

CHAPTER 5 TABLE OF CONTENTS

Chapter 5 Table of Contents	5-i
5.0 Mitigation and Unavoidable Impacts	5-2
5.1 Mitigation Measures	5-5
5.2 Unavoidable Adverse Impacts	5-7
5.3 Irreversible and Irretrievable Commitment of Resources.....	5-7

5.0 MITIGATION AND UNAVOIDABLE IMPACTS

Ecological Impacts Summary of the Preferred Alternatives

The management measures in preferred alternative suite 4: *Research Set Aside Allowing Small Directed LCS Fishery*, are not likely to have significant adverse ecological impacts to target and non-target species. All issues considered are either predicted to result in neutral or positive ecological impacts. The preferred alternative suite would reduce mortality of shark species based on the results of previous shark assessments (for a thorough description of the most recent assessments, please refer to Chapter 3). The preferred alternative suite would also reduce mortality of sea turtles and other protected species.

In alternative suite 4, the *Quotas/Species Complexes* measure would have positive ecological impacts on all shark species. Establishing the quotas and species complexes as described in alternative suite 4 would maintain a level of fishing effort that would allow sandbar shark stocks to rebuild, end overfishing of this stock, and maintain the current status of blacktip sharks which are not overfished. Allocating the sandbar quota solely among vessels operating within a research fishery while allowing non-sandbar large coastal sharks (LCS) to be caught by vessels operating within and outside a research fishery, was constructed to maintain proper quota levels in order to rebuild these species based on recommendations from the most recent LCS stock assessment. Structuring the fishery in this way would continue to provide valuable data on these shark stocks necessary for the effective management of these species while still allowing a limited number of vessels to remain active in the fishery.

In alternative suite 4, the *Retention Limits* measure would have positive ecological impacts on sandbar and dusky sharks. Only vessels participating in the research fishery would be allowed to land sandbar sharks. This reduction in fishing effort is anticipated to result in a more than 80-percent decrease in sandbar landings. Even though discards of sandbar sharks could occur after the sandbar quota is reached and non-sandbar LCS are still being caught, the sandbar shark quota reduction of over 80 percent compared to the status quo, would keep all landings plus discards of sandbar sharks below the recommended sandbar total allowable catch (TAC) of 158.3 mt dw. Since the vessels participating in the research fishery would be targeting sharks, it is assumed that discards of dusky sharks would also occur. However, the number of pelagic longline (PLL) vessels that can land sandbar sharks would be limited by the research fishery, so it is anticipated that the PLL vessels would not set bottom longline (BLL) gear for sharks, leading to an anticipated 72 percent decrease of dusky shark discards compared to the status quo.

The *Retention Limits* measure would also have positive ecological impacts for non-sandbar LCS. Since vessels with directed shark permits are expected to target non-sandbar LCS because of the reduced retention limits compared to the status quo, it is anticipated that a 6-percent decrease in non-sandbar LCS landings will occur. Retention limits of non-sandbar LCS for incidental permit holders would stay the same compared to current retention limits. Therefore, discards of non-sandbar LCS are not anticipated to increase for incidental permit holders, leading at least a 60-percent decrease in non-sandbar LCS discards. Possession and

landing of porbeagle sharks would continue to be authorized in commercial and recreational sectors, however, the quota would be reduced for this species. The current quota for porbeagle sharks is 92 mt dw/year, whereas, the preferred alternative would reduce the overall TAC for commercial and recreational fisheries to 11.3 mt dw/year. This would result in a commercial quota of 1.7 mt dw. This revised TAC is not expected to alter existing fishing effort because the existing quota has never been met. However, it may reduce fishing effort in the future due to a considerable reduction in commercial quota. Porbeagle sharks are primarily caught on PLL gear and the United States has had minimal landings of this species.

In alternative suite 4, the *Time/Area Closures* measure would have positive ecological impacts on target and non-target species as well as protected species, marine mammals, and essential fish habitat. Maintaining the time/area closures as they have been implemented in recent years would further the positive ecological effects that have been observed such as the reduction of bycatch of prohibited, non-prohibited, and non-target HMS species. The closure areas specific to BLL gear have also been effective in reducing dusky and neonate and juvenile sandbar shark interactions and, in the Caribbean, could have positive ecological impacts to essential fish habitat (EFH), mutton snapper, red hind, and other reef-dwelling species (see Section 4.1.3). In addition, maintaining current gillnet restrictions could have positive ecological impacts on endangered right whales. Marine Protected Areas (MPAs) being implemented by the South Atlantic Fishery Management Council (SAFMC) and included in the preferred alternative suite may also have positive ecological impacts by limiting fishing effort with BLL gear in areas that are habitat for species included in the snapper grouper fishery management plan.

