

## CHAPTER 2 TABLE OF CONTENTS

<b>Chapter 2 Table of Contents</b> .....	<b>2-i</b>
<b>Chapter 2 List of Tables</b> .....	<b>2-ii</b>
<b>Chapter 2 List of Figures</b> .....	<b>2-iii</b>
<b>2.0 Summary of the Alternatives</b> .....	<b>2-1</b>
2.1 Commercial Measures .....	2-3
2.1.1 SCS Commercial Quotas .....	2-3
2.1.2 Commercial Gear Restrictions.....	2-8
2.1.3 Pelagic Shark Effort Controls.....	2-9
2.2 Recreational Measures.....	2-11
2.2.1 Small Coastal Sharks .....	2-11
2.2.2 Pelagic Sharks.....	2-13
2.3 Smooth Dogfish .....	2-15
2.4 Alternatives Considered But Not Further Analyzed.....	2-21

## CHAPTER 2 LIST OF TABLES

Table 2.1	An overview of all the alternatives considered in draft Amendment 3 to the 2006 Consolidated HMS FMP.....	2-1
Table 2.2	Framework showing potential for quota changes for blacknose and non-blacknose SCS if fishermen are able to target specific species of sharks.....	2-7
Table 2.3	Framework showing potential for quota changes for blacknose and non-blacknose sharks if fishermen are not able to target specific species of sharks. ....	2-7
Table 2.4	Total Annual Landings by Year and Summary Data spanning 1998-2007.....	2-19

## CHAPTER 2 LIST OF FIGURES

Figure 2.1	Neonate blacknose shark interactions.....	2-23
Figure 2.2	Juvenile blacknose shark interactions.....	2-24
Figure 2.3	Neonate and juvenile blacknose interactions relative to the 20 fathom line.....	2-25
Figure 2.4	Observed BLL sets from 1994-2007 relative to the 20 fathom line. ....	2-26
Figure 2.5	Observed BLL sets from 1994-2007 relative to the 50 fathom line. ....	2-27



## 2.0 SUMMARY OF THE ALTERNATIVES

As described in Chapter 1, NMFS is considering various shark management measures to meet the objectives of the Magnuson-Stevens Act and the 2006 Consolidated HMS FMP based on the 2007 stock assessments for SCS, and the 2008 ICCAT pelagic shark stock assessment. The DEIS for Amendment 3 to the Consolidated HMS FMP was published on July 24, 2009 (74 FR 36891) and NMFS held nine public hearings. While some of the alternatives considered in the DEIS were modified in the final stage of Amendment 3 to the 2006 Consolidated HMS FMP, the overall list of issues to be addressed has not changed. This document includes a full range of reasonable alternatives designed to meet the purpose and need for action described in Chapter 1 and address public comments received during the DEIS stage. Table 2.1 gives an overview of all the alternatives considered and indicates changes to quotas and preferred alternatives from the DEIS to FEIS. The preferred alternatives in this document considered all of the comments received from the public during the draft stage. The environmental, economic, and social and socio-economic impacts of these alternatives are discussed in later chapters.

**Table 2.1 An overview of all the alternatives considered in draft Amendment 3 to the 2006 Consolidated HMS FMP**

Issue	Alternative	Alternative Description
SCS Commercial Quotas	Alternative A1	No Action. Maintain the existing SCS quota and species complex
	Alternative A2	Establish a new SCS quota of 221.6 mt dw and a blacknose quota of 12.1 mt dw *
	Alternative A3	Establish a new SCS quota of 110.8 mt dw and a blacknose quota of 19.9 mt dw; allow all current authorized gears for sharks*
	Alternative A4	Establish a new SCS quota of 55.4 mt dw and a blacknose quota of 15.9 mt dw; remove shark gillnet gear as an authorized gear for sharks *
	Alternative A5	Close the SCS fishery
	Alternative A6	<i>Establish a new SCS quota of 221.6 mt dw and a blacknose quota of 19.9 mt dw; allow all current authorized gears for sharks- Preferred Alternative **</i>
Commercial Gear Restrictions	Alternative B1	<i>No Action. Maintain current authorized gears for commercial shark fishing – Preferred Alternative **</i>
	Alternative B2	Close shark gillnet fishery; remove gillnet gear as an authorized gear type for commercial shark fishing
	Alternative B3	Close the gillnet fishery to commercial shark fishing from South Carolina south, including the Gulf of Mexico and the Caribbean Sea
Commercial Pelagic Shark Effort Controls	Alternative C1	No Action. Keep shortfin mako sharks in the pelagic shark species complex and maintain the quota
	Alternative C2	Remove shortfin mako sharks from pelagic shark species quota and establish a shortfin mako quota
	Alternative C3	Remove shortfin mako sharks from pelagic shark species complex and place this species on the prohibited shark species list
	Alternative C4	Establish a commercial size limit for shortfin mako sharks

<b>Issue</b>	<b>Alternative</b>	<b>Alternative Description</b>
	Alternative C4a	Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of female shortfin mako sharks reach sexual maturity or 32 inches interdorsal length (IDL)
	Alternative C4b	Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of male shortfin mako sharks reach sexual maturity or 22 inches IDL
	Alternative C5	<i>Take action at the international level to end overfishing of shortfin mako – Preferred Alternative</i>
	Alternative C6	<i>Promote the release of shortfin mako sharks brought to fishing vessels alive – Preferred Alternative</i>
Recreational Measures for SCS	Alternative D1	<i>No Action. Maintain the current recreational retention and size limits for SCS - Preferred Alternative **</i>
	Alternative D2	Modify the minimum recreational size limit for blacknose sharks based on their biology
	Alternative D3	Increase the retention limit for Atlantic sharpnose sharks based on current catches
	Alternative D4	Prohibit retention of blacknose sharks in recreational fisheries
Recreational Measures for Pelagic Sharks	Alternative E1	No Action. Maintain the current recreational retention and size limits for shortfin mako sharks
	Alternative E2	Increase the recreational minimum size limit of shortfin mako sharks
	Alternative E2a	Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of female shortfin mako sharks reach sexual maturity or 108 in FL
	Alternative E2b	Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of male shortfin mako sharks reach sexual maturity or 73 inches FL
	Alternative E3	<i>Take action at the international level to end overfishing of shortfin mako sharks– Preferred Alternative</i>
	Alternative E4	<i>Promote the release of shortfin mako sharks brought to fishing vessels alive – Preferred Alternative</i>
	Alternative E5	Prohibit retention of shortfin mako sharks in recreational fisheries (catch and release only)
Smooth Dogfish	Alternative F1	No Action. Do not add smooth dogfish under NMFS management
	Alternative F2	<i>Add smooth dogfish under NMFS Management and establish a federal permit requirement - Preferred Alternative</i>
	Alternative F2 a1	Establish a smooth dogfish quota that is equal to the average annual landings from 1998-2007 (431.1 mt dw)
	Alternative F2 a2	Establish a smooth dogfish quota equal to the maximum annual landings from 1998-2007 (576.1 mt dw)
	Alternative F2 a3	Establish a smooth dogfish quota equal to the maximum annual landings from 1998-2007 plus one standard deviation (645.8 mt dw)
	Alternative F2 a4	<i>Establish a smooth dogfish quota equal to the maximum annual landings from 1998-2007 plus two standard deviation (715.5 mt dw) – Preferred Alternative **</i>
	Alternative F2 b1	<i>Establish a separate smooth dogfish set-aside quota for the exempted fishing program– Preferred Alternative</i>
	Alternative F2 b2	Establish a smooth dogfish set-aside quota for the exempted fishing program and add it to the current 60 mt ww set-aside quota for the exempted fishing program

<b>Issue</b>	<b>Alternative</b>	<b>Alternative Description</b>
	Alternative F3	Add smooth dogfish under NMFS management and mirror management measures implemented in the ASMFC Interstate Shark FMP
Alternatives Considered But Not Further Analyzed	Alternative G1	Establish species-specific quotas for all species in the SCS complex based on average landings; close each quota individually, as needed
	Alternative G2	Establish new time/area closures in blacknose shark nursery areas for all HMS gears
	Alternative G3	Close waters inshore of 20 fathoms in the Gulf of Mexico to shark bottom longline gear
	Alternative G4	Close waters inshore of 50 fathoms in the Gulf of Mexico to shark bottom longline gear
	Alternative G5	Add deepwater sharks to the management unit and place these species on the prohibited list
	Alternative G6	Establish catch shares in the Atlantic shark fisheries
* Indicates changes in SCS and blacknose quota levels from DEIS to FEIS		
** Indicates changes in preferred alternatives from DEIS to FEIS		

## 2.1 Commercial Measures

### 2.1.1 SCS Commercial Quotas

The 2007 blacknose shark stock assessment estimated that blacknose sharks would have a 70 percent probability of rebuilding by 2027 with a TAC of 19,200 individuals per year. To achieve this TAC, NMFS would need to reduce overall blacknose mortality by at least 78 percent across all fisheries that interact with blacknose sharks. NMFS determined the number of blacknose sharks that could be taken in the Atlantic commercial shark fishery to achieve a 78 percent mortality reduction. The result is a commercial allowance of 7,094 blacknose sharks that could be taken (landed and discarded) within the Atlantic commercial shark fishery while still allowing the blacknose sharks to rebuild as outlined in Chapter 1. A description of the calculations used to calculate the quota allowed under each alternative is described in Appendix A

Alternative A1          No Action. Maintain the existing SCS quota and species complex

Under alternative A1, the No Action alternative, NMFS would maintain the existing commercial quota for SCS of 454 mt dw. This quota would be used to account for landings of any of the four species in the SCS complex: finetooth, Atlantic sharpnose, bonnethead, and blacknose sharks. Regulations regarding quota over and underharvests adjustments would not change under this alternative.

