforts for both months provide a range of catch that may be expected to occur during the months of April and May. The catch-per-unit efforts for March and June were derived from pelagic longline sets within the area of the Spring Gulf of Mexico Gear Restricted Areas in 2015 through 2017, which provide the best available data for the Gear Restricted Areas.

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 catch estimated is comparable to current catches 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 Area while it is effective. However, if they hit the threshold, they would still have the option of leasing additional Gulf of Mexico IBQ allocation from other Gulf of Mexico IBQ shareholders. 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.

As described under Alternative C2, 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.

The predicted range of bluefin tuna kept and discarded under this alternative is well below the threshold of 63,150 lb (equivalent to approximately 114 fish) set for the Spring Gulf of Mexico Monitoring Areas. 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.

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 Area was closed due to a threshold being hit, it 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 catches 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, as in Alternative C2 (Table 4.25), 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 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 mitigative measures to minimize bluefin tuna bycatch via the threshold and evaluative aspects of the program. 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.

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

This alternative would remove the Spring Gulf of Mexico Gear Restricted Areas 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 by removing regulations related to the Spring Gulf of Mexico Gear Restricted Areas, 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 catches of target species from the open area of the Gulf of Mexico fall within the range of predicted catches, with the exception of a predicted lower number of swordfish kept. As described under the socioeconomic impacts, 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, this analysis does not predict adverse impacts to bluefin tuna or target species 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 by removing regulations related to the Spring Gulf of Mexico Gear Restricted Areas, 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), 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. 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 by removing regulations related to the Spring Gulf of Mexico Gear Restricted Areas, 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 2017 was $627,842. The predicted range of total average annual revenue under this alternative would be $501,799 to $626,885. 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, despite the predicted decrease in overall revenue. 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.

Recently, 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 scoping for this rulemaking, NMFS received comments both in favor and opposed to relieving the weak hook restrictions.

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 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 pelagic longline weak hook requirement year-round 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 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. 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., swordfish, blue marlin, white marlin) in the 2018 Atlantic HMS SAFE report (Table 3.4). 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. 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 a gear restricted area (the "Spring Gulf of Mexico Gear Restricted Area", 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. This measure 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). 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. 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.

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 these 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 or consequent rate of incidental interactions of blue marlin, white marlin, sailfish, or swordfish discards (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

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, even though the catch rates of legally sized swordfish did in fact decrease with weak 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 Southeast Fisheries Science Center (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) and catch-per-unit effort (Figure 4.18) 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 limits by reducing their catch of Bluefin tuna. The number of bluefin tuna interactions decreased substantially before (2012-2014) and after (2015 through 2017) implementation of the IBQ program. However, the patterns of interactions by month remained similar over time with more interactions happening from January through June than in the second half of the year (Figure 4.17).

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.

