

CHAPTER 6 TABLE OF CONTENTS

Chapter 6 Table of Contents	6-i
Chapter 6 List of Tables	6-ii
6.0 Economic Evaluation	6-1
6.1 Number of Vessel and Dealer Permit Holders.....	6-1
6.2 Gross Revenue of the Commercial Shark Fishermen.....	6-2
6.3 Variable Costs and Net Revenues of Commercial Shark Fishermen	6-4
6.4 Expected Economic Impacts of the Alternatives.....	6-5
6.4.1 Commercial Measures	6-5
6.4.2 Recreational Measures	6-26
6.4.3 Smooth Dogfish	6-28
Chapter 6 References	6-31

CHAPTER 6 LIST OF TABLES

Table 6.1 Number of Shark Limited Access Permits holder between 2004 and 2009. 6-1

Table 6.2 Number of CHB Permits by Year in 2009-2006. 6-1

Table 6.3 Number of shark dealer permits issued from 2004-2009. The actual number of permits per region may change as permit holders move or sell their businesses. 6-2

Table 6.4 Estimates of the total ex-vessel annual revenues of Atlantic Shark HMS fisheries. 6-3

Table 6.5 Ex-vessel prices per pound dress weight for shark complexes from 2004-2007..... 6-4

Table 6.6 Ex-vessel prices per pound dress weight for proposed new shark species quotas from 2004-2007. 6-4

Table 6.7 Median real ex-vessel prices for shark species groups from 2004-2007. Prices adjusted to December 2007 dollars using CPI-U..... 6-4

Table 6.8 Average ex-vessel prices and average annual gross revenues from 2004-2007 under the No Action alternative, A1. Shark fins are assumed to be 5 percent of the carcass weight. 6-6

Table 6.9 Average ex-vessel prices and average annual gross revenues from 2004-2007 under alternative A2. Shark fins are assumed to be 5 percent of the carcass weight..... 6-8

Table 6.10 Average ex-vessel prices and average annual gross revenues from 2004-2007 under alternative A3. Shark fins are assumed to be 5 percent of the carcass weight..... 6-10

Table 6.11 Average ex-vessel prices and average annual gross revenues for entire fishery from 2004-2007 under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight. 6-12

Table 6.12 Lost average annual gross revenues (from 2004-2007) for vessels that fish for non-blacknose SCS and blacknose sharks with gillnet gear under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight. 6-14

Table 6.13 Lost average annual gross revenues (from 2004-2007) for vessels that fish for LCS with gillnet gear under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight. 6-17

Table 6.14 Average annual gross revenues (from 2004-2007) of vessels that land LCS but do not use gillnet gear under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight. 6-17

Table 6.15 Lost average annual gross revenues (from 2004-2007) for vessels landings non-blacknose SCS, blacknose sharks, and LCS under alternative A5. Shark fins are assumed to be 5 percent of the carcass weight. 6-19

Table 6.16 Estimates of shortfin mako shark landings (lb dw) reductions according to size restrictions proposed in alternatives C4a and C4b..... 6-25

Table 6.17 Total number of shortfin mako sharks reported to the LPS from 2004 to 2008. 6-27

6.0 ECONOMIC EVALUATION

This section assesses the economic impacts of the alternatives presented in this document. The primary purpose of this chapter is to provide the baseline economic data for the Regulatory Impact Review (RIR) in Chapter 7 and the Initial regulatory Flexibility Analysis (IRFA) in Chapter 8. It also provides relevant data for Community Profiles described in Chapter 9. While this chapter provides an economic analysis, more specific data necessary to completely analyze socio-economic impacts related to the proposed action and amendments is disclosed in Chapters 3, 4 and 9.

6.1 Number of Vessel and Dealer Permit Holders

In order to examine the baseline universe of entities potentially affected by the preferred alternatives, NMFS analyzed the number of permits that were issued as of March 2009 in conjunction with HMS fishing activities.

As of March 18, 2009, there were a total of 502 commercial permit holders in the Atlantic shark fishery (223 directed and 279 incidental permits). Table 6.1 provides a summary of these permit holders since 2004. Further detail regarding commercial permit holders is provided in Chapter 3.

Table 6.1 Number of Shark Limited Access Permits holder between 2004 and 2009.

Year	# Directed Shark	# Incidental Shark
2009	223	279
2008	214	285
2007	231	296
2006	240	312
2005	235	320
2004	241	348

In addition to the universe of commercial shark permit holders, some of the alternatives considered also impact Atlantic HMS CHB permit holders. The historic numbers of CHB permit holders are listed in Table 6.2. The total number of CHB increased between 2006 and 2009.

Table 6.2 Number of CHB Permits by Year in 2009-2006.

Year	CHB Permits
2009	4,837
2008	4,297
2007	3,899

Year	CHB Permits
2006	4,173

As of March 18, 2009, there were a total of 100 Atlantic shark dealer permit holders. Table 6.3 provides a summary of shark dealer permit holders by year. Further detail regarding shark dealer permit holders is provided in the 2006 Consolidated HMS FMP. All dealer permit holders are required to submit reports detailing the nature of their business. For shark permit holders, dealers must submit bi-weekly dealer reports on all HMS they purchase. To facilitate quota monitoring “negative reports” for shark are also required from dealers when no purchases are made (*i.e.*, NMFS can determine who has not purchased fish versus who has neglected to report).

Table 6.3 Number of shark dealer permits issued from 2004-2009. The actual number of permits per region may change as permit holders move or sell their businesses.

Year	Atlantic shark dealers
2009	100
2008	128
2007	206
2006	336
2005	228
2004	230

6.2 Gross Revenue of the Commercial Shark Fishermen

NMFS calculated annual gross revenues by combining current Federal permit holders with their reported landings from logbooks and shark dealer reports averaged from 2000 to 2007. These landings were multiplied by ex-vessel prices for LCS meat, pelagic shark meat, SCS meat, and shark fins obtained from dealer reporting to determine annual gross revenues.

Of all Atlantic HMS, sharks bring in the lowest total gross revenues (~\$4.3 million in 2007) according to the 2008 SAFE Report. Table 6.4 provides data on the prices shark fishermen received at the dock. The average values for ex-vessel prices from the Southeast Fisheries Science Center’s Accumulative Landings System (ALS) and dealer reports from the Northeast were used to construct the table.

Table 6.4 Estimates of the total ex-vessel annual revenues of Atlantic Shark HMS fisheries.

Sources: NMFS 2008; Cortés, 2003; Cortés and Neer, 2002, 2005; Cortés, pers.comm.

Species		2000	2001	2002	2003	2004	2005	2006	2007
Large coastal sharks	Ex-vessel \$/lb dw	\$0.68	\$0.91	\$0.99	\$0.78	\$0.86	\$0.86	\$0.89	\$0.58
	Weight lb dw	3,713,125	3,414,967	4,151,594	4,292,403	3,213,896	3,306,583	3,852,124	2,308,018
	Fishery Revenue	\$2,524,925	\$3,107,620	\$4,110,078	\$3,348,074	\$2,763,951	\$2,843,661	\$3,428,390	\$1,338,650
Pelagic sharks	Ex-vessel \$/lb dw	\$1.09	\$1.11	\$0.99	\$1.04	\$1.12	\$1.16	\$1.14	\$1.10
	Weight lb dw	350,705	345,895	467,682	637,324	679,469	235,600	185,266	263,765
	Fishery Revenue	\$382,268	\$383,943	\$463,005	\$662,817	\$761,005	\$273,296	\$211,203	\$290,142
Small coastal sharks	Ex-vessel \$/lb dw	\$0.46	\$0.79	\$0.52	\$0.43	\$0.50	\$0.52	\$0.51	\$0.63
	Weight lb dw	593,027	724,332	615,915	534,523	451,651	650,202	823,353	654,099
	Fishery Revenue	\$272,792	\$572,222	\$320,276	\$229,845	\$225,826	\$338,105	\$419,910	\$412,082
Shark fins (weight = 5% of all sharks landed)	Ex-vessel \$/lb dw	\$10.47	\$19.67	\$19.87	\$17.09	\$16.25	\$18.18	\$18.53	\$13.84
	Weight lb dw	232,843	224,260	261,760	273,213	217,251	209,619	243,037	161,294
	Fishery Revenue	\$2,437,865	\$4,411,188	\$5,201,162	\$4,669,202	\$3,530,326	\$3,810,878	\$4,503,478	\$2,232,310
Total sharks	Fishery Revenue	\$5,617,851	\$8,474,974	\$10,094,521	\$8,909,938	\$7,281,107	\$7,265,940	\$8,562,982	\$4,273,185

Note: Average ex-vessel prices may have some weighting errors.

Table 6.5 reports ex-vessel prices by shark complex and year. The ex-vessel price data indicates somewhat stable ex-vessel prices since 2004.

Table 6.5 Ex-vessel prices per pound dress weight for shark complexes from 2004-2007.
Source: HMS Dealer Reports

Species Complex	2004	2005	2006	2007
Small coastal sharks	\$0.59	\$0.60	\$0.55	\$0.75
Large coastal sharks	\$0.40	\$0.50	\$0.40	\$0.40
Pelagic sharks	\$1.01	\$1.27	\$1.35	\$1.20
Shark fins	\$10.00	\$12.00	\$12.85	\$6.00

Table 6.6 Ex-vessel prices per pound dress weight for proposed new shark species quotas from 2004-2007.