Alternative A2          Establish a new SCS quota of 221.6 mt dw and a blacknose commercial quota of 12.1 mt dw

As a result of updated data and public comment, the quotas under alternative A2 changed from the DEIS to FEIS stage. In the DEIS, alternative A2 would remove blacknose sharks from the SCS quota and created a blacknose shark-specific quota and a separate non-blacknose SCS quota. The non-blacknose SCS quota would apply to finetooth, Atlantic sharpnose, and bonnethead sharks. The current SCS quota is 454 mt

dw, and the average landings of blacknose sharks from 2004 – 2007 is 61.5 mt dw. Under this alternative in the DEIS, NMFS subtracted the average landings of blacknose sharks from the SCS quota to establish a new non-blacknose SCS quota of 392.5 mt dw ( $454 - 61.5 = 392.5$ ). NMFS then reduced the average landings of blacknose sharks by 78 percent to establish a blacknose quota of 13.5 mt dw ( $61.5 * .78 = 47.97 - 61.5 = 13.5$ ).

In the FEIS, based in part on updated data (see Appendix A), NMFS revised the quotas in alternative A2. The revised alternative A2 would still establish a non-blacknose SCS quota for finetooth, Atlantic sharpnose, and bonnethead sharks. However, rather than subtracting the average blacknose shark landings from the SCS quota, as proposed in the DEIS, the revised non-blacknose SCS quota would be based on the average landings of finetooth, Atlantic sharpnose, and bonnethead sharks from 2004 – 2008, 221.6 mt dw. This change in approach is due, in part, to be consistent with the 2007 SCS stock assessment that indicated that, while none of those three species are currently overfished, or undergoing overfishing, fishing mortality should not be increased. With regards to blacknose sharks, the quota under alternative A2 in the DEIS was based on average landings from 2004 – 2007. The revised blacknose quota was calculated as it was in the DEIS but is based on the average landings of blacknose sharks of 55 mt dw from 2004-2008. Therefore, the revised blacknose quota under alternative A2 would be a 78-percent reduction of 55 mt dw, or 12.1 mt dw ( $55 * .78 = 42.9 - 55 = 12.1$ ).

Alternative A3            Establish a new SCS quota of 110.8 mt dw and a blacknose commercial quota of 19.9 mt dw; allow all current authorized gears for sharks

Similar to alternative A2, as a result of updated data and public comment, the quotas under alternative A3 changed from the DEIS to FEIS stage. In the DEIS, alternative A3 removed blacknose sharks from the SCS quota and created a blacknose shark-specific quota and a separate non-blacknose SCS quota. In the DEIS, the non-blacknose SCS quota would have been 42.7 mt dw, an 82 percent reduction from the average landings of finetooth, Atlantic sharpnose, and bonnethead sharks from 2004 – 2007. The blacknose shark quota would have been 16.6 mt dw, which was the amount of blacknose sharks that would have been harvested while the non-blacknose SCS quota was harvested. In addition, fishermen with an incidental LAP would have been prohibited from retaining blacknose sharks.

Based on updated data and public comment (see Appendix A), alternative A3 has been revised. The analyses used to calculate these revised quotas are essentially the same as those used in the DEIS. The changes are mainly due to revised average weight data, particularly for the gillnet fishery, and public comment that resulted in analyses indicating that gillnet fishermen appear to be able to target and avoid certain species of sharks. Therefore, the revised alternative A3 would set the non-blacknose SCS quota at 110.8 mt dw, which is a 50 percent reduction of the average landings of 221.6 mt dw from 2004-2008 for finetooth, Atlantic sharpnose, and bonnethead sharks. The revised blacknose shark quota would be 19.9 mt dw, which is the amount of blacknose sharks that would be harvested while the non-blacknose SCS quota is harvested. The revised alternative A3

would also allow fishermen with incidental permits to retain blacknose sharks when the fishing season is open.

Under alternative A3 it is assumed that fishermen with a directed shark LAP would fish for non-blacknose SCS in a directed fashion until the non-blacknose SCS quota and/or blacknose quota reaches 80 percent. At that time, both the non-blacknose SCS fishery and the blacknose shark fisheries would close. As described in Appendix A, NMFS determined that reducing the overall quota for the non-blacknose SCS fishery by 50 percent would reduce the level of blacknose shark discards such that the total blacknose shark mortality would stay below the allowance for the commercial fisheries

Alternative A4            Establish a new SCS quota of 55.4 mt dw and a blacknose commercial quota of 15.9 mt dw; remove shark gillnet gear as an authorized gear for sharks

Similar to alternatives A2 and A3, as a result of updated data and public comment, the quotas in alternative A4, the preferred alternative in the DEIS, changed from the DEIS to the FEIS stage. In the DEIS, alternative A4 removed blacknose sharks from the SCS quota and created a blacknose shark-specific quota and a separate non-blacknose SCS quota. In the DEIS, alternative A4 would have set the non-blacknose SCS quota at 56.9 mt dw. This quota was a 76 percent reduction from the average landings of finetooth, Atlantic sharpnose, and bonnethead sharks from 2004 through 2007. Also, NMFS would have established a blacknose-specific quota of 14.9 mt dw, which was the amount of blacknose sharks that would have been harvested while the non-blacknose SCS quota was harvested. Under alternative A4 in the DEIS gillnet gear would have been prohibited and fishermen with incidental LAPs would not have been authorized to retain blacknose sharks.

Based on updated data and public comment alternative A4 has been revised and is no longer the preferred alternative. The revised quota under alternative A4 would establish the non-blacknose SCS quota at 55.4 mt dw, which is a 75 percent reduction from the current landings of finetooth, Atlantic sharpnose, and bonnethead sharks from 2004 through 2008. A separate blacknose-specific quota would be set at 15.9 mt dw, which is the amount of blacknose sharks that would be harvested while the non-blacknose SCS quota of 55.4 mt dw is harvested. Gillnets would still be prohibited as an authorized gear in the SCS fishery under revised alternative A4. Fishermen with an incidental LAP would not be authorized to retain any blacknose sharks.

In addition, this alternative assumes that gillnet gear would not be used to harvest sharks under either alternative B2 or B3, and that fishermen would fish for SCS in a directed fashion until the non-blacknose SCS quota and/or blacknose quota reached 80 percent. At that time, both the non-blacknose SCS fishery and the blacknose shark fisheries would close

Alternative A5            Close the SCS fishery

Alternative A5 would close the SCS fishery in the Atlantic, Gulf of Mexico, and Caribbean for all fishermen until reopening was warranted based on new stock

assessments. Shark landings would be limited to pelagic sharks, non-sandbar LCS, sandbar sharks within the shark research fishery, and research and collection for public display within the HMS Exempted Fishing Permit Program. Also, shark landings would include smooth dogfish under alternative F2a4.

*Alternative A6            Establish a new SCS quota of 221.6 mt dw and a blacknose commercial quota of 19.9 mt dw; allow all current authorized gears for sharks – Preferred Alternative*

Alternative A6 is a new alternative that was added after the DEIS stage and is based on updated data, public comment, and additional analyses. NMFS believes that this new preferred alternative better reflects the intent of the previous preferred alternative, and remains within the range of considered alternatives. Alternative A6 combines alternatives A2 and A3. As described above in alternative A3, NMFS received public comment that gillnet fishermen could target and avoid certain species of sharks. Subsequent analyses of gillnet observer data indicates that this is a possibility. In addition to the gillnet observer data, NMFS also analyzed updated data on blacknose shark mortality rates and average sizes. Using this new information NMFS determined that under the revised alternative A3, as described above, 19.9 mt dw of blacknose sharks would be harvested when fishing for 110.8 mt dw of non-blacknose SCS. While NMFS assumes this ratio would continue, alternative A6 would give fishermen the opportunity to refine their techniques to target only non-blacknose SCS and would set the non-blacknose SCS quota equal to the average landings of non-blacknose SCS from 2004 through 2008. Therefore under alternative A6, the non-blacknose SCS quota would be set at 221.6 mt dw and the blacknose quota would be set at 19.9 mt dw. Also, under alternative A6 both the blacknose shark and non-blacknose SCS fisheries would close if either the blacknose or non-blacknose SCS quotas reach, or are projected to reach, 80 percent. Under alternative A6 all currently authorized commercial gears for sharks would be allowed.

Alternative A6 would be implemented in a framework mechanism that would give NMFS the flexibility to increase or decrease either the blacknose or non-blacknose SCS quotas based on the ability of fishermen to avoid blacknose sharks and target non-blacknose SCS, and/or any subsequent change in status based on new stock assessments of these species of sharks. For example, if fishermen were not able to avoid blacknose sharks, as demonstrated by continually filling the blacknose shark quota before the non-blacknose SCS quota, NMFS would reduce the non-blacknose SCS quota accordingly rather than accounting for underharvests of the non-blacknose SCS quota. Alternatively, if new stock assessments indicate that blacknose sharks are no longer overfished, the blacknose shark quota could be increased slightly pending new regulations based on the new stock assessment results. The basic framework is as follows.

*If gillnet fishermen were able to avoid and/or target certain species of sharks (as indicated by fishermen landing a ratio of at least 20 mt dw blacknose to 110 mt dw non-blacknose sharks):*

- If blacknose status improves, NMFS would increase the blacknose quota as appropriate and maintain non-blacknose SCS quota;

- If non-blacknose SCS status improves, NMFS would increase the non-blacknose SCS quota as appropriate and maintain blacknose quota;
- If blacknose status decreases, NMFS would reduce the blacknose quota as appropriate and maintain non-blacknose SCS quota; and
- If non-blacknose SCS status decreases, NMFS would reduce the non-blacknose SCS quota as appropriate and maintain blacknose quota.

**Table 2.2 Framework showing potential for quota changes for blacknose and non-blacknose SCS if fishermen are able to target specific species of sharks.**

Note: + = an increase in quota, 0 = status quo, - = a decrease in quota

Stock Status		Non-blacknose SCS: Improves	Non-blacknose SCS: Status quo	Non-Blacknose: Decreases
<b>Blacknose: improves</b>	Blacknose	+	+	+
	Non-blacknose SCS	+	0	-
<b>Blacknose: Status quo</b>	Blacknose	0	0	0
	Non-blacknose SCS	+	0	-
<b>Blacknose: Decreases</b>	Blacknose	-	-	-
	Non-blacknose SCS	+	0	-

*If gillnet fishermen were not able to avoid and/or target certain species of sharks (as indicated by fishermen landing a greater percentage of non-blacknose SCS compared to the ratio of 20 mt dw blacknose to 110 mt dw non-blacknose SCS):*

- If blacknose stock status improves, NMFS would increase the blacknose quota and maintain non-blacknose SCS quota, as appropriate;
- If non-blacknose SCS stock status improves, NMFS would maintain both quotas, pending stock assessments and resulting regulations;
- If blacknose status decreases, NMFS would reduce both the blacknose and non-blacknose SCS quota as appropriate; and
- If non-blacknose SCS stock status decreases, NMFS would reduce the non-blacknose quota as appropriate and maintain blacknose quota.