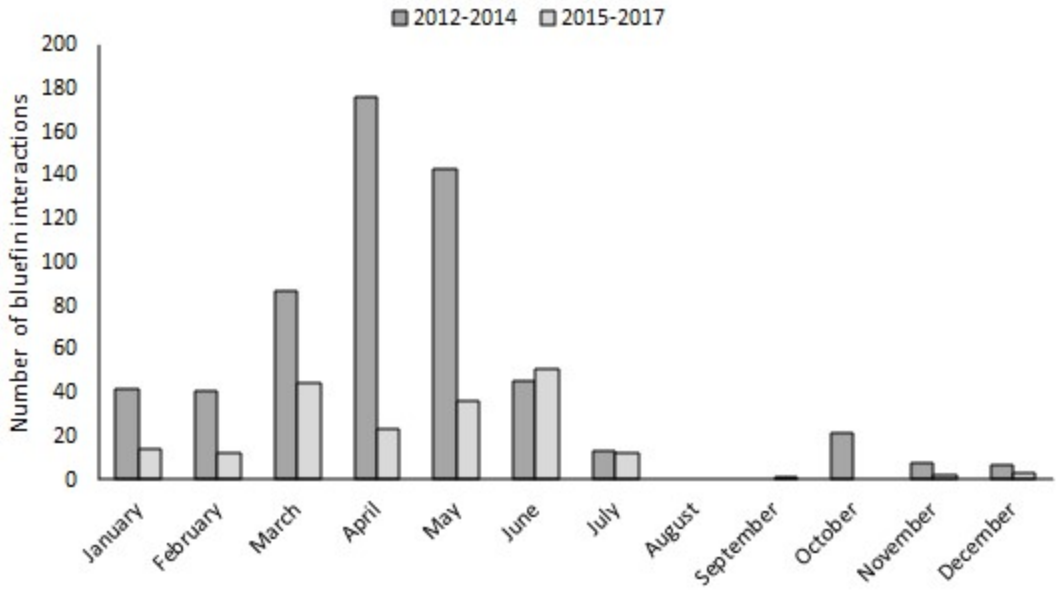

Figure 4.17 Bluefin Interactions with the Pelagic Longline Fishery in the Gulf of Mexico EEZ and Adjacent High Seas

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 catch-per-unit effort 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, the adverse impacts of weak hook use on white marlin and roundscale spearfish 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 would be allowed to fish with the thicker gauge circle hooks that they used prior to 2011. Alternative D2 would likely result in less use of 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 some 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.

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). 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.

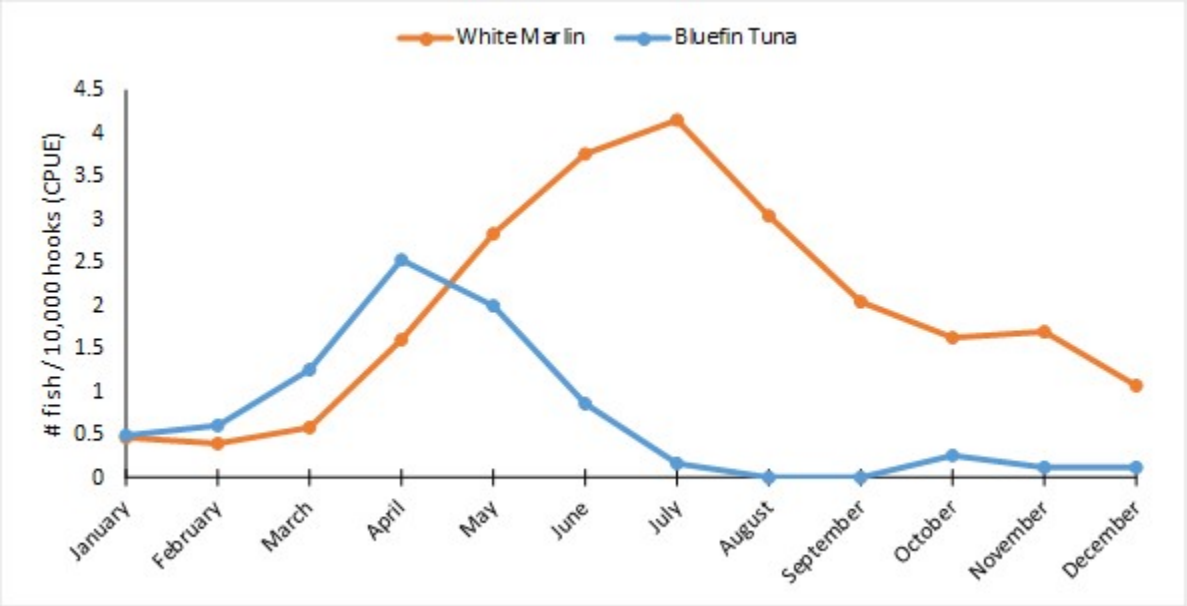

Figure 4.18 Bluefin and white marlin CPUE (# fish/10,000 hooks deployed) in the Gulf of Mexico (EEZ and high seas), 2015-2017

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 circle hook sales 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 catch-per-unit effort 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 is preferring 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 reduced 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., swordfish, blue marlin, white marlin) before and after weak hook implementation in the 2018 Atlantic HMS SAFE report (Table 3.4). 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 3.4) might double the required quota usage to account for bluefin landings and dead discards. However, even with this increase in landings and dead discards, the pelagic longline fleet would likely still remain within its designated quota due to individual accountability under the IBQ System Distribution and amount of 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 Southeast Fisheries Science Center 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. It is logical to assume that 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 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 catch-per-unit effort 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.

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.