Species	2004	2005	2006	2007
Blacknose shark	\$0.70	\$0.60	\$0.50	\$0.75
Other SCS	\$0.53	\$0.60	\$0.60	\$0.75
Shortfin mako	\$1.50	\$1.50	\$1.54	\$1.50
Other pelagic shark	\$0.52	\$0.50	\$0.55	\$0.70
Sandbar shark	\$0.40	\$0.50	\$0.45	\$0.45
Other LCS	\$0.35	\$0.48	\$0.40	\$0.40
Smooth dogfish	\$0.25	\$0.33	\$0.29	\$0.27
Smooth dogfish fins	\$1.82	\$2.25	\$1.74	\$2.00

Table 6.7 Median real ex-vessel prices for shark species groups from 2004-2007. Prices adjusted to December 2007 dollars using CPI-U.

Species Group	Median Real Price
Blacknose shark	\$0.66
Other small coastal sharks	\$0.67
Small coastal sharks	\$0.66
Shortfin mako	\$1.59
Other pelagic sharks	\$0.61
Pelagic sharks	\$1.27
Sandbar shark	\$0.61
Other large coastal sharks	\$0.44
Large coastal sharks	\$0.45
Shark fins	\$12.00
Smooth dogfish	\$0.29
Smooth dogfish fins	\$2.02

6.3 Variable Costs and Net Revenues of Commercial Shark Fishermen

In 2003, NMFS initiated mandatory cost-earnings reporting for selected vessels to improve the economic data available for all HMS fisheries. In the past, most of the studies regarding PLL variable costs and net revenues available to NMFS analyzed data from 1996 and 1997. The 2006 Consolidated HMS FMP provides a summary of several past studies on the variable costs and net revenues of longline fleets.

An analysis of the 2004 HMS logbook cost-earnings data provides updated information regarding the costs and revenue of a cross section of vessels operating in the

HMS fisheries. The data contains a total of 579 trips taken by 51 different vessels. As described in Larkin *et al.* (2000), median values are reported. Median gross revenues per trip for 2004 were approximately \$12,112. Median total costs per trip were \$4,345 (compared to \$3,320 in the Larkin *et al.* (2000) study), with fuel costs making up \$567 (13 percent) of those costs. Median net revenue in this sample was \$6,728 per trip (compared to \$8,624 in the Larkin *et al.* (2000) study). The typical trip was nine days long and involved six sets. The median number of crew was three, and the average share paid to crew was 11 percent of net revenue (\$740 per trip). The captain share of net revenue was 20 percent (\$1,346) and the owner share was reported to be 50 percent (\$3,364). The 2004 cost earnings information is similar to the findings of the 1996 study, but gross revenues appear to be lower than the Porter *et al.* (2001) study of 1997 operations.

6.4 Expected Economic Impacts of the Alternatives

In this rulemaking, NMFS considered six different categories of issues to address shark management measures where each issue had its own range of alternatives that would meet the objectives of the Magnuson-Stevens Act and the 2006 Consolidated HMS FMP. The expected economic impacts of the different alternatives considered and analyzed are discussed below.

6.4.1 Commercial Measures

6.4.1.1 SCS Commercial Quotas

As of March 18, 2009, there were 223 directed shark permit holders, 279 incidental permit holders, and 100 shark dealers. On average between 2004 and 2007, approximately 85 vessels with directed shark permits had SCS landings, of which 44 vessels had blacknose shark landings. Sixty-eight of the 85 vessels with directed shark permits also had finetooth, Atlantic sharpnose, and bonnethead shark landings. On average between 2004 and 2007, approximately 31 vessels with incidental shark permits had SCS landings, of which approximately 7 vessels had blacknose landings. Twenty-nine of the 31 vessels with incidental shark permits also had finetooth, Atlantic sharpnose, and bonnethead shark landings. The average annual gross revenues from 2004 through 2007 from all SCS meat were \$438,092 (Table 6.8). Average annual gross revenues for SCS fins were \$395,542, making total average annual gross revenues for SCS landings for the entire fishery \$833,634 (Table 6.8). Directed permit holders landed approximately 97 percent of the SCS landings whereas incidental permit holders landed approximately 3 percent of the SCS total landings. Thus, directed permit holders earned approximately \$807,792 in average annual gross revenues from SCS landings whereas incidental permit holders earned approximately \$25,843 from SCS landings (Table 6.8).

As for non-blacknose SCS, or finetooth, Atlantic sharpnose, and bonnethead sharks, the average annual gross revenues from 2004 through 2007 from non-blacknose SCS meat for the entire fishery was \$347,900. Average annual gross revenues for non-blacknose SCS fins were \$313,613, making total average annual gross revenues for non-blacknose SCS landings for the entire fishery \$661,513 (Table 6.8). Directed permit

holders landed approximately 97 percent of the non-blacknose SCS landings whereas incidental permit holders landed approximately 3 percent of the non-blacknose SCS total landings. Thus, directed permit holders earned approximately \$641,006 in average annual gross revenues from non-blacknose SCS landings whereas incidental permit holders earned approximately \$20,507 from non-blacknose SCS landings (Table 6.8). Spread amongst the directed and incidental permit holders that landed non-blacknose SCS, the average directed permit holder earned \$9,427 in average annual gross revenues ($\$641,006 / 68$ directed vessels = \$9,427 per vessel), and the average incidental permit holder earned \$707 in average annual gross revenues from non-blacknose SCS landings ($\$20,507 / 29$ incidental vessels = \$707 per vessel).

Finally, the average annual gross revenues from 2004 through 2007 from blacknose shark meat for the entire fishery were \$90,267. Average annual gross revenues for blacknose shark fins were \$81,930, making total average annual gross revenues for blacknose shark landings for the entire fishery \$172,197 (Table 6.8). Directed permit holders landed approximately 93 percent of the blacknose shark landings whereas incidental permit holders landed approximately 7 percent of the blacknose shark total landings. Thus, directed permit holders earned approximately \$160,143 in average annual gross revenues from blacknose shark landings where as incidental permit holders earned approximately \$12,054 from blacknose shark landings (Table 6.8). Spread amongst the directed and incidental permit holders that landed blacknose sharks, the average directed permit holder earned \$3,640 in average annual gross revenues ($\$160,143 / 44$ directed vessels = \$3,640 per vessel), and the average incidental permit holder earned \$1,722 in average annual gross revenues from blacknose shark landings ($\$12,054 / 7$ incidental vessels = \$1,722 per vessel).

Table 6.8 Average ex-vessel prices and average annual gross revenues from 2004-2007 under the No Action alternative, A1. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Entire Fishery</i>			
SCS	659,459	\$0.66	\$438,092
Fins	32,973	\$12.00	\$395,542
Total			\$833,634
Non-Blacknose SCS	522,864	\$0.67	\$347,900
Fins	26,143	\$12.00	\$313,613
Total			\$661,513
Blacknose	136,595	\$0.66	\$90,267
Fins	6,830	\$12.00	\$81,930
Total			\$172,197
<i>Directed Fishery</i>			
SCS	639,015	\$0.66	\$424,511
Fins	31,951	\$12.00	\$383,281
Total			\$807,792

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
Non-Blacknose SCS	506,655	\$0.67	\$337,115
Fins	25,333	\$12.00	\$303,891
Total			\$641,006
Blacknose	127,033	\$0.66	\$83,948
Fins	6,352	\$12.00	\$76,194
Total			\$160,143
<i>Incidental Fishery</i>			
SCS	20,443	\$0.66	\$13,581
Fins	1,022	\$12.00	\$12,262
Total			\$25,843
Non-Blacknose SCS	16,209	\$0.67	\$10,785
Fins	810	\$12.00	\$9,722
Total			\$20,507
Blacknose	9,562	\$0.66	\$6,319
Fins	478	\$12.00	\$5,735
Total			\$12,054

Under alternative A2, NMFS would remove blacknose sharks from the SCS quota and create a blacknose shark-specific quota and a separate “non-blacknose SCS” quota, which would apply to finetooth, Atlantic sharpnose, and bonnethead sharks. The non-blacknose SCS complex quota would be the current SCS quota (454 mt dw) minus average annual landings of blacknose sharks (136,595 lb dw or 61.5 mt dw/year; Table 4.1). This would result in a non-blacknose SCS complex quota of 392.5 mt dw/year (454 mt dw – 61.5 mt dw = 392.5 mt dw). The blacknose shark quota would be a 78-percent reduction in current landings resulting in a 13.5 mt dw or 29,762 lb dw/year quota (61.5 mt dw x 78 percent = 48 mt dw; 61.5 mt dw – 48 mt dw = 13.5 mt dw/year).

NMFS anticipates that non-blacknose SCS landings should not decrease as the non-blacknose SCS quota would only be reduced by the average blacknose shark landings. Therefore, the 68 directed vessels and 29 incidental vessels that had non-blacknose SCS landings would not be affected by the new non-blacknose SCS quota. Average annual gross revenues for non-blacknose SCS landings for the entire fishery are anticipated to be the same as under the No Action alternative, A1, or \$661,513 (Table 6.9). Therefore, economic impacts on directed and incidental shark permit holders for the non-blacknose SCS quota would be neutral under alternative A2. However, the blacknose shark quota would be a 78-percent reduction based on average landings from 2004-2007. Average annual gross revenues for the blacknose shark landings for the entire fishery would decrease from \$172,197 under the No Action alternative (Table 6.8) down to \$37,500 (Table 6.9) under alternative A2, which is a 78-percent reduction in average annual gross revenues for blacknose sharks. Thus, the 44 vessels with directed shark permits and 7 vessels with incidental shark permits that had blacknose shark landings would be affected by the new blacknose shark quota. As directed permit holders

made the majority of blacknose shark landings under the No Action alternative, it is anticipated that directed permit holders would experience the largest impacts under alternative A2. The decrease in average annual gross revenues for directed and incidental permit holders would depend on the specific trip limit associated with the blacknose quota established under A2 (see Appendix A).