**Table 2.3 Framework showing potential for quota changes for blacknose and non-blacknose sharks if fishermen are not able to target specific species of sharks.**

Note: + = an increase in quota, 0 = status quo, - = a decrease in quota.

Stock Status		Non-blacknose SCS: Improves	Non-blacknose SCS: Status quo	Non-Blacknose: Decreases
<b>Blacknose: improves</b>	Blacknose	+	+	0
	Non-blacknose SCS	+	0	-
<b>Blacknose: Status quo</b>	Blacknose	0	0	0

Stock Status		Non-blacknose SCS: Improves	Non-blacknose SCS: Status quo	Non-Blacknose: Decreases
	Non-blacknose SCS	0	0	-
<b>Blacknose: Decreases</b>	Blacknose	-	-	-
	Non-blacknose SCS	-	-	-

### 2.1.2 Commercial Gear Restrictions

*Alternative B1*            *No Action. Maintain current authorized gears for commercial shark fishing – Preferred Alternative*

Under alternative B1, NMFS would maintain the current authorized gears for the commercial shark fishery in all regions where they are currently authorized. These gears are BLL, PLL, gillnet, rod and reel, handline, and bandit gear. This alternative would also maintain all the restrictions for the various gear types. For example, BLL vessels must carry corrodible hooks and the required safe handling, release and disentanglement equipment, and the sea turtle technical memorandum. In the shark gillnet fishery, gillnets must be less than 2.5 km and must remain attached to at least one vessel at one end. Net checks must be performed every 0.5 to 2 hours to look for and remove any entangled protected species. There are additional gillnet gear deployment restrictions for the southeast U.S. shark gillnet fishery in order to comply with various Take Reduction Plans (50 CFR part 229) consistent with the Marine Mammal Protection Act (MMPA). Requirements for smooth dogfish fishermen using gillnet gear are described in alternative F2. As described above in alternatives A2, A3, A4, and A6, based on revised data, public comments, and analyses, NMFS found that it may be feasible that gillnet fishermen can target certain species and avoid other species. As such, given the preferred alternative A6 above, NMFS now prefers this alternative

*Alternative B2*            *Close shark gillnet fishery; remove gillnet gear as an authorized gear type for commercial shark fishing*

Under alternative B2, NMFS would remove gillnet gear as an authorized gear type for commercial shark fishing. As such, this alternative would close the shark gillnet fishery in the Atlantic, Gulf of Mexico, and Caribbean. NMFS is considering this alternative because gillnet gear, and in particular, drift gillnet gear, is the predominant gear used to fish for the blacknose sharks in the South Atlantic region and removing this gear could result in large reductions in blacknose shark fishing mortality. This alternative would allow shark directed and incidental permit holders to continue to use other commercially authorized gears, such as BLL, rod and reel, handline or bandit gear, to harvest sharks.

Alternative B3            Close the gillnet fishery to commercial shark fishing from South Carolina south, including the Gulf of Mexico and the Caribbean Sea

Under alternative B3, NMFS would close the gillnet fishery to commercial shark fishing from South Carolina south, including the Gulf of Mexico and Caribbean Sea. This alternative would eliminate the predominant gear type used to harvest blacknose sharks in the South Atlantic region, and would help rebuild the blacknose shark stock by reducing gillnet mortality throughout their habitat range. Blacknose sharks are commonly found from North Carolina to Brazil, including the Gulf of Mexico and Caribbean Sea. This alternative would also help mitigate impacts of adding the smooth dogfish fishery under federal management (see alternatives F2 and F3), which uses gillnet gear predominately from North Carolina north. Under this alternative, NMFS would allow directed and incidental permit holders to use other authorized gear types besides gillnets to target sharks in the commercial shark fishery from South Carolina south. NMFS preferred this alternative in the DEIS, in part, to reduce blacknose mortality. However, as described above in alternatives A2, A3, A4, and A6, based on revised data, public comments, and analyses, NMFS found that there is a chance that gillnet fishermen can target certain species and avoid other species. As such, given the preferred alternative A6 above, NMFS no longer prefers this alternative.

### **2.1.3 Pelagic Shark Effort Controls**

Alternative C1            No Action. Keep shortfin mako sharks in the pelagic shark species complex and maintain the quota.

Under alternative C1, the No Action alternative, NMFS would maintain the current commercial shark fishing regulations that pertain to shortfin mako sharks established in the 2006 Consolidated HMS FMP. Shortfin mako sharks would remain in the pelagic shark species complex, which includes blue, common thresher, oceanic whitetip, and porbeagle sharks. The quota for pelagic sharks would remain the same, with 488 mt dw allocated for common thresher, oceanic whitetip, and shortfin mako sharks, 273 mt dw allocated for blue sharks, and 1.7 mt dw allocated for porbeagle sharks. Regulations regarding overharvest and underharvest of pelagic shark quota, and retention limits for pelagic sharks would remain the same.

Alternative C2            Remove shortfin mako sharks from pelagic shark species quota and establish a shortfin mako quota

Alternative C2 would remove shortfin mako sharks from the pelagic shark quota and would establish a species-specific quota for shortfin mako sharks based on current landings. Currently, the annual quota for common thresher, oceanic whitetip, and shortfin mako is 488 mt dw. Based on the average commercial landings of shortfin mako sharks from 2004-2007, the species-specific quota for shortfin mako sharks would be 72.5 mt dw (NMFS, 2008). The common thresher and oceanic whitetip sharks would be allocated a quota of 415.5 mt dw after removal of the shortfin mako quota of 72.5 mt dw (488 mt dw – 72.5 mt dw = 415.5 mt dw). The quotas for blue and porbeagle sharks would not change under this alternative and would be 273 mt dw and 1.7 mt dw, respectively. Regulations

regarding overharvest and underharvest of pelagic shark quota, and retention limits for pelagic sharks would remain the same.

Alternative C3            Remove shortfin mako sharks from pelagic shark species complex and place this species on the prohibited shark species list

Alternative C3 would remove shortfin mako sharks from the pelagic shark species complex and add them to the prohibited species list. Under the regulations, shark species can be added to the prohibited species list if two of the following four criteria are met: 1) There is sufficient biological information to indicate the stock warrants protection, such as indications of depletion or low reproductive potential or the species is on the ESA candidate list; 2) the species is rarely encountered or observed caught in HMS fisheries; 3) the species is not commonly encountered or observed caught as bycatch in fishing operations; or 4) the species is difficult to distinguish from other prohibited species (*i.e.*, look-alike issue). Adding shortfin mako sharks to the prohibited species list would make it illegal to retain or land shortfin mako shark commercially or recreationally. If the shortfin mako shark is placed on the prohibited species list, the average annual landings of shortfin mako sharks from 2004-2007 (72.5 mt dw) would be subtracted from the current annual quota for the pelagic shark quota group (488 mt dw), creating a quota of 415.5 mt dw for common thresher and oceanic whitetip sharks. Regulations regarding overharvest and underharvest of pelagic shark quota, and retention limits for pelagic sharks would remain the same.

Alternative C4            Establish a commercial size limit for shortfin mako sharks

Alternative C4a)        Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of female shortfin mako sharks reach sexual maturity or 32 inches interdorsal length (IDL)

Currently, there are no minimum size limits for sharks caught in the commercial fishery. Under alternative C4a, a commercial minimum size limit would be established for shortfin mako sharks to correspond with the size at which 50 percent of female shortfin mako sharks reach sexual maturity, calculated from Natanson *et al.* (2006) as 32 inches IDL, which is the straight line measurement from the base of the trailing edge of the first dorsal fin to the base of the leading edge of the second dorsal fin. Shortfin mako sharks less than 32 inches IDL could not be retained and would have to be discarded. Shortfin mako sharks greater than the 32 inch IDL size limit would be able to be retained and all landings would be counted against the appropriate quota for common thresher, oceanic whitetip, and shortfin mako sharks.

Alternative C4b)        Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of male shortfin mako sharks reach sexual maturity or 22 inches IDL

Under alternative C4b, a commercial minimum size limit would be established for shortfin mako sharks to correspond with the size at which 50 percent of male shortfin

mako sharks reach sexual maturity, calculated from Natanson *et al.* (2006) as 22 inches IDL. Currently, there are no minimum size limits for sharks caught in the commercial fishery. Shortfin mako sharks less than 22 inches IDL would be prohibited and could not be retained. All shortfin mako sharks greater than the 22 inch IDL limit would be available for commercial harvest and all landings would be counted against the appropriate quota.

*Alternative C5            Take action at the international level to end overfishing of shortfin mako sharks – Preferred Alternative*

Under alternative C5, NMFS would take action at an international level through international fishery management organizations to end overfishing of shortfin mako sharks. This plan would encompass the commercial fishery. ICCAT assumes there are three shortfin mako shark stocks for assessment purposes: northern and southern Atlantic stocks, separated at 5°N latitude and a Mediterranean stock. Based on the 2008 SCRS stock assessment on the North Atlantic shortfin mako population, NMFS independently determined that the North Atlantic stock of shortfin mako sharks is experiencing overfishing and approaching an overfished status. Any international measures adopted to end overfishing of the North Atlantic shortfin mako shark stock would be implemented domestically.

*Alternative C6            Promote the release of shortfin mako sharks brought to fishing vessels alive – Preferred Alternative*

Under this alternative, NMFS would actively engage in an outreach program with commercial fishermen and request that they release all shortfin mako sharks that come to the vessel alive in order to help prevent the shortfin mako shark population from becoming overfished. This action would not restrict commercial harvest of shortfin mako sharks that are alive at haulback, and quotas and retention limits would remain as described in the No Action alternative, alternative C1.