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 are 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, 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. 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 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 mortality 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 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 (see Appendix A: Summary of Comments from Scoping for a summary of comments). 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 Alternatives 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 Alternatives 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 1.0, 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). A comprehensive list of all actions annually can be found in Chapter 1 of the HMS SAFE Report.

Table 5.1 Recent Major Actions within HMS Fisheries that May Affect Pelagic Longline and HMS Fishermen Dealing with Bluefin

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
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 31677	7/9/2018	Final Rule to Revise Atlantic HMS Shark Fishery Closure Regulations
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 Fishery Management Plan 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 Fishery Management Plan 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 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 Atlantic HMS Fishery Management Plan
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 implement measures to address commercial fisheries regulations related to the use of weak hooks and the management of areas previously closed for bluefin tuna. Commercial fishermen with pelagic longline gear would be subjected to modified requirements for access to pelagic longline Closed Areas and a gear restricted area, 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 designed to help remove regulatory redundancy and decrease the regulatory burden for fisherman targeting bigeye, albacore, yellowfin, skipjack tunas and swordfish; optimize the ability of the pelagic longline fleet to harvest target species quotas; and continue to minimize bycatch and bycatch mortality for bluefin tuna and other Atlantic HMS. The preferred alternatives reflect the best balance of the rulemaking objectives. 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 to the 2006 Consolidated Atlantic HMS FMP (79 FR 71510; December 2, 2014) (Amendment 7). 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; implemented measures applicable to the pelagic longline fishery, including IBQs, two new gear restricted areas, 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 electronic monitoring 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 remove or modify the gear restricted area 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 IBQs have reduced the amount of landings and dead discards of bluefin tuna and are 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 because this action would remove or modify some regulations that are redundant with IBQs.

- 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 Atlantic 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 (84 FR 5358). 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. 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 electronic monitoring system on board the vessel. Recreational measures would increase the minimum size limit for retention of shortfin mako sharks from 54 inches FL (straight line) to 71 inches FL for males and 83 inches FL 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 Atlantic HMS FMP (Amendment 13). 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 IBQs, 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 DEIS and Amendment 13 depend on the scope and nature of alternatives developed for Amendment 13.

- In May 2019, NOAA Fisheries published a scoping document that considers options to perform research and collect data in support of spatial Atlantic HMS fisheries management. 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 DEIS 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 Pelagic 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 6 to 10 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 DEIS 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 2.0 and a detailed discussion of ecological impacts for each alternative can be found in Chapter 4.0. 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 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 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. 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 were already granted access to the gear restricted area and this

alternative would not greatly increase effort or catches 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 United States Monitoring Area for a three year evaluation period. The Agency will closely monitor the area, 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 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. 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. 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 Gulf of Mexico Monitoring Areas would be closed to pelagic longline fishing. If the threshold is not met while the Monitoring Areas 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. 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.

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 mortality in the Gulf of Mexico is currently capped 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 with weak hooks.

5.3 Cumulative Social and Economic Impacts

Each alternative is described in Chapter 2.0 and a detailed discussion of socioeconomic impacts for each alternative can be found in Chapter 4.0.

Under preferred Alternative A4, for a three year 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 usage would apply to limit bluefin tuna landings and dead discards within the Monitoring Area. This alternative would increase flexibility in fishing areas, potentially result in shorter trips and lower fuel costs, and thus potentially increase fishing profits. 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 previously denied access to the area access by removal. 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 which would authorize pelagic longline vessels access the Spring Gulf of Mexico United States 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. This alternative would increase flexibility in fishing areas and areas with higher target catch catch-per-unit efforts. Thus, direct, short- and long-term, 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. Bluefin tuna mortality in the Gulf of Mexico is currently capped by the IBQ Program. 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 4.0.

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 4.0).

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 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 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. 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 Pelagic Longline Monitoring Area would be closed to pelagic longline fishing. The inseason and annual evaluation period monitoring and resulting evaluation report would in effect result in a mitigation measure against excessive bycatch levels of all Atlantic HMS and protected species, including white marlin, in the Northeastern United States Monitoring Area. 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 granted access to the gear restricted area. Those that are denied access may only have been denied temporarily, i.e., a single year, before being granted access 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 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 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 functionally redundant layers of regulation and year-to-year uncertainty associated with access decisions. 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 Closed 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 Northeastern United States Pelagic Longline Monitoring Area. 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 Pelagic Longline Monitoring Area would be closed to pelagic longline fishing. The inseason and annual Evaluation Period monitoring and resulting Evaluation Report would in effect result in a mitigation measure against excessive bycatch levels of all species in the Spring Gulf of Mexico Monitoring Areas. This alternative would have short- and long-term direct neutral socioeconomic impacts. This is because changes to the Closed Area 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.