Table 6.9 Average ex-vessel prices and average annual gross revenues from 2004-2007 under alternative A2. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Entire Fishery</i>			
Non-Blacknose SCS	522,864	\$0.67	\$347,900
Fins	26,143	\$12.00	\$313,613
Total			\$661,513
Blacknose	29,762	\$0.66	\$19,643
Fins	1488.1	\$12.00	\$17,857
Total			\$37,500

Under alternative A3, NMFS would remove blacknose sharks from the SCS quota and create a blacknose shark-specific quota and a separate “non-blacknose SCS” quota equal to 42.7 mt dw (94,115 lb dw), which would apply to finetooth, Atlantic sharpnose, and bonnethead sharks. The non-blacknose SCS quota would be based on a 82-percent reduction of the average current landings of finetooth, Atlantic sharpnose, and bonnethead sharks from 2004 through 2007 (Table 4.2). NMFS determined that by reducing the overall SCS fishery, NMFS could reduce the level of blacknose shark discards such that the total blacknose shark mortality would stay below the commercial allowance (see Appendix A). NMFS would establish a blacknose-specific quota of 16.6 mt dw (36,526 lb dw), which is the amount of blacknose sharks that would be harvested while the non-blacknose SCS quota is harvested (see Appendix A); however, fishermen with incidental shark permits would not be allowed to retain any blacknose sharks under alternative A3.

While trip limits would not change for non-blacknose SCS for fishermen with directed and incidental shark permits (*i.e.*, no trip limit for directed fishermen and a 16 non-blacknose SCS/pelagic sharks combined trip limit for incidental fishermen), given the reduction in the non-blacknose SCS quota, NMFS anticipates that the 68 vessels with directed shark permits and 29 vessels with incidental shark permits that had non-blacknose SCS landings would be affected by the new non-blacknose SCS quota. Average annual gross revenues for non-blacknose SCS landings for the entire fishery are anticipated to be \$119,526 (Table 6.10). This is an 82-percent reduction in average annual gross revenues compared to average annual gross revenues expected under the No Action alternative, A1 (*i.e.*, \$661,513; Table 6.8). Since directed permit holders land approximately 97 percent of the non-blacknose SCS landings as explained in alternative A1, it is anticipated that directed permit holders would lose more in average annual gross revenues from non-blacknose SCS landings compared to incidental permit holders under alternative A3. Average annual gross revenues for directed shark permit holders of non-

blacknose SCS under alternative A3 would be \$115,821 (Table 6.10), which is a loss of \$525,185 in average annual gross revenues or an 82-percent reduction in average annual gross revenues from the average annual gross revenues expected under the No Action alternative, A1 (*i.e.*, \$641,006; Table 6.8). Spread amongst the directed shark permit holders that land non-blacknose SCS, this is an anticipated loss of \$7,723 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$525,185 / 68$ directed vessels = \$7,723 per vessel). Incidental permit holders land approximately 3 percent of the non-blacknose SCS landings as explained in alternative A1. Average annual gross revenues for incidental shark permit holders of non-blacknose SCS under alternative A3 would be \$3,705 (Table 6.10), which is a loss of \$16,802 in average annual gross revenues or also an 82-percent reduction in average annual gross revenues from the average annual gross revenues expected under the No Action alternative, A1 (*i.e.*, \$20,507; Table 6.8). Spread amongst the incidental shark permit holders that land non-blacknose SCS, this is an anticipated loss of \$579 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$16,802 / 29$ incidental vessels = \$579 per vessel).

The blacknose shark quota would be a 73-percent reduction based on average landings from 2004-2007. In addition, in order to keep the total mortality of blacknose sharks below the commercial allowance for the HMS Atlantic shark fishery (see Appendix A), incidental shark permit holders would not be allowed to retain blacknose sharks under alternative A3. Thus, the 44 directed shark permit holders and 7 incidental shark permit holders that had blacknose shark landings would be affected by the new blacknose shark quota. Since incidental shark permit holders would not be able to retain blacknose sharks, the total blacknose shark quota would be available only to fishermen with directed shark permits. Average annual gross revenues for the blacknose shark landings for the directed fishery would decrease from \$172,197 under the No Action alternative (Table 6.8) down to \$46,023 under alternative A3 (Table 6.10), which is a loss of \$126,174 or a 73-percent reduction in average annual gross revenues for blacknose sharks for fishermen with directed shark permits. Spread amongst the fishermen with directed shark permits that land blacknose sharks, there could be an anticipated loss of \$2,868 in average annual gross revenues from blacknose landings per permit holder ($\$126,174 / 44$ directed vessels = \$2,868 per vessel). However, since fishermen with incidental shark permits would not be able to retain blacknose sharks, they would lose an estimated \$12,054 in average annual gross revenues from blacknose shark landings (Table 6.8). Spread amongst the fishermen with incidental shark permits that land blacknose sharks, there could be an anticipated loss of \$1,722 in average annual gross revenues from blacknose landings per permit holder ($\$12,054 / 7$ incidental vessels = \$1,722 per vessel).

Table 6.10 Average ex-vessel prices and average annual gross revenues from 2004-2007 under alternative A3. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Entire Fishery</i>			
Non-Blacknose SCS	94,115	\$0.67	\$63,057
Fins	4,706	\$12.00	\$56,469
Total			\$119,526
<i>Directed Fishery</i>			
Non-Blacknose SCS	91,197	\$0.67	\$61,102
Fins	4,560	\$12.00	\$54,718
Total			\$115,821
Blacknose	36,526	\$0.66	\$24,107
Fins	1,826	\$12.00	\$21,916
Total			\$46,023
<i>Incidental Fishery</i>			
Non-Blacknose SCS	2,918	\$0.67	\$1,955
Fins	146	\$12.00	\$1,751
Total			\$3,705

Under alternative A4, the preferred alternative, NMFS would remove blacknose sharks from the SCS quota and create a blacknose shark-specific quota and a separate “non-blacknose SCS” quota equal to 56.9 mt dw (125,487 lb dw), which would apply to finetooth, Atlantic sharpnose, and bonnethead sharks. The non-blacknose SCS quota would be based on a 76-percent reduction of the average current landings of finetooth, Atlantic sharpnose, and bonnethead sharks from 2004 through 2007 (Table 6.11). NMFS determined that by reducing the overall SCS fishery, NMFS could reduce the level of blacknose shark discards such that the total blacknose shark mortality would stay below the commercial allowance (see Appendix A). NMFS would establish a blacknose-specific quota of 14.9 mt dw (32,753 lb dw), which is the amount of blacknose sharks that would be landed while the non-blacknose SCS quota is taken (see Appendix A); however, incidental fishermen would not be allowed to retain any blacknose sharks under alternative A4. In addition, this alternative assumes that gillnet gear would not be used to harvest sharks as explained under alternatives B2 and B3.

While trip limits would not change for non-blacknose SCS for fishermen with directed and incidental shark permits (*i.e.*, no trip limit for directed fishermen and a 16 non-blacknose SCS/pelagic sharks combined trip limit for incidental fishermen), given the reduction in the non-blacknose SCS quota, NMFS anticipates that the 41 directed shark permit holders and 22 incidental shark permit holders that did not use gillnet gear to land non-blacknose SCS would be affected by the new non-blacknose SCS quota. Average annual gross revenues for non-blacknose SCS landings for the entire fishery are anticipated to be \$159,368 (Table 6.11). This is a 76-percent reduction in average annual

gross revenues compared to the average annual gross revenues expected under the No Action alternative, A1 (*i.e.*, \$661,513; Table 6.8). Since directed permit holders land approximately 97 percent of the non-blacknose SCS landings as explained in alternative A1, it is anticipated that directed permit holders would lose more in average annual gross revenues from non-blacknose SCS landings compared to incidental permit holders under alternative A4. Average annual gross revenues for directed shark permit holders of non-blacknose SCS under alternative A4 would be \$153,841 (Table 6.11), which is a loss of \$487,165 in average annual gross revenues or a 76-percent reduction in average annual gross revenues from the average annual gross revenues expected under the No Action alternative, A1 (*i.e.*, \$641,006; Table 6.8). Spread amongst the directed shark permit holders that did not use gillnet gear to land non-blacknose SCS, there could be an anticipated loss of \$11,882 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$487,165 / 41$ directed vessels = \$11,882 per vessel). Incidental permit holders land approximately 3 percent of the non-blacknose SCS landings as explained in alternative A1. Average annual gross revenues for incidental shark permit holders of non-blacknose SCS under alternative A4 would be \$4,922 (Table 6.11), which is a loss of \$15,585 in average annual gross revenues or a 76-percent reduction in average annual gross revenues from the average annual gross revenues expected under the No Action alternative, A1 (*i.e.*, \$20,507; Table 6.8). Spread amongst the incidental shark permit holders that did not use gillnet gear to land non-blacknose SCS, there could be an anticipated loss of \$708 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$15,585 / 22$ incidental vessels = \$708 per vessel).