## **2.2 Recreational Measures**

### **2.2.1 Small Coastal Sharks**

*Alternative D1            No Action. Maintain the current recreational retention and size limit for SCS – Preferred Alternative*

In the DEIS, the preferred alternative was alternative D4, which would prohibit retention of blacknose shark in the recreational fishery. During the public comment period, NMFS received comments that if NMFS selected alternative D4, that some States would likely have to prohibit the retention of blacknose sharks in state waters. The comment stated that because some states have a well managed recreational fishery and conservation measures in place to adequately protect this species, prohibiting their retention was not necessary. Most blacknose sharks do not reach the current federal minimum size of 54 inches FL, therefore, it is presumed that most recreational blacknose shark landings currently occur in state waters, where size and retention limits for blacknose sharks may be less restrictive than federal regulations. In the Atlantic Ocean, under the

ASMFC Interstate Coastal Shark FMP there is currently no minimum size limits for blacknose sharks. Because the minimum size limit of 54 inches fork length (FL), acts as a de facto retention prohibition, and after evaluating public comments on the DEIS, NMFS decided to change the preferred alternative in the FEIS to alternative D1. However, NMFS would ask states to implement measures consistent with the current federal 54 inch FL size limit to help reduce recreational mortality in state waters and meet rebuilding targets for blacknose sharks. Depending on the results of the upcoming blacknose shark stock assessment, NMFS may consider prohibiting recreational retention of blacknose sharks in future actions.

Under the preferred alternative D1, NMFS would maintain the existing recreational retention limits for SCS. Recreational anglers are currently allowed one authorized shark species with a fork length (FL) greater than 54 inches, which includes SCS, per vessel per trip. Recreational fishermen are also able to retain one bonnethead shark and one Atlantic sharpnose shark per person per trip. There is no minimum size requirement for bonnethead and Atlantic sharpnose sharks.

Alternative D2            Modify the minimum recreational size limit for blacknose sharks based on their biology

Under alternative D2, NMFS would modify the minimum recreational size for blacknose sharks based on their reproductive biology. The current minimum retention size is 54 inches and is based on the reproductive biology of the sandbar shark. However, most blacknose sharks do not reach a maximum size of 54 inches FL. Under alternative D2, NMFS would reduce the minimum size limit for blacknose sharks to a minimum size of 36 inches FL, which is the size at which 50 percent of the female blacknose sharks reach sexual maturity.

Alternative D3            Increase the retention limit for Atlantic sharpnose sharks based on current catches

Under alternative D3, NMFS would increase the retention limit for Atlantic sharpnose sharks based on recent catch history and current stock status. Under current federal regulations, recreational anglers are allowed to retain one Atlantic sharpnose shark per person per trip. Under alternative D3, NMFS would consider increasing this retention limit based on the stock status of the species and current catches.

Alternative D4            Prohibit retention of blacknose sharks in recreational fisheries

Under alternative D4, NMFS would prohibit the retention of blacknose sharks in the recreational fishery. While recreational fishermen may still catch blacknose sharks when fishing for other species, they would not be permitted to retain blacknose sharks and would have to release them. Because most blacknose sharks do not reach the current federal minimum size of 54 inches FL, it is presumed that most recreational blacknose shark landings currently occur in state waters, where size and retention limits for blacknose sharks may be less restrictive than federal regulations. Complementary measures in state waters would be important for reducing mortality of blacknose shark in recreational

fisheries and ensuring the rebuilding plan is met for blacknose sharks. In the DEIS, this was the preferred alternative. However, because the *status quo* minimum size limit of 54 inches acts as a *de facto* retention prohibition and after evaluating public comments on the DEIS, NMFS decided to change the preferred alternative in the FEIS to alternative D1.

### 2.2.2 Pelagic Sharks

Alternative E1            No Action. Maintain the current recreational retention and size limits for shortfin mako sharks.

Under the No Action alternative, NMFS would maintain the current recreational retention and size limits for shortfin mako sharks. Shortfin mako sharks would remain in the pelagic shark species complex, which includes blue, common thresher, oceanic whitetip, and porbeagle sharks. Recreational fishermen would continue to be limited to one authorized shark species, which include shortfin mako sharks, greater than 54 inches FL per vessel per trip, and one Atlantic sharpnose and one bonnethead shark per person per trip with no minimum size.

Alternative E2            Increase the recreational minimum size limit of shortfin mako

Alternative E2a)        Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of female shortfin mako sharks reach sexual maturity or 108 inches FL

Under Alternative E2a, NMFS would increase the recreational minimum size limit for shortfin mako sharks to correspond with the size at which 50 percent of female shortfin mako sharks reach sexual maturity, identified in Natanson *et al.* (2006) as 108 inches FL. Currently, the minimum size limit for all pelagic sharks caught in the recreational fishery is 54 inches FL. Under this alternative, the shortfin mako shark recreational minimum size would be increased to 108 inches FL to help end overfishing of the stock. Shortfin mako sharks below this minimum size limit would be prohibited and could not be retained. Under this alternative, all shortfin mako sharks greater than the 108 inch FL minimum size limit would be authorized for retention. The 108 inch FL measurement is equivalent to the 32 inch IDL measurement used for implementing a commercial size limit in Alternative C4a, but the different measurements are used to accommodate the different fisheries. Recreational anglers would be limited to one shark greater than 54 inches FL or one shortfin mako greater than 108 inches FL per vessel per trip, and one Atlantic sharpnose and one bonnethead shark per person per trip.

Alternative E2b)        Establish a minimum size limit for shortfin mako sharks that is based on the size at which 50 percent of male shortfin mako sharks reach sexual maturity or 73 inches FL

The recreational minimum size limit would be increased for shortfin mako sharks under Alternative E2b to correspond with the size at which 50 percent of male shortfin mako sharks reach sexual maturity, identified in Natanson *et al.* (2006) as 73 inches FL. Currently, the minimum size limits for all pelagic sharks caught in the recreational fishery is 54 inches FL. The shortfin mako shark recreational minimum size would be increased to

73 inches FL to help end overfishing of the stock. Shortfin mako sharks caught below this size limit would be prohibited and could not be retained. The 73 inch FL measurement is equivalent to the 22 inch IDL measurement used for implementing a commercial size limit in Alternative C4b, but the different measurements are used to accommodate the different fisheries. All shortfin mako sharks greater than 73 inches FL and all other pelagic sharks greater than 54 inches FL limit would be available for recreational harvest. Recreational anglers would be limited to one shark greater than 54 inches FL or one shortfin mako greater than 73 inches FL per vessel per trip, and one Atlantic sharpnose and one bonnethead shark per person per trip.

*Alternative E3            Take action at the international level to end overfishing of shortfin mako sharks – Preferred Alternative*

Under alternative E3, NMFS would take action at an international level through international fishery management organizations to end overfishing of shortfin mako sharks. As discussed under alternative C5, ICCAT assumes there are three shortfin mako shark stocks for assessment purposes: northern and southern Atlantic stocks, separated at 5°N latitude and a Mediterranean stock. Any international measures adopted to end overfishing of the North Atlantic shortfin mako shark stock would be implemented domestically.

*Alternative E4            Promote the release of shortfin mako sharks brought to fishing vessels alive – Preferred Alternative*

The promotion of the live release of shortfin mako sharks in the recreational shark fishery, as considered in alternative C6, would not result in any changes to the current recreational regulations regarding shortfin mako sharks. Under this alternative, NMFS would actively engage in an outreach program with recreational fishermen and request that they release all shortfin mako sharks that come to the boat alive in order to help prevent the North Atlantic shortfin mako shark population from becoming overfished. This action does not restrict recreational harvest of shortfin mako sharks that are alive at haulback, and bag limits would remain as described in the No Action alternative, alternative E1.

*Alternative E5            Prohibit retention of shortfin mako sharks in recreational fisheries (catch and release only)*

Under alternative E5, NMFS would prohibit the retention of shortfin mako sharks in the recreational fishery by placing it on the prohibited species list. Under the regulations, shark species can be added to the prohibited species list if two of the following four criteria are met: 1) There is sufficient biological information to indicate the stock warrants protection, such as indications of depletion or low reproductive potential or the species is on the ESA candidate list; 2) the species is rarely encountered or observed caught in HMS fisheries; 3) the species is not commonly encountered or observed caught as bycatch in fishing operations; or 4) the species is difficult to distinguish from other prohibited species (*i.e.*, look-alike issue). Adding shortfin mako sharks to the prohibited species list would make it illegal to land shortfin mako sharks recreationally or commercially and recreational fishermen would only be authorized to catch and release shortfin mako sharks.

### 2.3 Smooth Dogfish

NMFS currently manages sharks in four management units (small coastal sharks, pelagic sharks, large coastal sharks, and prohibited species). There are additional species of sharks that are HMS and that fall outside of the current management units. The management of these species remain under Secretarial authority should the Secretary determine the species is in need of conservation and management. One of these species, smooth dogfish, is not currently managed at the federal level. Although smooth dogfish were previously included in a fishery management unit (FMU) that included deepwater and other sharks in order to prevent finning, these species were removed from the FMU in the 2003 Amendment 1 to the Fishery Management Plan for Atlantic Tunas, Swordfish, and Sharks since they were protected from finning under the Shark Finning Prohibition Act (67 FR 6124, February 11, 2002). The Magnuson-Stevens Act is the primary statute giving fishery management authority to NMFS, on behalf of the Secretary of Commerce. The Magnuson-Stevens Act also provides authority for the Regional Fishery Management Councils to manage stocks and species within each Council's geographic jurisdiction due to the Council's close cooperation with constituents, fishery experience and knowledge, and consensus building process. One exception to this management authority is for Atlantic HMS, which are managed solely under NMFS, on behalf of the Secretary of Commerce. As detailed below, NMFS has determined that smooth dogfish falls within the congressional directive regarding HMS and should be managed under the Secretary's authority.