5.6.4 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 Closed Area 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 dead discards (i.e., weak hooks, the Cape Hatteras and Gulf of Mexico Gear Restricted Areas, and the NE 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 Atlantic 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 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.

6.2 Description of the Fishery

Please see Chapter 3.0 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 redundant in effect; 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 6 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 will 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 will be lower than the revenue generated under Alternative A4 and A5.

Alternative A4: Evaluate 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 GRA 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 Areas.	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 will 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 Gear Restricted Areas. If not all vessels meet the performance criteria, the fishing revenue from this alternative will be lower than the revenue generated under Alternative C3 or C4.
Alternative C3: Evaluate the Spring Gulf of Mexico Gear Restricted Areas (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 slight reduction in trip length and associated fuel costs.	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 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 Areas	Since this alternative would allow access to all vessels by removing regulations related to the Spring Gulf of Mexico Gear Restricted Areas, the short-term economic impacts would be the same as presented in the preferred alternative, C3. 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	Fishing revenue impacts for this alternative are expected to be neutral despite the predicted decrease in overall revenue.

	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 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. 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 by reducing the number of captured bluefin tuna that would be counted against their IBQ, so there is some risk that switch away from weak hooks could increase costs associated with IBQ 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 beneficial 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. 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 by reducing the number of captured bluefin tuna that would be counted against their IBQ.

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 Initial Regulatory Flexibility Analysis

The Initial Regulatory Flexibility Analysis (IRFA) 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 an IRFA are also included in other Chapters of this document. Therefore, this IRFA incorporates by reference the economic analyses and impacts in Chapter 4 of this document.

7.1 Description of the Reasons Why Action is Being Considered

Please see Chapter 1 for a description of the reasons why action is being considered for the proposed action.

7.2 Statement of Objectives of, and Legal Basis for, the Proposed Rule

Section 603(b)(2) of the RFA requires Agencies to state the objective of, and legal basis for the proposed action. Please see Chapter 1 for a full description of the objectives of this action.

The objectives of this rulemaking, consistent with the objectives of the 2006 Consolidated Atlantic 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 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.

The evaluation of some current area-based and gear management measures 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 redundant in effect; and requests from the public and HMS Advisory panel members to reduce regulatory burden and remove duplicative regulations. Evaluation of these regulations is consistent with Section 303(b)(2)(C), 16 USC 1853(b)(2)(C) of the Magnuson-Stevens Act.

7.3 Description and Estimate of the Number of Small Entities to Which the Proposed Rule Would Apply

Section 603(b)(3) of the Regulatory Flexibility Act requires Agencies 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 SBA's 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 (FR), which NMFS did on December 29, 2015 (80 FR 81194, December 29, 2015). In this final rule 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 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 permit holders, 85 pelagic longline vessels were actively fishing in 2016 based on logbook records.

NMFS has determined that the preferred alternatives 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.

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 603(b)(4) of the RFA requires Agencies 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 Identification of All Relevant Federal Rules Which May Duplicate, Overlap, or Conflict with the Proposed Rule

Under section 603(b)(5) of the RFA, Agencies must identify, to the extent practicable, relevant Federal rules which duplicate, overlap, or conflict with the proposed action. Fishermen, dealers, and managers in these fisheries must comply with a number of international agreements, domestic laws, and other fishery management measures. These include, but are not limited to, the Magnuson-Stevens Act, the Atlantic Tunas Convention Act, the High Seas Fishing Compliance Act, the Marine Mammal Protection Act, the Endangered Species Act, the National Environmental Policy Act, the Paperwork Reduction Act, and the Coastal Zone Management Act. This proposed action has been determined not to duplicate, overlap, or conflict with any Federal rules.