In alternative suite 4, the *Reporting* measure would have positive and/or neutral ecological impacts. Increasing observer coverage in the shark research fishery would have positive ecological impacts because it would improve the quantity and quality of data obtained from the commercial shark fishery. These data would be used to monitor landings, bycatch, and interactions with protected resources in near “real-time.” Requiring that all shark dealer reports are actually *received* by the Agency in a more timely fashion would provide more frequent reports of shark landings in order to better assess quantities of sharks landed and whether or not a closure or other management measures are warranted to prevent overfishing. This may decrease the likelihood that extensive overharvests of sharks would occur, resulting in neutral or slightly positive ecological impacts.

In alternative suite 4, the *Seasons* measure would result in neutral ecological impacts. Coupled with more restrictive retention limits, this measure may spread shark fishing effort across a larger portion of the calendar year. Since all sandbar sharks and most of the non-sandbar LCS would be landed by a limited number of vessels participating in the research fishery, NMFS would have more information regarding when sandbar and non-sandbar LCS quotas would likely be reached. The *Regions* measure would result in positive ecological impacts. Implementing two regions for non-sandbar LCS in the final amendment was chosen over maintaining three regions or implementing one region because the two regions scheme would account for overharvests more equitably, account for the unique species composition in the Gulf of Mexico and Atlantic regions, maintain consistency with the blacktip shark stock assessment, and provide flexibility to make modifications when an interstate Coastal Shark Management plan is adopted by states adjacent to the Atlantic Ocean. Maintaining two regions is not likely to

provide any significant ecological benefits for shark species, bycatch, or protected resources because having two regions does not directly impact fishing effort. Quotas, retention limits, and authorized species are the primary means of affecting fishing effort. However, it would give the Agency the flexibility to implement more specific regulations in individual regions that are better suited to the fishery within each region.

In the preferred alternative suite, the *Recreational Measures* would result in positive ecological impacts. Allowing recreational anglers to possess species that are easy to identify, while prohibiting retention of species that are frequently misidentified with sandbar and dusky sharks (*i.e.*, silky sharks), would remove the possibility that a recreational angler might misidentify and actually land a species that is overfished or experiencing overfishing. This would decrease the possibility that sandbar and dusky sharks are landed, as they are sometimes mistaken for species that are not overfished or experiencing overfishing.

Alternative suite 4 would result in positive ecological impacts to protected resources and EFH. The *Quotas/Species Complexes* and *Retention Limits* measures would significantly reduce the number of trips, thus reducing fishing effort. These measures, in combination with other measures such as *Reporting* and increasing observer coverage for the research fishery, may result in increased data collection on protected resources and EFH. In addition, the reduction in usage of BLL gear would reduce impacts to complex habitats, such as coral reefs in the Caribbean or areas with soft corals in the Gulf of Mexico.

Ecological impacts of conducting stock assessments at least every five years could be neutral or slightly positive (Alternative 7). Releasing the annual SAFE report in the fall every year is not expected to have any ecological impacts (Alternative 9).

Social and Economic Impacts Summary of the Preferred Alternatives

All management measures in preferred alternative suite 4: *Research Set Aside Allowing Small Directed LCS Fishery*, are likely to have negative economic impacts on fishermen and the associated communities because retention limits would be decreased, only vessels participating in the shark research fishery would be allowed to land sandbar sharks, and quotas would be reduced. However, NMFS believes that alternative suite 4 strikes a balance between the positive ecological impacts that must be achieved in order to rebuild stocks and end overfishing while minimizing the severity of economic impacts that will occur as a result.