Before and during the public comment period for the DEIS and the proposed rule, NMFS received several suggestions that the management of smooth dogfish should be given to the Regional Fishery Management Councils. NMFS disagrees (see Appendix C). The Magnuson-Stevens Act Section 3 (21) defines HMS. Unlike other HMS, sharks are not defined by family or species. Rather, the term "oceanic shark" is used. The statute does not further expound upon or define this term. Furthermore, NS3 requires that, to the extent practicable, an individual stock of fish should be managed throughout its range and Section 302 (3) states that the Secretary shall have authority over any HMS fishery that is within the geographical area of authority of more than one of the five Atlantic Councils. As described in Chapter 11, based on distribution maps provided in Compango (1984), smooth dogfish are found along the eastern seaboard of the United States from Massachusetts to Florida, in the Gulf of Mexico, and in the Caribbean Sea. Their distribution further extends outside the U.S. EEZ to the northern South American coast. Based on scientific surveys and recreational and commercial landings, NMFS has verified that smooth dogfish are found in each of the five Atlantic Regional Fishery Management Council regions. While the primary fishery occurs in the mid-Atlantic region, the species is currently caught in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea, and fishing effort on smooth dogfish could expand in these other regions. Given the wide distribution and range of smooth dogfish and the sections of the Magnuson-Stevens Act noted above, NMFS has determined that smooth dogfish is an oceanic shark, and therefore, because it meets the definition of HMS, the species should be managed by NMFS on behalf of the Secretary.

NMFS determined that conservation and management of smooth dogfish under the Magnuson-Stevens Act is warranted in order to collect data regarding the fishery, fishing effort, and life history of the species. First, a number of stakeholders have indicated that management of smooth dogfish is necessary. These include environmental organizations that have specifically requested management action, the ASMFC that included smooth dogfish in its management unit when finalizing its Interstate FMP for Coastal Sharks, and the MAFMC that specifically requested management authority to manage the smooth dogfish fishery. These efforts by the ASMFC and the MAFMC reinforced the request from environmental organizations that the fishery is in need of conservation and management.

Second, based on existing data, it is apparent that the smooth dogfish fishery is substantial and thus requires sound science-based conservation and management to provide for the long-term sustainable yield of the stock. The smooth dogfish fishery has significant annual landings with a large directed component. Even though landings of the species are likely underreported, the average annual landings of 431 mt dw is among the highest for any species of shark managed by NMFS, eclipsed by only sandbar and blacktip shark landings prior to implementation of Amendment 2. As is common in other elasmobranchs, smooth dogfish are slow to reproduce (see Chapter 11) and, therefore, could be vulnerable to stock collapse in the face of unrestricted fishing. NMFS needs to collect reliable data concerning the status of the stock to guide development of conservation and management measures, if necessary and appropriate, to meet the requirements of the Magnuson-Stevens Act.

Third, the vast majority of the smooth dogfish catch occurs with gillnets. Some gillnet fisheries in the Atlantic are defined as a Category I fisheries under the Marine Mammal Protection Act (MMPA), meaning the annual mortality and serious injury of one or more marine mammal stocks in a given fishery is greater than or equal to 50 percent of the Potential Biological Removal (PBR) level. While all fisheries need to comply with the requirements of the MMPA regardless of management status, it is easier to ensure the affected fishermen are engaged in the process if their fishery is consistently managed in accordance with uniform conservation and management measures developed and implemented through an FMP in accordance with the procedures in the Magnuson-Stevens Act.

Lastly, the smooth dogfish market could overlap with that of spiny dogfish, which is a species that is federally managed with a significant directed fishery. Spiny dogfish required restrictive management measures in the late 1990s and early 2000s to deal with domestic overfishing. While domestically spiny dogfish stocks appear to be healthy, other stocks internationally are overfished. Because of the possible overlap in markets, NMFS is concerned that smooth dogfish products can be used as a substitute for spiny dogfish products. If there is market overlap, then declines in spiny dogfish stocks (as is seen internationally) and restrictive management measures (including domestic management) could push, or might have already pushed, effort into the smooth dogfish fishery. Until initial management measures are in place to collect data concerning location, effort, and the status of the stock, NMFS will not be able to determine whether further prescriptive

conservation and management through future FMP amendments and/or regulatory changes are necessary due to the influence of the foregoing and other relevant factors.

As noted in Chapter 1, Section 1.3.5, all smooth dogfish management measures would also apply to Florida smoothhounds (*Mustelus norrisi*).

The following alternatives consider a range of possible management measures for smooth dogfish:

Alternative F1            No Action. Do not add smooth dogfish under NMFS management

Smooth dogfish are not currently managed at the federal level, and under Alternative F1, the No Action alternative, NMFS would not add smooth dogfish under NMFS management and would not implement management measures for smooth dogfish. Furthermore, essential fish habitat (EFH) for smooth dogfish would not be identified and described under the No Action alternative. While no federal action would be taken by NMFS, this alternative would not preclude state or interstate marine fisheries commission management measures.

*Alternative F2            Add smooth dogfish under NMFS management and establish a federal permit requirement-Preferred Alternative*

Alternative F2, the preferred alternative, would implement federal management of smooth dogfish and establish a permit requirement for commercial and recreational retention of smooth dogfish in federal waters. Management measures, including the federal permit and fins attached requirements, would not be implemented until the beginning of the smooth dogfish fishing season in 2012. This delay would allow NMFS to consider and evaluate implications of the final smooth dogfish BiOp, have additional discussions with fishery participants regarding the fins attached requirement and implement the permit requirements.

Under this alternative, the federal permit requirement would allow NMFS to collect data regarding participants in the fishery. Placing smooth dogfish under NMFS management would require that fishermen fishing for smooth dogfish comply with current Atlantic HMS regulations in the Atlantic Ocean, Gulf of Mexico, and Caribbean Sea, including the requirement that sharks be offloaded with their fins naturally attached. This alternative would also provide NMFS the ability to select vessels to carry an observer. This alternative would not require fishermen to attend the protected species release, disentanglement, and identification workshops. As NMFS gathers information about the fishery and the fishermen, NMFS may decide to require fishermen attend these workshops as is required in other HMS longline and gillnet fisheries. Over time, NMFS would likely implement logbook or other reporting for smooth dogfish fishermen. NMFS would not do this, however, until the universe of fishermen is known and until NMFS can determine the appropriate mechanism of reporting while minimizing duplication with current reporting requirements. Dealers would be required to report smooth dogfish on HMS dealer reports or through the Standard Atlantic Fisheries Information System (SAFIS). Recreational fishermen would need to obtain either an HMS Angling or Charter/Headboat permit.

Gillnets are the primary gear type used in the smooth dogfish fishery and fishermen using gillnets to target smooth dogfish would be required to comply with federal marine mammal take regulations at 50 CFR 229.32 mandated by the Marine Mammal Protection Act. These regulations and the associated Take Reduction Plans are specific to the region where gillnets are fished. The Take Reduction Plans include the Atlantic Large Whale Take Reduction Plan, the Bottlenose Dolphin Take Reduction Plan, and the Mid-Atlantic Harbor Porpoise Take Reduction Plan.

Trawl gear is occasionally used to catch smooth dogfish incidentally, which are sometimes retained. In line with NMFS' intention to minimize changes to the fishery, fishermen would be allowed to harvest smooth dogfish with trawl gear at incidental levels only. Fishermen would be allowed to harvest smooth dogfish with trawl gear provided sufficient quantities of the target catch are retained to allow for incidental landings of smooth dogfish, similar to the current allowance of swordfish on squid trawl vessels.

As a statutory condition of establishing federal management of smooth dogfish, EFH for the species must be identified and described. Amendment 1 to the 2006 Consolidated HMS FMP extensively analyzed methods for determining EFH, and NMFS considers the conclusions in Amendment 1 to the 2006 Consolidated HMS FMP to be the best available science. As such, no alternatives were considered for designating EFH other than the No Action alternative and the method used in Amendment 1 to the 2006 Consolidated HMS FMP. Chapter 11 of this document summarizes this methodology used to identify and describe smooth dogfish EFH and includes a map of the smooth dogfish EFH boundaries.

On January 16, 2009, NMFS published the final rule for implementing the ACL and AM requirements of the Magnuson-Stevens Act (74 FR 3178). Per the January 2009 final rule, ACLs and AMs apply "unless otherwise provided for under an international agreement in which the United States participates." Given smooth dogfish are not managed under any international agreements, NMFS must follow NSG1 for smooth dogfish. The landings component of the sector-ACL, or commercial quota, would be based on historic landings data spanning 1998-2007 (the last 10 years with complete landings data). Table 2.4 shows the total annual landings by year as well as summary data spanning 1998-2007. The following four alternatives consider a range of quotas based on 1998-2007 summary data. The quota listed in each alternative has been converted from lbs dw to mt dw using the conversion of 1 mt = 2204.6 lbs. The landings data does not show any obvious trends and are likely an underestimate due to underreporting. Due to the lack of a stock assessment, there is no information regarding the stock status of smooth dogfish. Since reliable catch and stock status data is not available, NMFS would establish a quota that would not change current landings. NMFS would account for underharvest and overharvest of smooth dogfish as it does for other shark species and would close the smooth dogfish shark quota with five days notice upon filing in the Federal Register when the smooth dogfish shark quota reaches or is projected to reach 80 percent. This would help prevent overharvest from occurring while still giving the public five days notice that the fishery would close. The four following alternatives consider a range of quota options based on the current level of harvest.

**Table 2.4 Total Annual Landings by Year and Summary Data spanning 1998-2007.**  
Source: ACCSP

Year	Total Annual Landings (lb dw)	Landings Summary	lb dw	mt dw
1998	785,700	Average Annual Landings	950,859	431.3
1999	954,606	Maximum Landings	1,270,137	576.1
2000	776,449	One Standard Deviation	153,591	69.7
2001	880,425	Maximum Landings + One Standard Deviation	1,423,728	645.8
2002	1,037,440	Maximum Landings + Two Standard Deviations	1,577,319	715.5
2003	1,068,279			
2004	1,270,137			
2005	888,017			
2006	821,300			
2007	1,026,243			

Alternative F2a1) Establish a smooth dogfish quota that is equal to the average annual landings from 1998-2007 (431.3 mt dw)

This alternative would set the annual quota equal to the historical average reported annual landings of 431.3 mt dw (950,859 lb dw). Total reported annual catches between 1997 and 2007 had low variability, with a minimum of 776,448 lb dw in 2000 and a maximum of 1,270,137 lb dw in 2004. Assuming that the reported landings are accurate and that all landings are reported, this alternative could allow the fishery to operate at or near its current level of utilization.