7.6 Description of Any Significant Alternatives to the Proposed Rule That Accomplish the Stated Objectives of the Applicable Statutes and That Minimize any Significant Economic Impact of the Proposed Rule on Small Entities

One of the requirements of an IRFA is to describe any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities. The analysis shall discuss significant alternatives such as:

1. Establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities.
2. Clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small entities.
3. Use of performance rather than design standards.
4. Exemptions from coverage of the rule, or any part thereof, for small entities.

These categories of alternatives are described at 5 U.S.C. § 603 (c)(1)-(4)). NMFS examined each of these categories of alternatives. Regarding the first, second, and fourth categories, NMFS cannot establish differing compliance or reporting requirements for small entities or exempt small entities from coverage of the rule or parts of it because all of the businesses impacted by this rule are considered small entities and thus the requirements are already designed for small entities. NMFS did incorporate performance standards when developing several of the area-based alternatives. As described below, NMFS analyzed several different alternatives in this proposed rulemaking, and

provides rationales for identifying the preferred alternatives to achieve the desired objectives. The alternatives considered and analyzed are described below.

7.6.1 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 1st through June 30th 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 $42,942. Since 14 vessels operated in this area in June between 2015 and 2017, the average annual revenue per vessel during this time period was $3,067. This alternative would maintain the recent landings levels and corresponding revenues, resulting in neutral direct economic impacts to these small entities.

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 (2015-2017) did not have bluefin interactions. Total average annual revenue for bluefin tuna and target species in June of 2015 through 2017 was $42,942. The predicted range of total average annual revenue under this alternative would be $35,394. Since 14 vessels operated in this area in June between 2015 and 2017, the average annual revenue per vessel during this time period was $2,528. 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 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 lowers their fishing revenue. Most revenue from bluefin tuna and target species would come from the open reference area since much of the effort would still be predicted to occur there.

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 on where to fish to optimize target catch while minimizing bycatch of Atlantic HMS. An unquantified benefit of this alternative is 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. 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.

Alternative A3 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.

Total average annual revenue for bluefin tuna and target species in June of 2015 through 2017 was $42,942, which is on average $3,067 per vessel for the 14 vessels fishing in that area. The predicted range of average annual revenue per vessel during this time period under this alternative would be $1,442 to $2,525. Revenue from some species is predicted to decrease during the month of June, particularly for bluefin 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 despite the predicted decrease in overall revenue. 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 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 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 Closed 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.

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" (i.e., the "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 that would prohibit fishing if the fleet had to use IBQ allocation in exceedance of an established threshold to account for bluefin landings or dead discards to account for bluefin landings or dead discards. The Monitoring Area would remain open to pelagic longline fishing from June 1 to June 30 each year (previously, the area was closed to pelagic longline fishing during this time). 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. 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 Pelagic Longline Monitoring Area would be closed to pelagic longline fishing.

Following the evaluation period, NMFS would conduct an evaluation of data collected from the Monitoring Area. As part of this evaluation, NMFS would compile a report that would determine if a future rulemaking is necessary to modify the management of the Monitoring Area after the three year evaluation period. As discussed in Chapters 2 and 4, the status of the Monitoring Area following the three-year evaluation period is dependent on whether the threshold has been reached.

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 these areas remain open after three years, long-term impacts would be expected to be the same as short-term impacts.

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.

7.6.2 Cape Hatteras Gear Restricted Area

Alternative B1, the No Action 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.

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 gear restricted area. During the 2018-2019 effective period, 97 vessels (~34.5 percent) had data available for analysis. Approximately 85 percent of active vessels were granted access to the gear restricted area in the 2018-2019 effective period. Only one vessel denied access to the GRA in 2018 due to bluefin tuna avoidance issues had previously fished within the gear restricted area in recent years (data not shown to protect data confidentiality).

Since implementation of the IBQ program in 2015, revenue in the gear restricted area for top target species has increased despite higher numbers of participants being excluded in later years. This is to be expected as fishermen adjust business practices to the gear restricted area and IBQ programs,

and have become more familiar with leasing markets. During its effective period (December through April, 2015 to 2017), sets made within the gear restricted area contributed approximately 8.9 percent of the revenue generated for swordfish, 24.5 percent of the revenue from bigeye tuna, and 15 percent of the revenue from bluefin tuna.