The blacknose shark quota would also be a 76-percent reduction based on average landings from 2004-2007. In addition, in order to keep the total mortality of blacknose sharks below the commercial allowance for the HMS Atlantic shark fishery (see Appendix A), incidental shark permit holders would not be allowed to retain blacknose sharks under alternative A4. Thus, the 15 directed shark permit holders and 5 incidental shark permit holders that did not use gillnet gear to land blacknose sharks would be affected by the new blacknose shark quota. Since incidental permit holders would not be able to retain blacknose sharks, the total blacknose shark quota would be available only to directed shark permit holders. Average annual gross revenues for the blacknose shark landings for the directed fishery would decrease from \$172,197 under the No Action alternative (Table 6.8) down to \$41,269 under alternative A4 (Table 6.11), which is a loss of \$130,928 or a 76-percent reduction in average annual gross revenues from blacknose sharks for directed shark permit holders. Spread amongst the directed shark permit holders that did not use gillnet gear to land blacknose sharks, there could be an anticipated loss of \$8,729 in average annual gross revenues from blacknose landings per permit holder ($\$130,928 / 15$ directed vessels = \$8,729 per vessel). However, since incidental shark permit holders would not be able to retain blacknose sharks, they would lose an estimated \$12,054 in average annual gross revenues from blacknose shark landings (Table 6.8). Spread amongst the incidental shark permit holders that did not use gillnet gear to land blacknose sharks, there could be an anticipated loss of \$2,411 in average annual gross revenues from blacknose landings per permit holder ($\$12,054 / 5$ incidental vessels = \$2,411 per vessel).

Table 6.11 Average ex-vessel prices and average annual gross revenues for entire fishery from 2004-2007 under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Entire Fishery</i>			
Non-Blacknose SCS	125,487	\$0.67	\$84,076
Fins	6,274	\$12.00	\$75,292
Total			\$159,368
<i>Directed Fishery</i>			
Non-Blacknose SCS	121,597	\$0.67	\$80,907
Fins	6,080	\$12.00	\$72,934
Total			\$153,841
Blacknose	32,753	\$0.66	\$21,617
Fins	1,638	\$12.00	\$19,652
Total			\$41,269
<i>Incidental Fishery</i>			
Non-Blacknose SCS	3,890	\$0.67	\$2,588
Fins	195	\$12.00	\$2,333
Total			\$4,922

Alternative A4 would also prohibit the use of gillnets to land sharks as explained under alternatives B2 and B3. Alternative B2 would prohibit the landings of sharks with gillnet gear in the Atlantic, Gulf of Mexico, and Caribbean Sea. Therefore, the approximate 27 directed and 7 incidental shark permit holders that used gillnet gear to land non-blacknose SCS and the approximate 15 directed and 2 incidental shark permit holders that used gillnet gear to land blacknose sharks would experience additional losses under alternatives A4 and B2. Under alternatives A4 and B2, lost average annual gross revenues for all shark permit holders landing non-blacknose SCS using gillnet gear would be \$287,427 (Table 6.12). This is approximately 43 percent of the average annual gross revenues for the entire non-blacknose SCS fishery under the No Action alternative, A1 (*i.e.*, \$661,513; Table 6.8). Lost average annual gross revenues for directed shark permit holders using gillnet gear to land non-blacknose SCS under alternative A4 would be \$275,832 (Table 6.12), which is 45 percent of the average annual gross revenues for directed shark permit holders under the No Action alternative, A1 (*i.e.*, \$641,006; Table 6.8). Spread amongst the directed shark permit holders that land non-blacknose SCS with gillnet gear, this is an anticipated loss of \$10,216 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$275,832 / 27$ directed vessels = \$10,216 per vessel). However, since there are 5-7 gillnet vessels that primarily target non-blacknose SCS with gillnet gear, these permit holders may experience higher losses. Lost average annual gross revenues for incidental shark permit holders using gillnet gear to land non-blacknose SCS under alternative A4 would be \$11,595 (Table 6.12), which is

57 percent of the average annual gross revenues for incidental permit holders under the No Action alternative, A1 (*i.e.*, \$20,507; Table 6.8). Spread amongst the incidental shark permit holders that use gillnet gear to land non-blacknose SCS, this is an anticipated loss of \$1,656 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$11,595 / 7$ incidental vessels = \$1,656 per vessel).

Lost average annual gross revenues for all shark permit holders landing blacknose sharks using gillnet gear under alternatives A4 and B2 would be \$90,501 (Table 6.12). This is approximately 53 percent of the average annual gross revenues for the entire non-blacknose SCS fishery under the No Action alternative, A1 (*i.e.*, \$172,197; Table 6.8). Lost average annual gross revenues for directed shark permit holders using gillnet gear to land blacknose sharks under alternatives A4 and B2 would be \$90,123 (Table 6.12), which is 56 percent of the average annual gross revenues for directed permits holder under the No Action alternative, A1 (*i.e.*, \$160,143; Table 6.8). Spread amongst the directed shark permit holders that land blacknose sharks with gillnet gear, this would be a loss of \$6,008 in average annual gross revenues from blacknose shark landings per permit holder ($\$90,123 / 15$ directed vessels = \$6,008 per vessel). However, since there are 5-7 gillnet vessels that primarily target blacknose sharks with gillnet gear, these permit holders may experience higher losses. Incidental permit holders would not be allowed to retain any blacknose sharks under alternative A4, whether or not they used gillnet gear. Lost average annual gross revenues for incidental shark permit holders using gillnet gear to land blacknose sharks under alternatives A4 and B2 would be \$378 (Table 6.12), which is 2 percent of the average annual gross revenues for incidental permit holders under the No Action alternative, A1 (*i.e.*, \$20,507; Table 6.8). Spread amongst the incidental shark permit holders that use gillnet gear to land blacknose sharks, this is an anticipated loss of \$189 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$378 / 2$ incidental vessels = \$189 per vessel).

Under alternatives A4 and B3, which would prohibit the landings of sharks with gillnet gear from South Carolina south, including the Gulf of Mexico and Caribbean Sea, approximately 24 directed and 5 incidental shark permit holders that used gillnet gear to land non-blacknose SCS and approximately 13 directed and 2 incidental shark permit holders that used gillnet gear to land blacknose sharks would experience additional losses under alternatives A4 and B3. Lost average annual gross revenues for all shark permit holders landing non-blacknose SCS using gillnet gear would be \$275,008 under alternatives A4 and B3 (Table 6.12). This is approximately 42 percent of the average annual gross revenues for the entire non-blacknose SCS fishery under the No Action alternative, A1 (*i.e.*, \$661,513; Table 6.8). Lost average annual gross revenues for directed shark permit holders using gillnet gear to land non-blacknose SCS under alternatives A4 and B3 would be \$268,580 (Table 6.12), which is 42 percent of the average annual gross revenues for directed permits holder under the No Action alternative, A1 (*i.e.*, \$641,006; Table 6.8). Spread amongst the directed shark permit holders that land non-blacknose SCS with gillnet gear, this is an anticipated loss of \$11,191 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$268,580 / 24$ directed vessels = \$11,191 per vessel). However, as with alternatives A4 and B2, since there are 5-7 gillnet vessels that primarily target non-

blacknose SCS with gillnet gear, these permit holders may experience higher losses. Lost average annual gross revenues for incidental shark permit holders using gillnet gear to land non-blacknose SCS under alternatives A4 and B3 would be \$6,429 (Table 6.12), which is 31 percent of the average annual gross revenues for incidental permit holders under the No Action alternative, A1 (*i.e.*, \$20,507; Table 6.8). Spread amongst the incidental shark permit holders that use gillnet gear to land non-blacknose SCS, this is an anticipated loss of \$1,286 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$6,429 / 5$ incidental vessels = \$1,286 per vessel).

Lost average annual gross revenues for all shark permit holders landing blacknose sharks using gillnet gear under alternatives A4 and B3 would be \$90,059 (Table 6.12). This is approximately 53 percent of the average annual gross revenues for the entire non-blacknose SCS fishery under the No Action alternative, A1 (*i.e.*, \$172,197; Table 6.8). Lost average annual gross revenues for directed shark permit holders using gillnet gear to land blacknose sharks under alternatives A4 and B3 would be \$89,681 (Table 6.12), which is 56 percent of the average annual gross revenues for directed permits holder under the No Action alternative, A1 (*i.e.*, \$160,143; Table 6.8). Spread amongst the directed shark permit holders that land blacknose sharks with gillnet gear, this would be a loss of \$6,899 in average annual gross revenues from blacknose shark landings per permit holder ($\$89,681 / 13$ directed vessels = \$6,899 per vessel). However, as with alternatives A4 and B2, since there are 5-7 gillnet vessels that primarily target blacknose sharks with gillnet gear, these permit holders may experience higher losses. Incidental permit holders would not be allowed to retain any blacknose sharks under alternative A4, whether or not they used gillnet gear. Lost average annual gross revenues for incidental shark permit holders using gillnet gear to land blacknose sharks under alternatives A4 and B3 would be \$378 (Table 6.12), which is 2 percent of the average annual gross revenues for incidental permit holders under the No Action alternative, A1 (*i.e.*, \$20,507; Table 6.8). Spread amongst the incidental shark permit holders that use gillnet gear to land blacknose sharks, this is an anticipated loss of \$189 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$378 / 2$ incidental vessels = \$189 per vessel).