Alternative F2a2) Establish a smooth dogfish quota equal to the maximum annual landings from 1998-2007 (576.1 mt dw)

This alternative would set the annual quota at the maximum historical reported annual landing of 576.1 mt dw (1,270,137 lb dw). Assuming that the reported landings are accurate, this alternative would allow the fishery to operate at its current level, and accommodate for the fluctuation of landings. Any levels of utilization at or near the peak landing in 2004 would be permissible under this quota alternative.

Alternative F2a3) Establish a smooth dogfish quota equal to the maximum annual landings from 1998-2007 plus one standard deviation (645.8 mt dw)

Alternative F2a3, previously the preferred alternative in the DEIS, would set the smooth dogfish quota equal to the maximum annual landings between 1998-2007 plus one standard deviation during the same time period (1,270,137 lb dw + 153,591 lb dw), for a total of 645.8 mt dw (1,423,728 lb dw). Similar to alternative F2a2, this alternative attempts to allow the fishery to continue to operate up to the maximum level of utilization

between 1998-2007. However, based on public comment, as detailed below, NMFS does not believe that this alternative would adequately account for underreporting.

*Alternative F2a4) Establish a smooth dogfish quota equal to the maximum annual landings from 1998-2007 plus two standard deviations (715.5 mt dw) – Preferred Alternative*

Alternative F2a4, the preferred alternative, was added by NMFS after the public comment period following publication of the DEIS. Based upon public comment, and input from the SEFSC, NMFS believes that this new preferred alternative better reflects the intent of the previous preferred alternative, and remains within the range of considered alternatives. As stated in the purpose and need, the smooth dogfish management measures are designed to collect data while minimizing changes to the fishery. To achieve this goal, it is important to ensure that the smooth dogfish quota is set at a level that allows current fishing practices to continue. Multiple commenters stated that the proposed smooth dogfish quota was too low, and the SEFSC offered that two standard deviations, rather than one, above the maximum annual landings would better account for underreporting. Two standard deviations above maximum landings is equal to a quota of 715.5 mt dw (1,577,319 lbs dw). Since the fishery has not been previously managed, there have been no reporting requirements in the past. While the data from ACCSP used in this analysis likely included the vast majority of landings, the possibility exists of remaining unreported landings. Alternative F2a4 is preferred at this time because it would allow the fishery to continue to operate even if sources of dogfish mortality that were previously unknown start to be reported.

In addition to the commercial quota established under alternative F2, NMFS must also consider a set-aside quota for activities that collect dogfish for research or for public display. The current set-aside for all shark species under NMFS' jurisdiction is 60 mt ww. The two alternatives below consider a range of options for establishing a smooth dogfish set-aside quota for research and public display:

*Alternative F2b1) Establish a separate smooth dogfish set-aside quota for the exempted fishing program – Preferred Alternative*

Alternative F2b1 would establish a separate smooth dogfish set-aside quota for the exempted fishing program. Currently, there is a 60 mt ww set-aside quota for sharks for the exempted fishing program. However, as smooth dogfish have not been federally managed in the past, smooth dogfish were not included in this 60 mt ww set-aside. Thus, to allow fishermen to take smooth dogfish for research purposes and outside of any established regulations for smooth dogfish, NMFS would establish a separate set-aside for smooth dogfish based on the maximum yearly smooth dogfish takes during research over the past 10 years or six mt ww.

Alternative F2b2) Establish a smooth dogfish set-aside quota for the exempted fishing program and add it to the current 60 mt ww set-aside quota for the exempted fishing program

Under alternative F2b2, NMFS would establish a smooth dogfish set-aside quota for the exempted fishing program and add it to the current 60 mt ww set-aside quota for the exempted fishing program. As explained under alternative F2b1, smooth dogfish are not included in the current 60 mt ww set-aside quota for sharks for the exempted fishing program. Thus, the inclusion of smooth dogfish under the exempted fishing program shark quota set-aside would allow fishermen to take smooth dogfish for research purposes and outside of any established regulations for smooth dogfish. NMFS would establish a set-aside for smooth dogfish based on the maximum yearly smooth dogfish takes during research over the past 10 years or six mt ww, and add it to the existing 60 mt ww research set-aside for a total quota for the exempted fishing program of 66 mt ww.

Alternative F3 Add smooth dogfish under NMFS management and mirror management measures implemented in the Atlantic States Marine Fisheries Commission (ASMFC) Interstate Shark FMP

This alternative would implement federal management of smooth dogfish and use the same methods and management tools implemented by the ASMFC Interstate Shark FMP. NMFS is cognizant of differences in mandates and missions between NMFS and ASMFC and would ensure that any federal measures would comply with federal standards.

In September 2009, the ASMFC approved a smooth dogfish Addendum to the Atlantic Coastal Sharks FMP. Included within this Addendum is an exception for smooth dogfish to allow at-sea processing (*i.e.*, removal of shark fins while still onboard a fishing vessel), removal of recreational retention limits for smooth dogfish, and removal of the two hour net-check requirement for shark gillnets. The at-sea processing exception allows smooth dogfish fishermen to remove the tail and all the fins of a smooth dogfish from March to June. The remainder of the year, July through February, fishermen can remove the tail and all the fins except for the first dorsal fin. In both cases, removed fin weight cannot exceed five percent of the carcass weight. The allowance for the removal of shark fins while still onboard a fishing vessel and removal of the two hour net-check requirement differs from current federal regulations.

## **2.4 Alternatives Considered But Not Further Analyzed**

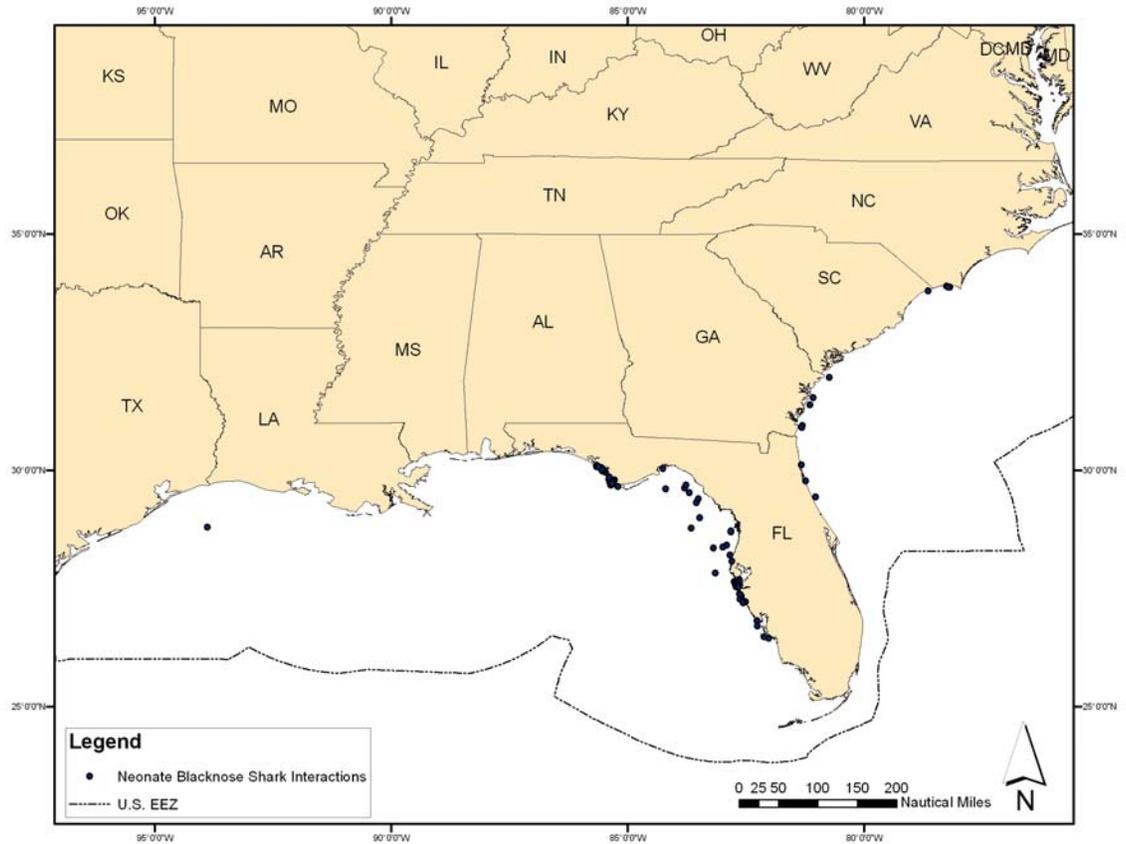
Alternative G1 Establish species-specific quotas for all species in the SCS complex based on average landings; close each quota individually, as needed

While NMFS has been working towards species-specific management for many sharks, species-specific quotas for sharks in the small coastal shark complex could be challenging due to the small size of the individual quotas. Establishing species-specific SCS quotas would result in four small quotas, which could be difficult to monitor and effectively manage. These quotas would be based on average landings resulting in the following quotas: bonnethead = 21 mt; finetooth = 81.6 mt; Atlantic sharpnose = 124.4 mt;

blacknose = 13.5 mt (78 percent reduction of average landings). Individual quotas based on average landings would result in a much lower overall SCS quota, which could have large, negative socioeconomic impacts on shark fishermen. In addition, small quotas would require accurate and timely reporting of landings data to ensure that overharvests do not occur. Given the current reporting frequency of bi-monthly reports from HMS dealers, and the ability to implement larger SCS quotas through other alternatives, NMFS does not believe implementing small species-specific quotas is feasible at this time. Additionally, implementing species-specific quotas could limit flexibility of the fishermen. For instance, there may be some years where there are more Atlantic sharpnose and fewer finetooth sharks than usual. Under the current complex, fishermen would be able to land the greater number of Atlantic sharpnose sharks. Under this alternative, fishermen would be limited in the amount of Atlantic sharpnose sharks because of the species specific quota. This decrease in flexibility could be particularly limiting given the preferred alternative A6, where gillnet fishermen are given the opportunity to show they can target certain species and avoid other species. Therefore, alternative G1 was considered but not further analyzed at this time.