In alternative suite 4, the *Quotas/Species Complexes* and *Retention Limits* measures would have negative economic consequences for fishermen. Based on the limited number of boats that could fish for sandbar sharks in the research shark fishery, most current directed and incidental permit holders would be prohibited from landing sandbar sharks. However, directed and incidental permit holders outside the research fishery would still be able to land non-sandbar LCS, small coastal sharks (SCS), and pelagic shark species. From 2008 until December 31, 2012, directed permit holders would be allowed to retain 33 non-sandbar LCS per vessel per trip with no trip limits for SCS or pelagic sharks. Incidental permit holders would be allowed to retain 3 non-sandbar LCS and 16 SCS and pelagic sharks combined per vessel per trip. As of January 1, 2013, the non-sandbar LCS trip limit from directed permit holders would increase to

36 non-sandbar LCS per vessel per trip. Trip limits for incidental permit holders would stay the same. The reduced retention limits coupled with the fact that only vessels selected to participate in the shark research fishery would be able to land sandbar sharks is expected to curtail the directed shark fishery. However, commercial shark permit holders outside the research fishery could possess a reduced number of sharks while pursuing other species with longline or gillnet gear.

The *Time/Area Closures* measure in the preferred alternative suite would have neutral to negative economic consequences. This measure would maintain the status quo in addition to implementing 8 additional MPA closures in the South Atlantic. These additional 8 MPAs would be closed to BLL gear which could have negative economic impacts. However, the overall impact of these closures in comparison to other measures being preferred by this alternative, such as reduced quotas and retention limits, is anticipated to be minor.

In alternative suite 4, the *Reporting* measures would have neutral economic impacts. Shark dealers would still be required to submit landings reports twice a month. Additional burden is not expected as a result of changing the pertinent date of post-marking to receipt by the Agency.

The, *Seasons* and *Regions* measures in alternative suite 4 would result in negative economic impacts to fishermen and dealers in the North Atlantic region. Opening the seasons on January 1 in all regions would provide benefits to vessels in the South Atlantic and Gulf of Mexico regions as a larger variety of LCS and SCS are present there year-round. The North Atlantic fishermen may have to redistribute effort to another region which may not be cost effective with reduced quotas and retention limits for sandbar and non-sandbar LCS.

The *Recreational Measures* would result in negative economic impacts. Recreational fishermen may not be as willing to go shark fishing if the number of species that can be retained is reduced and Charter/Headboat operators may see a reduction in the amount of charters that customers are willing to hire. The preferred alternative would allow recreational anglers to land tiger, blacktip, spinner, bull, lemon, nurse, great hammerhead, smooth hammerhead, and scalloped hammerhead sharks as well finetooth, blacknose, Atlantic sharpnose, and bonnethead sharks and pelagic sharks (porbeagle, oceanic whitetip, blue, common thresher, and shortfin makos). This is expected to mitigate economic impacts compared to the proposed measures which would have prevented recreational fishermen from retaining blacktip, spinner, bull, finetooth, blacknose, and porbeagle sharks.

Measures contained in alternative 7 to modify the timing of stock assessments would result in variable economic impacts depending on the results of forthcoming stock assessments. Alternative 9, concerning the timing of the release of the annual Stock Assessment and Fishery Evaluation report (SAFE report) would not have any economic impacts.

5.1 Mitigation Measures

No mitigation measures were specifically considered for the preferred alternative suite, Alternative suite 4, and its corresponding management measures regarding *Quotas/Species Complexes, Retention Limits, Time/Area Closures, Reporting, Seasons, Regions, Recreational*

Measures, and *Protected Resources and EFH*. This is because the preferred alternative suite was specifically selected to mitigate potential adverse impacts. As a result, mitigation was explicitly addressed in the analyses conducted for selecting the preferred alternative suite in other sections of this FEIS including Chapters 4, 6, 7, 8, and 9. NMFS would monitor the impacts of the management measures in the preferred alternative suite and would consider other mitigation measures in the future as necessary.

As stated above, mitigation measures were explicitly addressed in the analyses conducted for selecting the management measures in the preferred alternative suite. For example, in analyzing possible quotas and retention limits, the preferred research fishery approach was selected because it balances the need to end overfishing based on recent assessments, while allowing a limited number of vessels to direct on sharks and provide scientific data on the status of shark stocks for future management actions. To mitigate some of these impacts, directed and incidental permit holders outside of the research fishery would still be allowed to land non-sandbar LCS, SCS, and pelagic sharks. The quotas and retention limits in the preferred alternative suite complies with the mandate to end overfishing, while still providing a reasonable opportunity to target sharks and harvest the allocated quota. It also provides additional information on shark species, bycatch, protected resources, and EFH which are all necessary for management of the fishery.