Table 6.12 Lost average annual gross revenues (from 2004-2007) for vessels that fish for non-blacknose SCS and blacknose sharks with gillnet gear under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Under Alternative B2</i>			
<i>Entire Fishery</i>			
Non-Blacknose SCS	227,184	\$0.67	\$151,162
Fins	11,359	\$12.00	\$136,265
Total			\$287,427
Blacknose	71,827	\$0.66	\$47,406
Fins	3,591	\$12.00	\$43,096
Total			\$90,501

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Directed Fishery</i>			
Non-Blacknose SCS	218,019	\$0.67	\$145,064
Fins	10,901	\$12.00	\$130,768
Total			\$275,832
Blacknose	71,527	\$0.66	\$47,208
Fins	3,576	\$12.00	\$42,916
Total			\$90,123
<i>Incidental Fishery</i>			
Non-Blacknose SCS	9,165	\$0.67	\$6,098
Fins	458	\$12.00	\$5,497
Total			\$11,595
Blacknose	300	\$0.66	\$198
Fins	15	\$12.00	\$180
Total			\$378
<i>Under Alternative B3</i>			
<i>Entire Fishery</i>			
Non-Blacknose SCS	217,368	\$0.67	\$144,631
Fins	10,868	\$12.00	\$130,377
Total			\$275,008
Blacknose	71,475	\$0.66	\$47,174
Fins	3,574	\$12.00	\$42,885
Total			\$90,059
<i>Directed Fishery</i>			
Non-Blacknose SCS	212,287	\$0.67	\$141,250
Fins	10,614	\$12.00	\$127,329
Total			\$268,580
Blacknose	71,175	\$0.66	\$46,976
Fins	3,559	\$12.00	\$42,705
Total			\$89,681
<i>Incidental Fishery</i>			
Non-Blacknose SCS	5,081	\$0.67	\$3,381
Fins	254	\$12.00	\$3,048
Total			\$6,429
Blacknose	300	\$0.66	\$198
Fins	15	\$12.00	\$180
Total			\$378

In addition, LCS are also landed with gillnet gear. Therefore, alternative A4 in combination with alternatives B2 and B3 would also impact LCS fishermen using gillnet gear. Therefore, the approximate 11 directed and 5 incidental shark permit holders that used gillnet gear to land LCS would experience additional losses under alternatives A4 and B2. Under alternatives A4 and B2, which would prohibit the landings of sharks with gillnet gear in the Atlantic, Gulf of Mexico, and Caribbean Sea, lost average annual gross revenues for all vessels landing LCS using gillnet gear would be \$109,339 (Table 6.13). This is approximately 3 percent of the average annual gross revenues for the entire LCS fishery under the No Action alternative, A1 (*i.e.*, \$3,328,663; Table 6.14). Under alternatives A4 and B2, LCS fishermen that do not use gillnet gear to land LCS would earn average annual gross revenues of \$3,219,324 from LCS landings, which is approximately 97 percent of the average annual gross revenues from LCS landings under the status quo (Table 6.14). Lost average annual gross revenues for directed shark permit holders using gillnet gear to land LCS under alternative A4 would be \$107,280 (Table 6.13). Spread amongst the directed shark permit holders that land LCS with gillnet gear, this is an anticipated loss of \$9,494 in average annual gross revenues from LCS landings per permit holder ($\$107,280 / 11$ directed vessels = \$9,494 per vessel). Lost average annual gross revenues for incidental shark permit holders using gillnet gear to land LCS under alternative A4 would be \$2,059 (Table 6.13). Spread amongst the incidental shark permit holders that use gillnet gear to land LCS, this is an anticipated loss of \$429 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$2,059 / 5$ incidental vessels = \$429 per vessel).

Under alternatives A4 and B3, which would prohibit the landings of sharks with gillnet gear from South Carolina south, including the Gulf of Mexico and Caribbean Sea, approximately 10 directed and 2 incidental shark permit holders that used gillnet gear to land LCS would experience additional losses under alternatives A4 and B3. Lost average annual gross revenues for all vessels landing LCS using gillnet gear would be \$106,479 under alternatives A4 and B3 (Table 6.13). This is approximately 3 percent of the average annual gross revenues for the entire LCS fishery under the status quo (*i.e.*, \$3,328,663; Table 6.14). Under alternatives A4 and B3, LCS fishermen that do not use gillnet gear to land LCS would earn average annual gross revenues of \$3,222,183 from LCS landings, which is approximately 97 percent of the average annual gross revenues under the status quo (Table 6.14). Lost average annual gross revenues for directed shark permit holders using gillnet gear to land LCS under alternatives A4 and B3 would be \$106,189 (Table 6.13). Spread amongst the directed shark permit holders that land LCS with gillnet gear, this is an anticipated loss of \$10,619 in average annual gross revenues from LCS landings per permit holder ($\$106,189 / 10$ directed vessels = \$10,619 per vessel). Lost average annual gross revenues for incidental shark permit holders using gillnet gear to land LCS under alternatives A4 and B3 would be \$290 (Table 6.13). Spread amongst the incidental shark permit holders that use gillnet gear to land LCS, this is an anticipated loss of \$145 in average annual gross revenues from non-blacknose SCS landings per permit holder ($\$290 / 2$ incidental vessels = \$145 per vessel).

Table 6.13 Lost average annual gross revenues (from 2004-2007) for vessels that fish for LCS with gillnet gear under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Under Alternative B2</i>			
<i>Entire Fishery</i>			
LCS	104,132	\$0.45	\$46,859
Fins	5,207	\$12.00	\$62,479
Total			\$109,339
<i>Directed Fishery</i>			
LCS	102,171	\$0.45	\$45,977
Fins	5,109	\$12.00	\$61,303
Total			\$107,280
<i>Incidental Fishery</i>			
LCS	1,961	\$0.45	\$882
Fins	98	\$12.00	\$1,177
Total			\$2,059
<i>Under Alternative B3</i>			
<i>Entire Fishery</i>			
LCS	101,409	\$0.45	\$45,634
Fins	5,070	\$12.00	\$60,845
Total			\$106,479
<i>Directed Fishery</i>			
LCS	101,132	\$0.45	\$45,509
Fins	5,057	\$12.00	\$60,679
Total			\$106,189
<i>Incidental Fishery</i>			
LCS	276	\$0.45	\$124
Fins	14	\$12.00	\$166
Total			\$290

Table 6.14 Average annual gross revenues (from 2004-2007) of vessels that land LCS but do not use gillnet gear under alternative A4. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Status Quo</i>			
LCS	3,170,155	\$0.45	\$1,426,570
Fins	158,508	\$12.00	\$1,902,093
Total			\$3,328,663
<i>Under Alternative B2</i>			
<i>Entire Fishery</i>			
LCS	3,066,023	\$0.45	\$1,379,710

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
Fins	153,301	\$12.00	\$1,839,614
Total			\$3,219,324
<i>Under Alternative B3</i>			
<i>Entire Fishery</i>			
LCS	3,068,746	\$0.45	\$1,380,936
Fins	153,437	\$12.00	\$1,841,248
Total			\$3,222,183

Alternative A5 would close the entire SCS commercial shark fishery, prohibiting the landing of any SCS, including blacknose sharks. Thus, this alternative would eliminate landings of all SCS, including finetooth, Atlantic sharpnose, bonnethead, and blacknose sharks. This would have negative economic impacts on the average 85 directed shark permit holders, and the average 31 incidental shark permit holders that had SCS landings during 2004-2007. This would result in a loss of average annual gross revenues of \$661,513 for non-blacknose SCS and \$172,197 from blacknose shark landings for a total loss of \$833,710 in average annual gross revenues from SCS landings. Directed shark permit holders would lose \$641,006 in average annual gross revenues from non-blacknose SCS landings and \$160,143 in average annual gross revenues from blacknose shark landings for a total of \$801,149 in average annual gross revenues (Table 6.15). Spread among the 85 directed shark permit holders that land LCS with gillnet gear, this could result in a loss in average annual gross revenues of \$9,426 per permit holder ($\$801,149 / 85 \text{ vessels} = \$9,426$).

Incidental permit holders would lose \$20,507 in average annual gross revenues from non-blacknose SCS landings and \$12,054 in average annual gross revenues from blacknose shark landings for a total of \$32,561 in average annual gross revenues under alternative A5 (Table 6.15). Spread among the 31 incidental shark permit holders that land SCS, this could result in a loss in average annual gross revenues of \$1,050 per permit holder ($\$32,561 / 31 \text{ incidental vessels} = \$1,050$).

In addition, as gillnet gear is the primary gear used to target SCS, it is assumed that directed shark gillnet fishing would end, except for fishermen that use gillnet gear to strikenet for blacktip sharks. Approximately 11 directed shark permit holders use gillnet gear to land LCS. This would result in a decrease in LCS landings of 102,171 lb dw and a decrease in average annual gross revenues of \$107,280. Spread among the 11 directed shark permit holders that land LCS with gillnet gear, this could result in a loss in average annual gross revenues of \$9,753 per permit holder ($\$107,280 / 11 \text{ vessels} = \$9,753$). However, while this alternative could reduce blacknose mortality below the commercial allowance of 44,853.8 lb dw, it would also completely eliminate the fishery for all SCS. This would severely curtail data collection on all SCS that could be used for future stock assessments.

Table 6.15 Lost average annual gross revenues (from 2004-2007) for vessels landings non-blacknose SCS, blacknose sharks, and LCS under alternative A5. Shark fins are assumed to be 5 percent of the carcass weight.