Alternative G2            Establish new time/area closures in blacknose shark nursery areas for all HMS gears

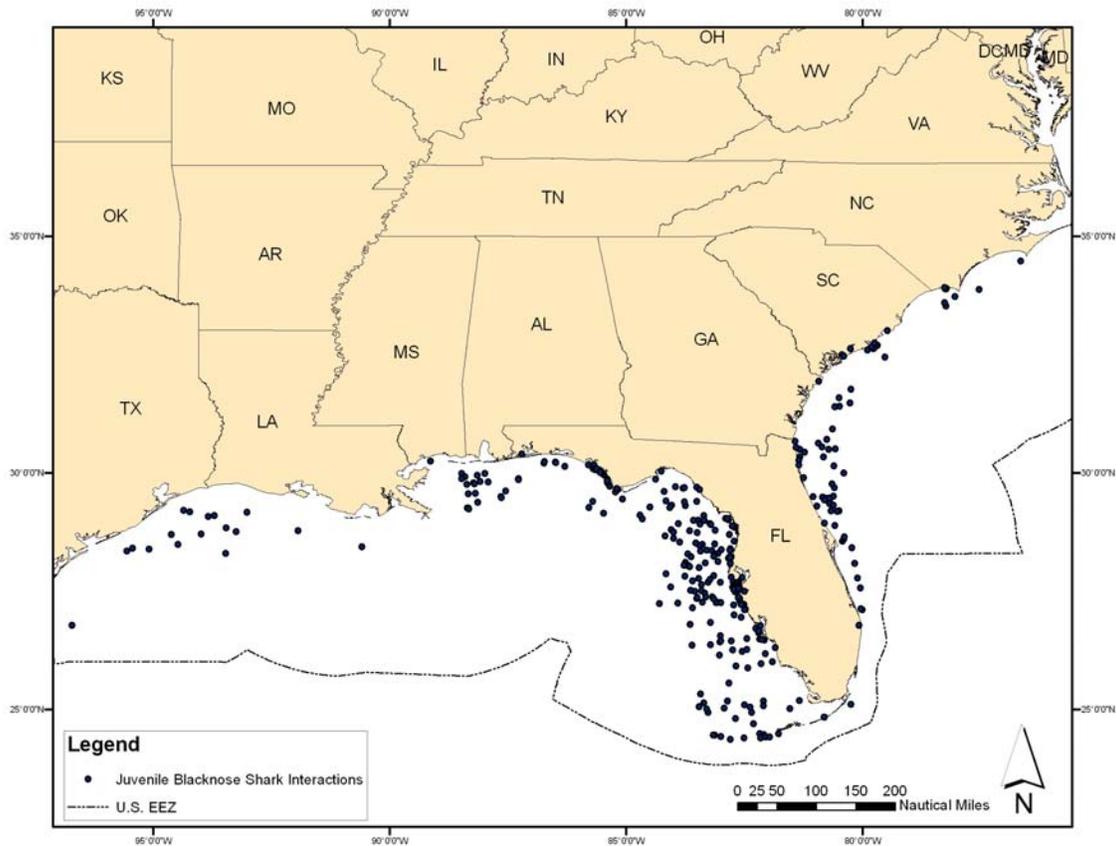
Time/area closures in blacknose shark nursery areas could potentially enhance recruitment of individuals to the stock by protecting neonates and juveniles from high fishing pressure. Identification of discrete nursery areas is essential to avoid non-specific, large closures. Identification of such areas requires catch and/or high catch-per-unit-effort data of neonate and/or juvenile animals within a distinct geographic area. However, available catch data of neonate and juvenile blacknose sharks do not identify distinct geographic areas that can be identified as nursery areas for blacknose sharks (Figure 2.1 and Figure 2.2). Thus, establishing time/area closures in areas where blacknose interactions have occurred would result in large time/area closures in order to be effective. Large closures would likely result in excessive negative socioeconomic impacts on shark fishermen as well as fishermen for other species that catch blacknose sharks as bycatch. Given these potentially large negative impacts and the ability to rebuild blacknose sharks through other alternatives, alternative G2 was considered but not further analyzed at this time.



**Figure 2.1**

**Neonate blacknose shark interactions.**

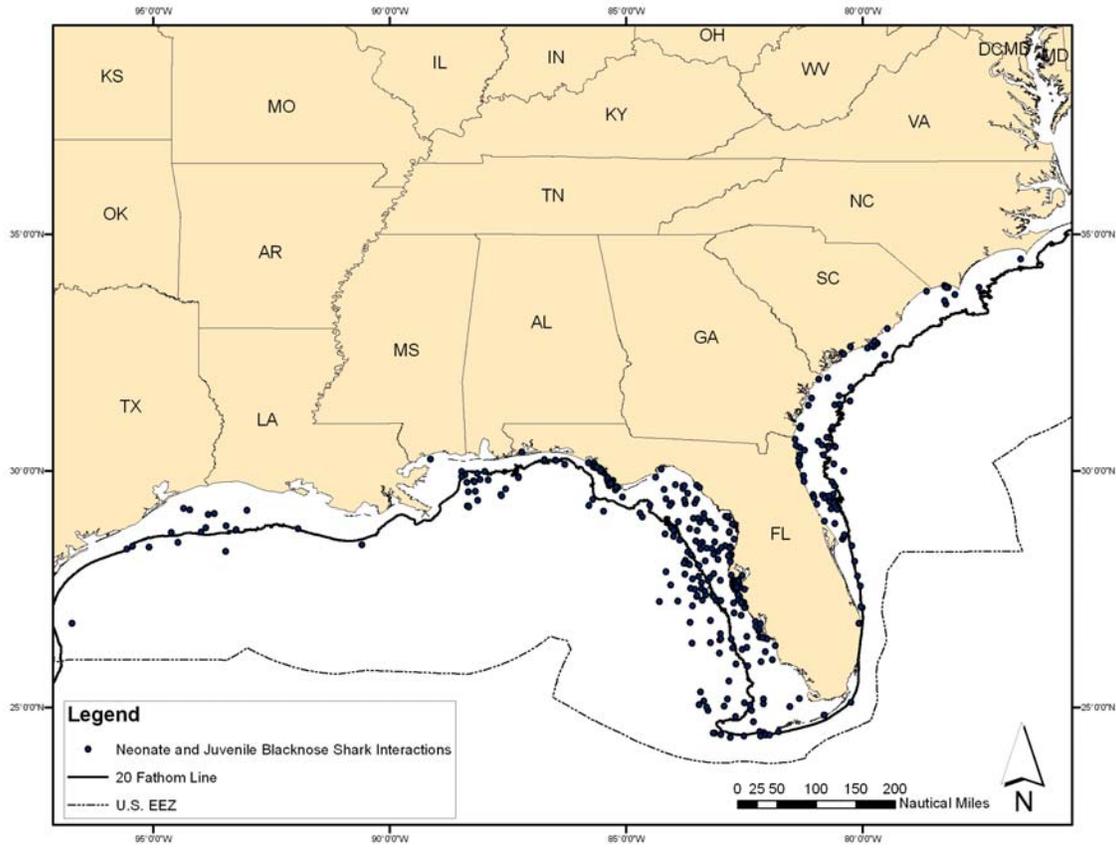
Data sources are from Carlson, 2002; Cooperative Atlantic States Shark Pupping and Nursery Area Program (COASTSPAN); Cooperative Shark Tagging Program (CSTP); Mote Marine Laboratory (MOTE); SEAMAP; Southeast Gillnet Survey (SEGN); Southeast Longline Survey (SELL); and the Shark Observer Program (SOP).



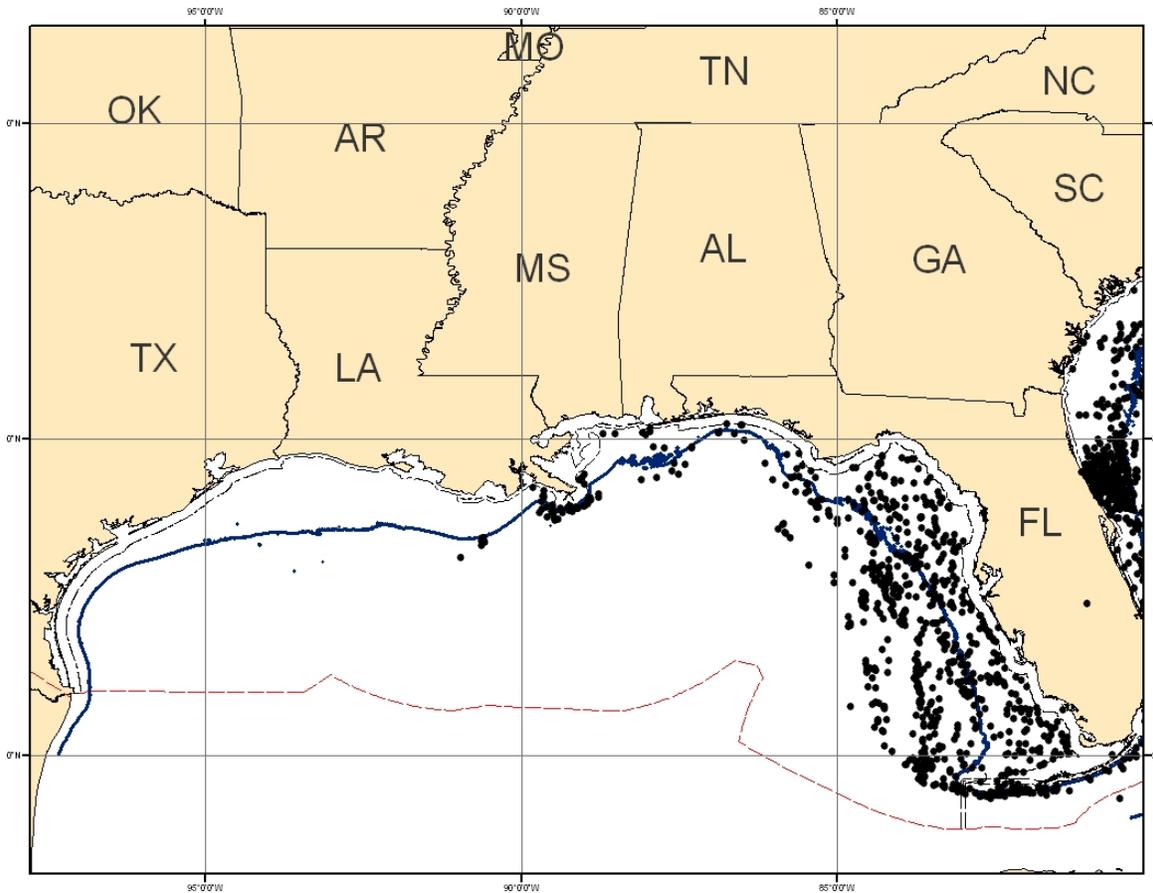
**Figure 2.2 Juvenile blacknose shark interactions.**  
 Data sources are from Carlson, 2002; Cooperative Atlantic States Shark Pupping and Nursery Area Program (COASTSPAN); Cooperative Shark Tagging Program (CSTP); Mote Marine Laboratory (MOTE); SEAMAP; Southeast Gillnet Survey (SEGN); Southeast Longline Survey (SELL); the Shark Observer Program (SOP); Jones and Grace, 2002; and Parsons, 2002.