Retaining the gear restricted area is likely to have neutral economic impacts fleet-wide, as the majority of vessels 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.

Alternative B2 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. 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 had access to the area and continued to fish in it following implementation of Amendment 7 management measures. Vessels recently denied access (for the 2018-2019 effective period) to the gear restricted area fished in a variety of locations between 2015 and 2017. Many of these vessels did not make sets within this area either prior to implementation or after implementation when access was granted. 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 functionally redundant layers of regulation and year-to-year uncertainty associated with access decisions. It may also provide a small number of fishermen with more options regarding fishing locations. The gear restricted area is situated in a location where wintertime fishing activities are largely depending 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.

7.6.3 Spring Gulf of Mexico Gear Restricted Areas

Alternative C1, the No Action alternative, This alternative would maintain the current restrictions regarding the Spring Gulf of Mexico Gear Restricted Areas at § 635.2 and § 635.21(c)(2)(vi). NMFS would maintain current restrictions which prohibit fishing to all vessels with pelagic longline gear onboard from April 1through May 31 each year (vessels may transit the area if gear is properly stowed). Average annual revenue for bluefin tuna and target species combined during this time period from 2015 to 2017 was $627,842, and given there were 46 pelagic longline vessels active in the Gulf of Mexico during that time period the average vessel generated $13,649. This alternative would maintain the recent landings levels and resulting revenues, resulting in neutral direct economic impacts.

Alternative C2 would apply performance based access to the Spring Gulf of Mexico Gear Restricted Areas. . 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 three pelagic longline vessels associated with Gulf of Mexico IBQ shares have been excluded from 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 be excluded from the Spring Gulf of Mexico Gear Restricted Areas under this alternative. Therefore, given this trend in access determinations, at least 94 percent of vessels with Gulf of Mexico IBQ would be expected to have access to the Spring Gulf of Mexico Gear Restricted Areas under this alternative.

Average annual revenue per vessel for bluefin tuna and target species in April and May of 2015 through 2017 was $13,649. The predicted range of average annual revenue per vessel under this alternative would be $10,909 to $13,628. 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 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 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.

Long-term impacts on these species would depend on future trends in performance based access to the Spring Gulf of Mexico Gear Restricted Areas. 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.

Alternative C3, the preferred alternative, alternative would convert the "Spring Gulf of Mexico Gear Restricted Area" to a monitoring area, called the "Spring Gulf of Mexico Monitoring Area" (i.e., the "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 the NMFS under a four-step process that would prohibit fishing if the fleet had to use IBQ allocation in exceedance of an established threshold to account for bluefin landings or dead discards 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 Northeastern United States Pelagic Longline Monitoring Area. 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 Pelagic Longline Monitoring Area would be closed to pelagic longline fishing.

Following the evaluation period, NMFS would conduct an evaluation of data collected from the Monitoring Area. As part of this evaluation, NMFS would compile a report that would determine if a future rulemaking is necessary to modify the management of the Monitoring Area after the three year evaluation period. As discussed in Chapters 2 and 4, the status of the Monitoring Area following the three-year evaluation period is dependent on whether the threshold has been reached.

Average annual revenue per vessel for bluefin tuna and target species in April and May of 2015 through 2017 was $13,649. The predicted range of average annual revenue per vessel under this alternative would be $10,909 to $13,628. 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 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 productive fishing grounds 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 economic 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.

Alternative C4 would remove the Spring Gulf of Mexico Gear Restricted Areas. Since this alternative would allow access to all vessels by removing regulations related to the Spring Gulf of Mexico Gear Restricted Areas, the short-term socioeconomic impacts would be the same as presented in the preferred Alternative C3. Average annual revenue per vessel for bluefin tuna and target species in April and May of 2015 through 2017 was $13,649. The predicted range of average annual revenue per vessel under this alternative would be $10,909 to $13,628. 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 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. 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 economic impacts would be expected to be the same as short-term impacts.

7.6.4 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, 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 D1 would not change the current weak hook requirements in the Gulf of Mexico pelagic longline fishery, thus, economic impacts on small entities

would be neutral. However, this alternative would not 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.

Alternative D2, the preferred 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 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. 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 by reducing the number of captured bluefin tuna that would be counted against their IBQ. NMFS prefers this alternative at this time because it increase fishermen's flexibility and helps fishermen manage their IBQ by reducing the number of captured bluefin tuna that would be counted against their IBQ. 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.