Species	Average Landings (lb dw)	Average Ex-Vessel Price	Average Annual Gross Revenues
<i>Entire Fishery</i>			
Non-Blacknose SCS	522,864	\$0.67	\$347,900
Fins	26,143	\$12.00	\$313,613
Total			\$661,513
Blacknose	136,595	\$0.66	\$90,267
Fins	6,830	\$12.00	\$81,930
Total			\$172,197
<i>Directed Fishery</i>			
Non-Blacknose SCS	506,655	\$0.67	\$337,115
Fins	25,333	\$12.00	\$303,891
Total			\$641,006
Blacknose	127,033	\$0.66	\$83,948
Fins	6,352	\$12.00	\$76,194
Total			\$160,143
LCS	102,171	\$0.45	\$45,977
Fins	5,109	\$12.00	\$61,303
Total			\$107,280
<i>Incidental Fishery</i>			
Non-Blacknose SCS	16,209	\$0.67	\$10,785
Fins	810	\$12.00	\$9,722
Total			\$20,507
Blacknose	9,562	\$0.66	\$6,319
Fins	478	\$12.00	\$5,735
Total			\$12,054

NMFS prefers alternative A4 at this time, because by reducing the overall SCS fishery, NMFS could reduce the level of blacknose shark discards such that the total blacknose shark mortality would stay below the commercial allowance needed in order to rebuild the stock. Under alternative A4, blacknose shark landings would decrease by 76 percent and discards would decrease by 81 percent (Table 4.4). Landings for non-blacknose SCS would also decrease by 76 percent and discards could decrease by 2-3 percent (Table 4.4). In addition, alternative A4 in combination with alternatives B2 or B3 could decrease landings of LCS by only three percent, but could decrease discards of LCS by up to 15 percent (Table 4.4). These reductions in landings of non-blacknose SCS and blacknose sharks would also result in a 76-percent reduction in average annual gross revenues from non-blacknose SCS and blacknose shark landings overall. However, such a reduction is needed to lower the overall mortality on blacknose sharks (see Appendix A). While gillnet fishermen would be impacted the most and would have estimated annual gross revenue losses between \$377,928 and \$365,067, alternative A4 would allow

for a higher non-blacknose SCS than blacknose shark quota (56.9 mt dw) compared to alternative A3 (42.7 mt dw) because associated gillnet effort is anticipated to decline more under alternative A4, leaving a larger available quota for the rest of the SCS fishery. This higher quota would benefit the larger SCS fishery, while the prohibition of gillnet gear would affect a small number of shark fishermen that use gillnet gear. For instance, under alternative A3, expected average annual gross revenues are \$165,549 from SCS landings whereas under alternative A4, expected average annual gross revenues are \$200,637 from SCS landings. Under alternative A5, the expected losses in average annual gross revenues from lost SCS landings is \$833,710, which is the largest negative economic impact of all the alternatives considered, given the entire SCS fishery would be closed. Therefore, NMFS prefers alternative A4 at this time.

6.4.1.2 SCS Commercial Gear Restrictions

Under alternative B1, the No Action alternative, NMFS would maintain the current gear restrictions for rod and reel, gillnet, and BLL gear. Therefore, the economic impacts of alternative B1 would be the same as the status quo, and no negative social or economic impacts would be anticipated under alternative B1. On average from 2004-2007, the directed and incidental shark permit holders retained average annual gross revenues from SCS landings of \$833,634, while the directed and incidental shark permit holders retaining LCS had larger gross revenues of \$3,328,663. The smooth dogfish fishery is smaller than the other fisheries and has average annual gross revenues of \$371,786 for state and federally permitted fishermen reporting to the ACCSP. Based on this alternative, the average annual gross revenues of these fisheries would remain the same as the status quo. The average number of directed and incidental shark permit holders that reported SCS landings in the Coastal Fisheries logbook from 2004-2007 were 116 (85 directed and 31 incidental shark permit holders), and the LCS fishery had an annual average of 162 permit holders (129 directed and 33 incidental shark permit holders) reporting LCS landings in the Coastal Fisheries logbook from 2004-2007. The number of permit holders would not be impacted by the No Action alternative.

Under alternative B2, which would close the shark gillnet fishery, NMFS would remove gillnet gear as an authorized gear type for commercial shark fishing. This alternative would have significant negative economic impacts by potentially affecting 30 directed and 7 incidental permit holders that land SCS. Also, this restriction would have a considerable impact on the total landings/year of SCS. Gillnets are the dominant gear type in the SCS fishery. On average, directed shark permit holders landed 289,546 lb dw of SCS with gillnet gear. This is equivalent to \$365,955 in lost average annual gross revenues from SCS landings for directed shark permit holders. Based on average ex-vessel prices per pound from 2004-2007, directed fishermen earned \$807,792 in average annual gross revenues from SCS landings. On average, incidental shark permit holders landed 9,465 lb dw of SCS with gillnet gear. This is equivalent to \$11,973 in lost average annual gross revenues from SCS landings for incidental shark permit holders due to the prohibition of gillnet gear. Based on average ex-vessel prices per pound from 2004-2007, incidental shark permit holders earned \$25,843 from SCS landings under the status quo. This represents a 45 percent reduction in SCS revenues for directed shark

permit holders and a 46 percent reduction in SCS revenues for incidental shark permit holders compared to the No Action alternative, alternative B1.

This alternative would have a minimal negative economic impact on the LCS fishery. Only 11 directed and 5 incidental shark permit holders out of the 162 total shark permit holders would be affected. On average, directed shark permit holders landed 102,171 lb dw of LCS with gillnet gear. This is equivalent to \$107,280 in lost average annual gross revenues from LCS landings (3 percent reduction). On average, incidental shark permit holders landed 1,961 lb dw of LCS with gillnet gear. This is equivalent to \$2,059 in lost average annual gross revenues from LCS landings for incidental shark fishermen due to the prohibition of gillnet gear. In total (\$109,339), this is approximately 3 percent of the gross revenues for the entire LCS fishery under the status quo (*i.e.*, \$3,328,663).

Gillnets are also the primary gear type used to catch smooth dogfish. Within the VTR data, a primarily Northeast U.S. reporting system, an average of 213 vessels reported smooth dogfish landings per year between 2004 and 2007. Within the Coastal Fisheries Logbooks data, a primarily Southeast U.S. reporting system, an average of 10 vessels reported smooth dogfish landings per year between 2004 and 2007. From this data, an estimate of 223 vessels would require a smooth dogfish permit; however, as fishermen are currently not required to have a permit to retain smooth dogfish, this could be an underestimate of the number of fishermen that would require a federal commercial permit for smooth dogfish in the future. The average total landings/year of smooth dogfish from 1998-2007 were 950,859 lb dw/year (by state and federally permitted fishermen reporting to the ACCSP, however, since fishermen do not have to currently report smooth dogfish landings, this could be an underestimate of total landings, and thus, an underestimate of average annual gross revenues for this fishery). Based on average ex-vessel prices per pound from 2004-2007, average annual gross revenues for the entire smooth dogfish fishery totaled \$371,786 from smooth dogfish landings. If NMFS prefers alternative F2, which would require fishermen who fish for smooth dogfish in federal waters to obtain a federal smooth dogfish permit, then under alternative B2, those fishermen would not be able to use gillnet gear to land smooth dogfish. This would have a negative economic impacts on fishermen who previously used gillnet gear in federal waters to land smooth dogfish. However, as fishermen do not have to have a federal permit currently to land smooth dogfish, NMFS is uncertain of the universe of fishermen who might be affected by alternatives B2 and F2 at this time. However, given the potential large negative economic impacts of this alternative to the SCS, LCS, and smooth dogfish fisheries, NMFS does not prefer this alternative B2 at this time.

Under alternative B3, the preferred alternative, NMFS would close the commercial gillnet fishery from South Carolina south, including the Gulf of Mexico and Caribbean Sea. This would have a negative economic impact on federally permitted directed and incidental shark permit holders. In the SCS fishery, this alternative would affect 27 directed and 5 incidental shark permit holders out of the 116 total shark permit holders that landed SCS. The SCS gillnet fishery from South Carolina south accounts for 44 percent of the total shark landings by directed shark permit holders, and 26 percent of

landings by incidental permit holders. On average, directed shark permit holders landed 283,462 lb dw (\$358,261) of SCS with gillnet gear. Thus, directed shark fishermen would lose \$358,261 in average annual gross revenues from SCS landings from the gillnet prohibition under alternative B3. Based on average ex-vessel prices from 2004-2007, directed fishermen earned \$807,792 in average annual gross revenues from SCS landings. On average, incidental shark permit holders landed 5,381 lb dw (\$6,807) of SCS with gillnet gear from South Carolina south. Thus, incidental shark fishermen would lose \$6,807 in average annual gross revenues from non-blacknose SCS landings under alternative B3. The directed and incidental shark permit holders would lose average annual gross revenues of \$365,068 from their current gross revenues of \$833,634.

This alternative would have minor economic impacts on the LCS fishery. It would only affect 12 directed and incidental shark permit holders (162 total shark permit holders). The directed shark permit holders would lose \$106,189 in average annual gross revenues from lost LCS landings in gillnet gear from South Carolina south under alternative B3. Incidental fishermen shark permit holders would lose \$290 from lost LCS landings in gillnet gear from South Carolina south. In total (\$106,479), this is only 3 percent of the average annual gross revenues (*i.e.*, \$3,328,663) from LCS landings for the LSC fishery under the status quo.

Alternative B3, in combination with the preferred alternative F2, would not affect the economics impacts of the smooth dogfish fishery. Smooth dogfish are primarily caught from North Carolina north. The average total landings/year are 950,859 lb dw/year (by state and federally permitted fishermen reporting to the ACCSP, however, since fishermen do not have to currently report smooth dogfish landings, this could be an underestimate of total landings, and thus, an underestimate of average annual gross revenues for this fishery), which translates into average annual gross revenues of \$371,786 lb dw/year from smooth dogfish landings. Given smooth dogfish are not typically landed with gillnet gear from South Carolina south, it is anticipated that this alternative, in combination with the preferred alternative F2, would not cause any loss in average annual gross revenues from smooth dogfish landings. Since this alternative would assist NMFS in reaching the commercial allowance for blacknose sharks for the commercial shark fishery, and has minimal economic impacts to LCS and smooth dogfish shark fishermen, NMFS prefers this alternative at this time.

6.4.1.3 Pelagic Shark Effort Controls

Currently, on average, 72.5 mt dw of shortfin mako sharks were commercially landed between 2004 and 2007. Based on the median real dollar, ex-vessel price per pound of \$1.59 for meat and \$12.00 for fins, for shortfin mako sharks during the same timeframe, this is equivalent to \$350,039 in annual revenues. Because the No Action Alternative, alternative C1, would not modify or alter commercial fishing practices for shortfin mako sharks or other shark species, it would likely not result in any adverse economic impacts.