Alternative G3 Close waters inshore of 20 fathoms in the Gulf of Mexico to shark bottom longline gear

NMFS considered closing waters inshore of 20 fathoms in the Gulf of Mexico to shark BLL gear as a way to reduce fishing pressure on neonate and juvenile blacknose sharks. The majority of the recorded interactions with neonate and juvenile blacknose sharks have been recorded in waters inshore of 20 fathoms (Figure 2.3). Therefore, by closing waters inshore of 20 fathoms, NMFS would relieve fishing pressure on neonate and juvenile blacknose sharks. However, closing waters inshore of 20 fathoms could have a large, negative socioeconomic impact on the shark BLL fishery in the Gulf of Mexico, as the majority of the sharks sets from the observer program from 1994-2007 occurred inshore of 20 fathoms (Figure 2.4). Given these potentially large, negative impacts and the ability to rebuild blacknose sharks through other alternatives, alternative G3 was considered but not further analyzed at this time.



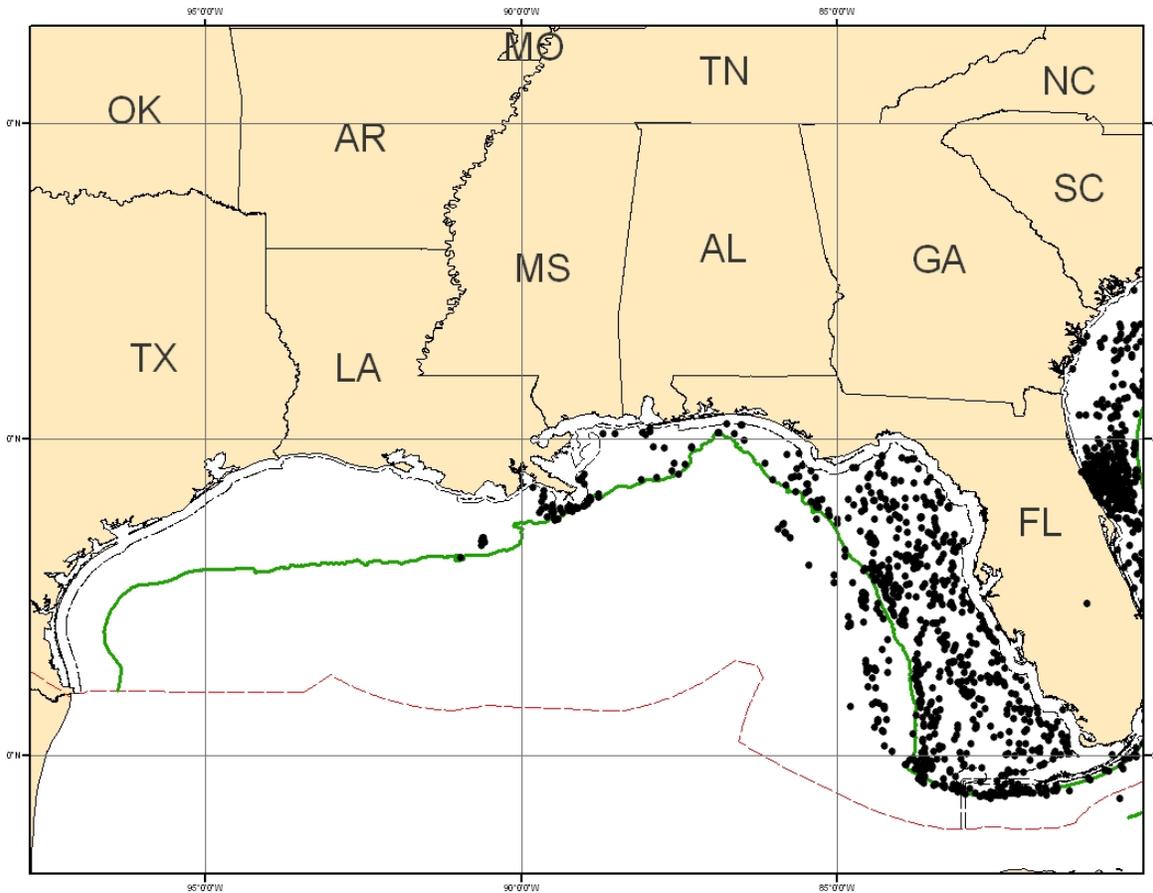
**Figure 2.3** Neonate and juvenile blacknose interactions relative to the 20 fathom line. Data sources the same as Figures 2.1 and 2.2.



**Figure 2.4** Observed BLL sets from 1994-2007 relative to the 20 fathom line. The solid line indicates the 20 fathom line, and the dashed line is the EEZ. The double dashed line off the tip of Florida is the Gulf of Mexico/South Atlantic Fishery Management Council boundary delineation. Source: Shark Observer BLL Program.

Alternative G4 Close waters inshore of 50 fathoms in the Gulf of Mexico to shark bottom longline gear

NMFS considered closing waters inshore of 50 fathoms in the Gulf of Mexico to shark BLL gear as a way to reduce fishing pressure on neonate and juvenile blacknose sharks and to complement the Gulf of Mexico Fishery Management Council’s emergency rule in the Gulf of Mexico region for reef fish BLL gear (74 FR 20229; May 1, 2009). The emergency rule prohibits the use of BLL gear for reef fish in waters less than 50 fathoms for the entire eastern Gulf of Mexico in order to reduce sea turtle interactions. However, closing waters inshore of 50 fathoms would have a large, negative socioeconomic impact on the shark BLL fishery in the Gulf of Mexico, as the majority of the sharks sets from the observer program from 1994-2007 occur inshore of 20 fathoms (Figure 2.5). Given these potentially large, negative impacts and the ability to rebuild blacknose sharks through other alternatives, alternative G3 was considered by not further analyzed at this time.



**Figure 2.5** Observed BLL sets from 1994-2007 relative to the 50 fathom line. The solid line indicates the 50 fathom line, and the dashed line is the EEZ. The double dashed line off the tip of Florida is the Gulf of Mexico/South Atlantic Fishery Management Council boundary delineation. Source: Shark Observer BLL Program.

Alternative G5 Add deepwater sharks to the management unit and place these species on the prohibited list

This alternative would implement federal management of deepwater sharks by placing them on the prohibited list. This action, however, is not likely to have significant ecological benefits since deepwater sharks are not currently targeted in any fishery and are only caught as bycatch. Placing this group on the prohibited list would not prevent bycatch.

Additionally, prohibiting the landing of deepwater sharks would limit data gained from incidental catches. If prohibited, these rarely encountered species would have to be released and could not be landed and submitted for subsequent analysis. Therefore, alternative G5 was considered but not further analyzed at this time.

Alternative G6 Establish catch shares in the Atlantic shark fisheries

A catch share is the allocation of the available fishery quota among participants within the fishery. LAPPs are one type of catch share program. These programs may be

implemented to address numerous issues, including but not limited to: ending the race for fish, reducing overcapitalization, and improving efficiency and safety, while still addressing the biological needs of a stock. These programs can be designed to meet the specific needs of a fishery, provided they meet the requirements outlined in the Magnuson-Stevens Act. Catch shares were not considered for the shark fishery in this amendment because of the ramifications this type of program would have for the existing permit structure and the time required for implementing these programs.

To properly design a catch share program that appropriately considers the views and interests of all stakeholders and then implements such a system would take NMFS several years, and therefore, catch shares were not considered a reasonable alternative for this action given the mandate in § 304(e) of the Magnuson-Stevens Act to have ACLs in place for stocks experiencing overfishing by 2010. However, NMFS is considering revisions to the existing permit structure within HMS fisheries. This could include a catch share program for sharks as well as other HMS as was discussed during the September/October 2008 HMS Advisory Panel. NMFS published an ANPR on June 1, 2009 (74 FR 26174), to initiate broad public participation in considering catch shares for HMS fisheries. On December 10, 2009, NOAA released for public comment a draft policy on the use of catch share programs in fishery management plans ([http://www.nmfs.noaa.gov/sfa/domes\\_fish/catchshare/index.htm](http://www.nmfs.noaa.gov/sfa/domes_fish/catchshare/index.htm)). The draft NOAA policy encourages well-designed catch share programs to help rebuild fisheries and sustain fishermen, communities and vibrant working waterfronts. The draft policy provides a foundation for facilitating the wide-spread voluntary consideration of catch shares, while empowering local fishermen to be part of the process. Any catch share program designed for Atlantic sharks or other HMS would consider the final catch share policy and any comments received in finalizing that policy.