Under Alternative D3, NMFS 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. 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 permit's IBQ, 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. 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 catch rates and associated fishing mortality.

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 Stock Assessment and Fishery Evaluation (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 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.

NMFS. 2008. Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species, 2008. Silver Spring MD: U.S. Department of Commerce, National Marine Fisheries Service. 446 pp.

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.

NMFS. 2012. Stock Assessment and Fishery Evaluation (SAFE) Report for Atlantic Highly Migratory Species, 2012. Silver Spring MD: U.S. Department of Commerce, National Marine Fisheries Service. 203 pp.

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

An FMP or FMP amendment along with any implementing regulations 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 National Standard 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. 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 Atlantic Tunas Convention Act.

The preferred alternatives would help to achieve optimum yield for target species, such as swordfish and yellowfin tuna, by increasing opportunities and flexibility in locations where 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 DEIS 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 GRA/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. 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 DIES represent the best available science.

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 International Commission for the Conservation of Atlantic Tunas (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, the preferred Northeastern United States Closed Area and Spring Gulf of Mexico Gear Restricted Area alternatives, Alternatives A4 and C3, would undertake a review process to evaluate the continued need for the Northeastern United States Closed 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 recently denied access 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 DEIS 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.

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 a proven 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.

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 will be submitted for review by the responsible state agencies under section 307 of the CZMA.

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.

NMFS. 2008. Final Amendment 2 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks, and Highly Migratory. NOAA, National Marine Fisheries Service, Highly Migratory Species Management Division, Silver Spring, MD. Public Document.

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.

NMFS. 2012. 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. 203 pp.

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:

- Nicolas Alvarado, Fishery Management Specialist
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- Carrie Soltanoff, Fishery Management Specialist
- Thomas Warren, Fishery Management Specialist

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 Advisory Panel will be consulted on this draft action at the 2019 Spring HMS Advisory Panel Meeting. Hard copies were also provided to anyone who requested 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 (Alan Risenhoover, Margo Schulze-Haugen, Anjanette Riley, Kris Gamble, and Rey Marquez).
- NOAA General Counsel (Megan Walline, Loren Remsberg)
- NMFS NEPA (Steve Leathery and Cristi Reid).

Comments on the proposed rule and the draft environmental impact statement will be accepted for at least 60 days from the date of publication of the proposed rule in the Federal Register. An HMS Advisory Panel meeting and numerous public hearings will be held along the Atlantic and Gulf of Mexico coasts. HMS stakeholders that are unable to attend these meetings, or that wish additional opportunities to discuss the materials with staff, will be invited to attend at least one public webinar. Councils and commissions will be notified when the rulemaking materials are available and hard copies of those materials will be sent if requested.

The Federal Register notice and the EIS, and any necessary addenda will also be made available to the public via the HMS webpage.

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Appendices

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 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 spatiotemporal changes to the NE Closure.
- 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 Pelagic Longline 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

- 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; IBQ 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 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 due to: administrative burden; unrealistic to get real-time, accurate reporting; disaster set could undermine 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 GOM.
- 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.

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 C.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 (-46 percent change, statistically significant at $p<0.05$)(Table C.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 C.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 C.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.

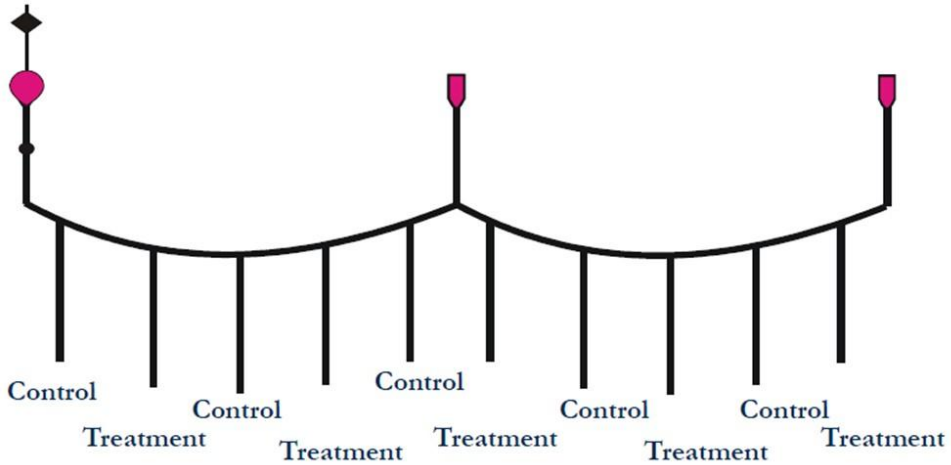

Figure C.1 Experimental Gear Configuration for 2008–2010 Comparison of Standard Circle Hooks and Weak Hooks