Alternative C2 would implement a species-specific quota for shortfin mako at the level of the average annual commercial landings for this species. This alternative is expected to have neutral or slightly negative socio-economic impacts. On average, 72.5 mt dw (159,834 lb dw) of shortfin mako sharks were commercially landed between 2004 and 2007. Based on the median real dollar, ex-vessel price per pound of \$1.59 for shortfin mako shark meat, multiplied by the average shortfin mako landings from 2004-2007 (159,834 lb dw), this is equivalent to \$254,135 in annual revenues. Fin weight was calculated by using the standard fin to carcass ratio of 5 percent dressed weight. Using this ratio, of the 159,834 lb dw of shortfin mako, approximately 7,992 lb dw would have been shortfin mako shark fins. The fin weight was then multiplied by the median fin price per pound from 2004 to 2007 (\$12.00) to generate estimated annual economic revenues from the fins of shortfin mako sharks of \$95,904. Therefore, the estimated annual revenues for both the meat and fins of shortfin mako shark landings from 2004-2007 is equal to approximately \$350,039. While fishermen would be able to maintain current fishing effort under this alternative, any increase in effort would be restricted by the species-specific quota of 72.5 mt dw. Under the No Action alternative, commercial fishermen currently have a 488 mt dw quota which could potentially be filled entirely by shortfin mako landings. Based on the median real dollar, ex-vessel price per pound of \$1.59 for shortfin mako sharks, a quota of 488 mt dw could result in maximum annual gross revenues equal to \$1,710,593. Thus, if the quota is reduced to 72.5 mt dw, which equals \$254,135 in ex-vessel annual gross revenues, this could potentially result in a loss of annual gross revenues of \$1,456,458 for commercial fishermen; however, given shortfin mako sharks are caught incidentally in the PLL fishery, it is unlikely that the entire pelagic shark quota would be entirely filled with shortfin mako landings. NMFS does not prefer this alternative at this time because the United States contributes a small portion of shortfin mako shark mortality due to the lack of a directed fishery compared to other foreign nations, including contracting parties to ICCAT. The 2008 ICCAT stock assessment did not recommend a TAC that was necessary for ending overfishing of shortfin mako sharks, and no international fishery management organization in which the United States participates, including ICCAT, has set a species-specific quota for shortfin mako sharks.

Alternative C3 would remove shortfin mako sharks from the pelagic shark species complex and add them to the prohibited species list. This alternative is expected to have only slightly negative economic impacts for commercial fishermen because it is not a species that is targeted by commercial fishermen. Shortfin mako sharks are predominately caught incidentally in the PLL fishery, and on average, the commercial landings for shortfin mako sharks from 2004 to 2007 were 72.5 mt dw. Based on the median real dollar, ex-vessel prices per pound of \$1.59, this is equivalent to \$254,135 in annual gross revenues. However, since shortfin mako sharks would be placed on the prohibited species list under alternative C3, there could be an estimated reduction in annual gross revenues of \$254,135 to commercial fishermen. In addition, this alternative could lead to increased operation time if commercial fishermen have to release and discard all shortfin mako sharks that are caught on PLL gear. In addition, if the commercial PLL fleet expands in the future, placing shortfin mako sharks on the

prohibited species list could result in a loss of future revenues for the commercial PLL fishery.

Potential economic impacts of implementing alternatives C4a or C4b were assessed by estimating the annual mt dw of shortfin mako sharks that would normally be landed for sale, which would have to be released under these alternatives. The size limits in alternatives C4a and C4b would restrict the harvest of smaller shortfin mako sharks. To assess the impact of the size limits, NMFS calculated the average dressed weight percentage of shortfin mako sharks retained below each size limit using POP data and then applied to landings data from the 2008 SAFE Report. Because the POP data is recorded as number of individuals caught, the data needed to be converted into dressed weight. This was accomplished by utilizing records of shortfin mako sharks that were recorded as kept and had an associated length measurement in the POP data. Fork lengths were converted into pounds dressed weight, and each conversion was multiplied by the number of sharks kept at each fork length. The dressed weights of individual sharks were then summed to get a total dressed weight for all shortfin mako sharks kept in the PLL and BLL fisheries (*i.e.*, 184,803.1 lb dw).

For alternative C4a, the summed dressed weight of all kept shortfin mako sharks under the 32 in. IDL size limit was 2,550.5 lb dw. This made up 1.4 percent of total dressed weight landings of shortfin mako sharks $((2,550.5 / 184,803.1) * 100)$. This percentage was then applied to the average commercial landings found in the 2008 SAFE Report from 2004-2007 (*i.e.*, 158,884.8 lb dw) to determine the estimated dressed weight of shortfin mako sharks that would be unavailable for landing under alternative C4a $(158,884.8 \text{ lb dw} * 1.4 \text{ percent} = 2,061.1 \text{ lb dw})$ (Table 6.16). The 2,061.1 lb dw of unavailable shortfin mako shark meat was then multiplied by the median price per pound estimate (\$1.59) for shortfin mako sharks from 2004 to 2007 to generate an estimated annual economic loss of \$3,277. Fin weight was calculated by using the standard fin to carcass ratio of 5 percent dressed weight. Using this ratio, 103 lb of fins would be unavailable for harvest. The unavailable fin weight was then multiplied by the median fin price per pound from 2004 to 2007 (\$12.00) to generate an estimated annual economic loss of \$1,236 in gross revenues. Economic losses of meat and fins were then summed to calculate a total economic loss of \$4,513 in annual gross revenues under alternative C4a.

For alternative C4b, the summed dressed weight of all kept shortfin mako sharks under the 22 in IDL size limit was 39.7 lb dw. This made up 0.02 percent of dressed weight landings of shortfin mako sharks $((39.7 / 184,803.1) * 100)$. This percentage was then applied to the average commercial landings found in the 2008 SAFE Report from 2004-2007 (*i.e.*, 158,884.8 lb dw) to determine the estimated dressed weight of shortfin mako sharks that would be unavailable for landing under alternative C4b $(158,884.8 \text{ lb dw} * 0.02 \text{ percent} = 34.3 \text{ lb dw})$ (Table 6.16). The 34.3 lb dw of unavailable shortfin mako shark was then multiplied by the median price per pound estimate (\$1.59) for shortfin mako sharks from 2004 to 2007 to generate an estimated annual economic loss of \$55 in annual gross revenues. Fin weight was calculated by using the standard fin to carcass ratio of 5 percent dressed weight. Using this ratio, 1.72 lb of fins would be

unavailable for harvest. The unavailable fin weight was then multiplied by the median fin price per pound from 2004 to 2007 (\$12.00) to generate an estimated annual economic loss of \$20.64 in gross revenues. Economic losses of meat and fins were then summed to calculate a total economic loss of \$75 in annual gross revenues under alternative C4b.

Table 6.16 Estimates of shortfin mako shark landings (lb dw) reductions according to size restrictions proposed in alternatives C4a and C4b.

Alternative	Size Limit (inches IDL)	Average shortfin mako shark commercial landings (lb dw) from 2004-2007 (2008 Safe Report)	Percentage of total landings (lb dw) of shortfin mako sharks below size limit (POP)	Estimated total weight (lb dw) of shortfin mako shark prohibited.
C4a	32	159,884.75	1.4	2,061.1
C4b	22	159,884.75	0.02	34.3

Alternatives C4a and C4b would have minor economic impacts because only a small percentage of commercial landings would be affected by the size restrictions. Of the two alternatives, the negative economic impact of C4a would be greater, as commercial landings by weight are 2,026.8 lb dw greater than in alternative C4b. Despite these minor economic impacts, since the size limits would not reduce fishing mortality of shortfin mako sharks in the commercial sector, NMFS does not prefer this alternative at this time.

Under alternative C5, the preferred alternative, NMFS would take action at the international level through international fisheries management organizations to develop management measures applicable to all participating nations to end overfishing of shortfin mako sharks. In the short term, this alternative would not result in any negative economic impacts on commercial fishermen as it would not restrict commercial harvest of shortfin mako sharks, nor alter the pelagic shark quota. Therefore, the economic impacts of alternative C5 would be the same as described in the No Action alternative, alternative C1. However, although this alternative could have negative economic impacts in the long term if management measures were adopted by the United States that would reduce landings domestically for shortfin mako sharks. Those recommendations would ultimately help end overfishing of shortfin mako in the long term. Therefore, NMFS prefers alternative C5 at this time.

Alternative C6, the preferred alternative, would promote the release of shortfin mako sharks brought to fishing vessels alive. This alternative would likely not result in any negative economic or social impacts as it does 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. However, as this alternative could result in the reduction of fishing mortality of shortfin mako sharks by encouraging fishermen to release shortfin mako sharks brought to the fishing vessel alive, NMFS prefer this alternative at this time.

6.4.2 Recreational Measures

6.4.2.1 Small Coastal Sharks

Under alternative D1, the No Action alternative, NMFS would maintain the current recreational management measures, including the current retention limits and size limits for SCS. Therefore, the economic impacts of alternative D1 would be the same as the status quo, and no negative social or economic impacts would be anticipated under alternative D1. However, as this alternative would not help rebuild blacknose sharks, as explained in the ecological impacts of this section in Chapter 4, NMFS does not prefer this alternative at this time.