Similarly, for time/area closures, other than implementing the 8 MPAs at the request of the SAFMC, NMFS is maintaining the current time/area closures and has opted not to implement additional large closures that were considered as an option to reduce overall fishing mortality.

For dealer reporting, requiring all dealer reports to be *received* by the Agency within ten days of the end of the reporting period would provide clarity and eliminate ambiguities regarding late reporting, without imposing additional, more stringent reporting requirements that were also considered as an option in other alternative suites.

For seasons, the preferred measure to open on January 1 and close within 5 days notice of quotas being 80 percent filled should balance the need to predict landings for non-research vessels with the security of knowing what the research vessels are landing. In addition, implementing two regions is preferred over maintaining three regions because it follows the recommendation of the blacktip shark assessments, it allows for equitable accounting of overharvests, and will allow for better coordination with the interstate shark plan that is being developed by the Atlantic States Marine Fisheries Commission (ASMFC). Finally, requiring recreational anglers to land species that are easily identifiable would balance the need to end overfishing with the needs of the recreational constituency.

In summary, while many of the actions taken in this amendment impose additional restrictions on the shark fishery, NMFS specifically selected alternatives that minimize economic impacts while accomplishing the mandate to end overfishing and implement a rebuilding plan for overfished shark stocks.

5.2 Unavoidable Adverse Impacts

In general, there are no unavoidable adverse impacts expected as a result of the preferred alternative suite and corresponding management measures of *Time/Area Closures*, *Reporting*, *Seasons*, *Regions*, *Recreational Measures*, and *Protected Resources and EFH*. NMFS would continue to monitor the impact of the management measures in the preferred alternative suite and would propose additional management measures, as necessary, to avoid any unanticipated adverse impacts. No unavoidable adverse impacts are expected as a result of stock assessment frequency or SAFE report release as described in alternatives 7 and 9, respectively. Economic impacts may vary depending on the findings of future stock assessments, but these are not considered unavoidable adverse effects of Alternative 7.

However, there are unavoidable adverse socioeconomic impacts as a result of the preferred alternative suite and corresponding management measures of *Quotas/Species Complexes* and *Retention Limits*. NMFS must administer and operate under the National Standards of the Magnuson-Stevens Act which includes a mandate to prevent overfishing and rebuild overfished stocks. In trying to maintain shark stocks and meet the Magnuson-Stevens Act mandate of ending overfishing, NMFS would significantly reduce fishing effort under the preferred alternative suite. This might result in directed and incidental shark permit holders and dealers redirecting to other fisheries and/or leaving the fishing industry due to lowered quotas, thus decreasing effort and landings. Participants in recreational shark fisheries may experience negative economic impacts as a result of reducing the number of sharks that could be legally landed. Charter/Headboat operators would be most affected as a result of these measures as they may see a reduction in the number of charters that customers are willing to hire. In addition, reporting burden would be increased significantly for Atlantic shark dealers as a result of this alternative suite resulting in negative economic impacts. While the increased reporting burden would not impact shark dealer expenditures per se, it would result in more time spent submitting dealer reports, which represents an opportunity cost for fishermen since that would be time they could not spend conducting other activities related to their business. In the analyses for selecting the preferred alternative suite, NMFS had determined that the management measures in alternative suite 4 are necessary in order to comply with the Magnuson-Stevens Act mandate to end overfishing. In addition, the preferred alternative suite has been determined to be the most feasible alternative to rebuild shark stocks according to the most recent assessments.

As described above, in aggregate, the preferred alternative suite and its corresponding management measures are expected to have positive or neutral conservation benefits for shark species, bycatch species, and protected resources. This is because the preferred alternative suite was specifically selected to mitigate any potential adverse impacts. Any resulting economic or social impacts, beyond those described above, are unavoidable.

5.3 Irreversible and Irrecoverable Commitment of Resources

The management measures in the preferred alternative suite would not result in any irreversible and irretrievable commitment of resources. There are expected to be positive ecological impacts because of reduced trip limits and commercial sandbar quota for the Atlantic shark fishery. Because of this, the Agency expects fishing effort and bycatch levels to decrease. The preferred alternative suite could increase observer coverage levels, depending on available

funding, and provide more documentation of interactions with bycatch and protected resources. These data would assist the Agency in developing additional management measures in the future that may further reduce any deleterious impacts from shark fisheries on bycatch and protected resources.