Table C.1 Catch Comparisons from Gulf of Mexico Exprimental 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	0.02283
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.

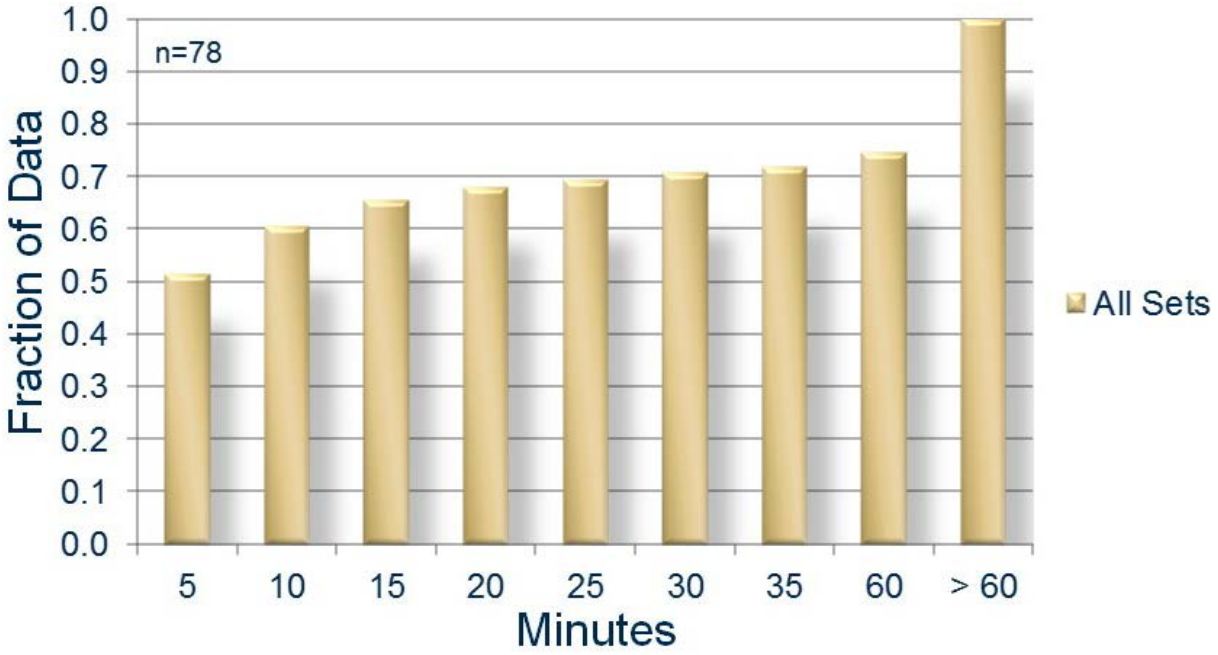

Figure C.2 Quartile Plot Showing Time of Release Data for Straightened Hooks with Temperature/Depth Recorders

Data Source: D. Foster, Southeast Fisheries Science Center, unpublished data.

Table C.2 Pelagic Longline CPUE and Interactions with HMS Before (2008–2010) and After (2011–2016) Implementation of the Gulf of Mexico Weak Hook Requirement

Species	2008–2010 Average Annual CPUE	2011–2016 Average Annual CPUE	2008–2010 Average Annual Interactions	2011–2016 Average Annual Interactions
Bluefin tuna	0.152	0.064	301	126
Swordfish	3.883	4.504	8,366	7,636
Yellowfin tuna	6.525	9.740	15,025	16,704
Blue marlin	0.109	0.156	272	273
White marlin	0.112	0.211	298	370

Source: HMS logbook data.