Alternative D2 would modify the minimum recreational size for blacknose sharks based on the biology of blacknose sharks. This would lower the current size limit from 54 inches FL to 36 inches FL, the size at which 50 percent of the female blacknose sharks reach sexual maturity. This could increase the landings of recreationally harvested blacknose sharks and, therefore, have positive economic impacts for recreational fishermen. Since this alternative could result in the increase of blacknose shark recreational landings, and NMFS needs to reduce the number of blacknose shark landings in order to rebuild the stock, NMFS does not prefer this alternative at this time.

Alternative D3 would increase the retention limit for Atlantic sharpnose sharks based on their current catches and stock status. Any increase in the retention limit for Atlantic sharpnose sharks would provide positive economic impacts for recreational fishermen, especially if this resulted in more charter trips for charter/headboats. However, since the latest stock assessment suggests that increased fishing efforts could result in an overfished status and/or cause overfishing to occur in the future (NMFS, 2007), NMFS does not prefer this alternative at this time.

Under alternative D4, the preferred alternative, NMFS would prohibit the retention of blacknose sharks in the recreational fishery. While recreational fishermen could still catch blacknose sharks, they would not be permitted to retain blacknose sharks and would have to release them. This could have negative economic impacts on recreational fishermen, including tournaments and charter/headboats if the prohibition of blacknose sharks resulted in fewer charters. However, since blacknose sharks are not one of the primary species targeted by recreational anglers, in tournaments, or on charters, NMFS does not anticipate large negative economic impacts from this alternative on recreational anglers, tournaments, or in the charter/headboat sector. Therefore, NMFS prefers this alternative at this time.

6.4.2.2 Pelagic Sharks

Alternative E1 would likely not result in any adverse economic or social impacts as the No Action alternative would not substantially modify or alter recreational fishing practices for shortfin mako sharks or other shark species.

Alternative E2a would have the most severe economic impacts, as almost all of the reported shortfin mako sharks landed (99.5 percent) were smaller than the 108 inch FL size limit and would have to be released. This alternative would basically create a catch-and-release fishery for shortfin mako sharks. The impacts of alternative E2b would be less severe than alternative E2a, but would result in a 60.3 percent overall reduction in recreational shortfin mako shark landings. Under this alternative, economic impacts would be greater on the non-tournament recreational mako shark fishery, as 81 percent of those landings would fall below the 73 inch FL size limit. The percentage of recreational landings during tournaments that would be released under alternative E2b would be less than the non-tournament recreational landings (51.7 percent to 81 percent, respectively). According to LPS data, 41 percent of shortfin mako sharks caught are kept (Table 6.17); therefore the size limit in alternatives E2 may have a substantial economic impact on the recreational fishery.

Table 6.17 Total number of shortfin mako sharks reported to the LPS from 2004 to 2008.

Year	Kept	Released Alive	Discard Dead	Total
2004	4640	6731	17	11389
2005	2732	3086	7	5825
2006	3639	5485	0	9123
2007	2283	3363	0	5647
2008	2348	3524	0	5872
Total	15643	22189	24	37856
Average	3129	4438	5	7571
% of Average	41%	59%	0%	100%

Under alternative E3, NMFS would establish a foundation through international fisheries management organizations, such as ICCAT to end overfishing of shortfin mako sharks. This alternative would not result in any changes in the current recreational regulations regarding bag or size limits for shortfin mako sharks. Therefore, this alternative would likely not result in any negative social or economic impacts for recreational fishermen compared to the No Action alternative, alternative E1.

Under alternative E4, NMFS would promote the live release of shortfin mako sharks in the recreational shark fishery, but this alternative would not result in any changes in the current recreational regulations regarding bag or size limits for shortfin mako sharks. Therefore, this alternative would likely not result in any negative social or economic impacts compared to the No Action alternative, alternative E1.

Under alternative E5, NMFS would remove shortfin mako sharks from the authorized species list and add them to the prohibited species list. Placing shortfin mako sharks on the prohibited species list would essentially make it a recreational catch and release fishery for this species. According to recreational landings data, on average 3,682 shortfin mako sharks were landed from 2004 to 2007 (NMFS, 2008). Although a small number of shortfin mako sharks were landed in the recreational fishery during this time period, it is also an important fishing tournament species. Fishing tournaments are an important component of HMS recreational fisheries. In 2007, there were 42 shark tournaments throughout the U.S. Atlantic Coast, including the Gulf of Mexico and the

Caribbean Sea. Therefore, adding this species to the prohibited species list could lead to negative socioeconomic impacts for fishermen who participate in recreational shark tournaments that would no longer be able to retain this species during recreational fishing or tournaments.

6.4.3 Smooth Dogfish

While data regarding stock status and participants in the fishery is sparse, a number of sources exist that summarize any reports of smooth dogfish catches. These sources, particularly the ACCSP for commercial catches and the MRFSS for recreational catches, offer insight into current state of the fishery. A third source, NMFS' Science and Technology's (S&T) Annual Commercial Landings Statistics, available on the S&T webpage, is also available, however this system only contains non-confidential landings data and does not report any confidential numbers. For this reason, ACCSP data was used instead of S&T data for analysis.

Alternative F1 would likely not have any new social or economic impacts beyond the status quo, as no action would be taken. However, applying the No Action alternative would preclude gathering fishery participant information. Therefore, NMFS does not prefer this alternative at this time.

Implementing federal management of smooth dogfish through alternative F2 would focus on characterizing the fishery and stock status, and would not actively change catch levels or rates. Therefore, this alternative would likely not have significant positive or negative social or economic impacts, except that fishermen would have to purchase an open access smooth dogfish commercial fishing permit and dealers would have to report smooth dogfish landings through HMS dealer reports or SAFIS if they are not already reporting through another system. However, if the federal permitting system creates enough of an inconvenience as to prevent some participants from remaining in the fishery, negative economic impacts could result. Utilizing VTR and Coastal Fisheries Logbook data, an estimate of the number of participants with current federal permits in the commercial smooth dogfish fishery could be calculated. Within the VTR data, a primarily Northeast U.S. reporting system, an average of 213 vessels reported smooth dogfish landings per year between 2004 and 2007. Within the Coastal Fisheries Logbooks data, a primarily Southeast U.S. reporting system, an average of 10 vessels reported smooth dogfish landings per year between 2004 and 2007. From this data, an estimate of 223 vessels would require a smooth dogfish permit; however, as fishermen are currently not required to have a permit to retain smooth dogfish, this could be an underestimate of the number of fishermen that would require a federal commercial permit for smooth dogfish in the future.

Based on MRFSS data from 2004 to 2007, an average of 58,161 smooth dogfish were retained per year in the recreational fishery. This number is a proxy for the upper limit of participants in the federal recreational fishery that catches this species, but is likely lower because a single fisherman may have caught multiple smooth dogfish, and based on the life history of this species and the fact the most recreational fisherman are

shore-based, most smooth dogfish are likely caught in state waters, which would not require a federal HMS Angling category permit. Of those that fish in federal waters, the nominal fee of \$16.00 for a recreational HMS Angling category permit is not expected to create an impediment to entering or remaining in the recreational fishery.

Based on ACCSP data from 1998-2007, in the commercial fishery, an average of 950,859 lb dw of smooth dogfish were retained per year. Of this, 47,543 lb dw of fins would be available for sale (5 percent of dw for shark fins). Using the median ex-vessel price of these products between 2004 and 2007 (\$0.29 for smooth dogfish meat and \$2.02 for smooth dogfish fins), the fishery averaged \$371,786 in revenue per year.

Alternatives F2 a1, which would establish a smooth dogfish quota that is equal to the average annual landings from 1998-2007, and F2 a2, which would establish a smooth dogfish quota equal to the maximum annual landing between 1998-2007, could potentially have negative economic impacts on fishermen if the associated quotas reflect significant underreporting. If the actual landings are higher than these two quotas, fishermen would be prevented from fishing at status quo levels, which could result in negative economic impacts. Thus, NMFS does not prefer these two alternatives at this time.

Alternative F2 a3, which would establish a smooth dogfish quota above the maximum annual landings between 1998 and 2007, would have neutral economic impacts. The quota of maximum historical annual landings plus one standard deviation between the years 1998 and 2007 would allow a buffer for potential unreported landings during that time. This would allow the fishery to continue in the future without having to be shut down prematurely, which may not be warranted given smooth dogfish sharks have not been assessed. Thus, alternative F2 a3 is NMFS' preferred alternative at this time.

There are no negative economic impacts anticipated with alternative F2 b1. There is no charge associated with fishermen and researchers obtaining an EFP, SRP, display permit, or LOA for research or the collection for public display. In addition, NMFS would establish a smooth dogfish set-aside that would accommodate current and future research activities. Thus, NMFS does not anticipate any negative economic impacts associated with alternative F2 b1.

As with alternative F2 b1, there are no negative economic impacts anticipated with alternative F2 b2. There is no charge associated with fishermen and researchers obtaining an EFP, SRP, display permit, or LOA for research or for the collection for public display. In addition, NMFS would establish a smooth dogfish set-aside that would accommodate current and future research activities. Thus, NMFS does not anticipate any negative economic impacts associated with alternative F2 b1.

Alternative F3, which would implement management measures for smooth dogfish that complement the ASMFC plan, would likely have neutral to slightly positive socio-economic impacts. Most of the ASMFC regulations would not change the smooth

dogfish fishery, and therefore, would have neutral impacts on fishermen. In addition, the ASMFC's consideration of removing the two hour-net check provision and allowing fishermen to process smooth dogfish while at sea would allow fishermen to conduct the fishery as they have in the past, and therefore, result in neutral or slightly positive socio-economic impacts. However, since NMFS considers the requirements for gillnet checks and maintaining shark fins naturally attached through offloading necessary conservation tools for protected resources and to prevent shark finning, NMFS does not prefer this alternative at this time.

Chapter 6 References

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