CHAPTER 5 TABLE OF CONTENTS

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 was designed to 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 was also designed to 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 and end overfishing of this stock as well as 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 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 yield an 84 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 targeted, this would be offset by the proposed sandbar shark quota reduction of 82 percent compared to the status quo, which would keep all landings plus discards of sandbar sharks below the recommended sandbar TAC of 116 mt dw. Since the vessels participating in the research fishery would be directing on sharks, it is assumed that discards of dusky sharks would occur. However, the number of 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 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 have neutral ecological impacts for non-sandbar LCS and porbeagle sharks. Since all vessels with incidental or directed shark permits could target non-sandbar LCS, but under a reduced quota compared to the status quo, this is anticipated to result in a 7 percent decrease in non-sandbar LCS landings. Retention limits of non-sandbar LCS for incidental permit holders are larger than past retention limits. Therefore, discards of non-sandbar LCS are not anticipated to occur for incidental permit holders, leading to an anticipated 72 percent decrease in non-sandbar LCS discards. Possession and landing of porbeagle sharks would be prohibited in commercial and recreational sectors. This prohibition,

coupled with reductions in the amount of effort with BLL gear would not change the numbers of porbeagle landed, as these sharks are primarily targeted with 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 in 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 EFH, mutton snapper, red hind, and other reef-dwelling species (see Section 4.1.3). Maintaining current gillnet restrictions could have positive ecological impacts on endangered right whales.

In alternative suite 4, the *Reporting* measure would have positive ecological impacts. Requiring that all 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 would decrease the likelihood that extensive overharvests of sharks would occur. In addition, increasing observer coverage to 100 percent for vessels in the research fishery would be used to monitor landings, bycatch, and interactions with protected resources in near "real-time."

In alternative suite 4, the *Seasons* measure would result in neutral ecological impacts. Having one season rather than three seasons may result in most of the landings occurring early in the year. This should not have a negative ecological impact as most pupping occurs in the spring or early summer. 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 some information regarding when sandbar and non-sandbar LCS quotas would likely be reached. The *Regions* measure would also result in neutral ecological impacts. Implementing one region was chosen over maintaining three regions because, under potential reduced fishing effort, it is not likely that maintaining regions would provide any ecological benefits for shark species, bycatch, or protected resources.

In the preferred alternative suite, the *Recreational* measures would result in positive ecological impacts. Requiring recreational anglers to possess species that are easy to identify while prohibiting retention of species that are frequently misidentified with sandbar and dusky 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, dusky, and porbeagle 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 if these are areas in which sharks would be targeted.

Social and Economic Impacts Summary of the Preferred Alternatives

All management measures in preferred alternative suite 4: *Research Set Aside Allowing Small Directed LSC Fishery*, are likely to have neutral or negative economic impacts on fishermen and the associated communities. However, NMFS believes that alternative suite 4, strikes a balance between positive ecological impacts that must be achieved 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, SCS, and pelagic shark species.

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. This would be especially true in areas where blacktip sharks are more frequently encountered, as well as areas where other sandbar and dusky look-alike sharks are frequently encountered.

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 any 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 DEIS 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 may balance 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 proposed 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 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 an option in other alternative suites.

For seasons, the preferred measure to open on January 1 and close within 5 days notice of any quota being 80 percent filled may balance the need to predict landings for non-research vessels with the security of knowing what the research vessels are landing. In addition, implementing one region was chosen over maintaining three regions because it is not likely that maintaining regions would provide any ecological benefits for shark species, bycatch, or protected resources. Finally, requiring recreational anglers to land species that are easily identifiable is proposed to 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.

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 and thus decreased effort and landings. Participants in recreational shark fisheries would 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 Irretrievable Commitment of Resources

The management measures in the preferred alternative suite would not result in any irreversible and irretrievable commitment of resources. There may be some minor ecological impacts because the Atlantic shark fishery would still remain open, however, the Agency expects fishing effort and bycatch levels to decrease considerably because of the reduced quotas and retention limits being proposed. The preferred alternative suite would increase observer coverage levels 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.