

## 2. STATUS OF THE STOCKS

The thresholds used to determine the status of Atlantic HMS are presented in Figure 2.1. They are fully described in Chapter 3 of the 1999 Tunas, Swordfish, and Shark FMP (1999 FMP) and in Amendment 1 to the Billfish FMP. These thresholds were carried over in full in the 2006 Consolidated HMS FMP and are based upon the thresholds described in a paper providing the technical guidance for implementing NS 1 of the Magnuson-Stevens Act (Restrepo et al., 1998).

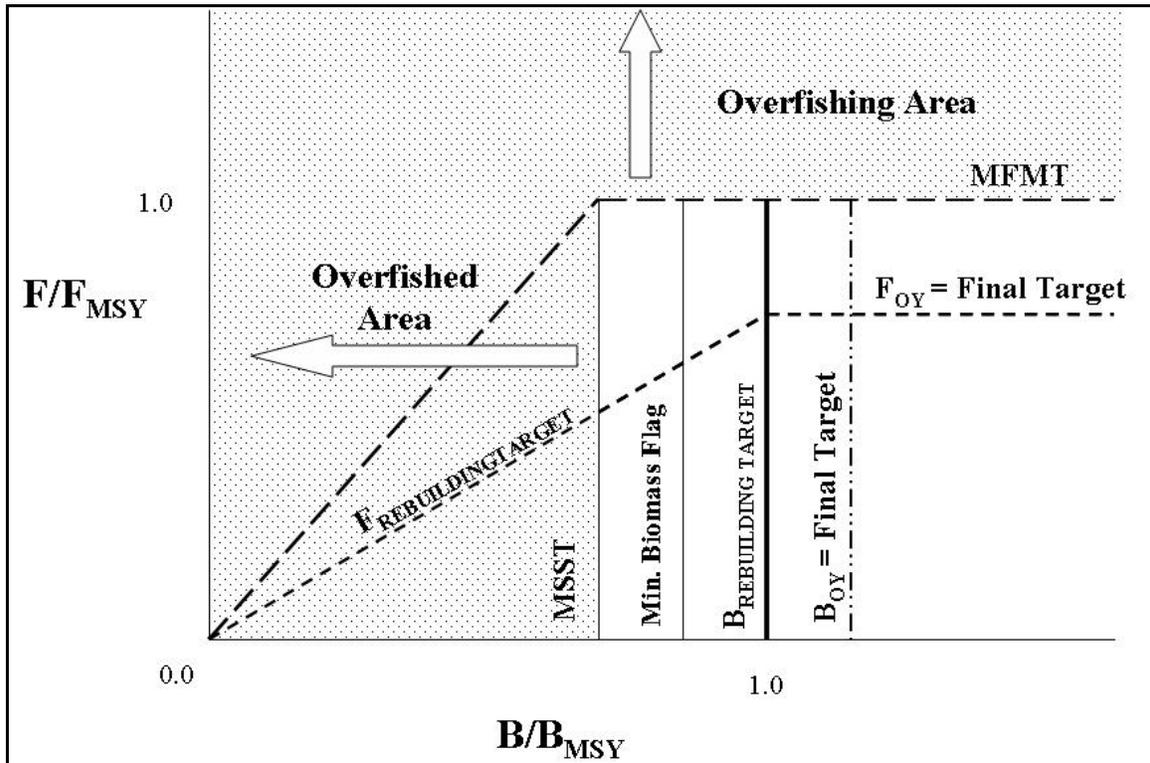


Figure 2.1 Illustration of the Status Determination Criteria and Rebuilding Terms

In summary, a species is considered overfished when the current biomass ( $B$ ) is less than the minimum stock size threshold ( $B < B_{MSST}$ ). The minimum stock size threshold ( $MSST$ ) is determined based on the natural mortality of the stock and the biomass at maximum sustainable yield ( $B_{MSY}$ ). Maximum sustainable yield ( $MSY$ ) is the maximum long-term average yield that can be produced by a stock on a continuing basis. The biomass can be lower than  $B_{MSY}$ , and the stock not be declared overfished as long as the biomass is above  $B_{MSST}$ . It is important to note that other bodies, such as ICCAT, use different thresholds for stock status determination. For instance, the ICCAT Convention defines an overfished status as  $B/B_{MSY} < 1.0$ , not  $B_{year}/B_{MSY} < MSST$ .

Overfishing may be occurring on a species if the current fishing mortality ( $F$ ) is greater than the fishing mortality at  $MSY$  ( $F_{MSY}$ ) ( $F > F_{MSY}$ ). In the case of  $F$ , the maximum fishing mortality threshold is  $F_{MSY}$ . Thus, if  $F$  exceeds  $F_{MSY}$ , the stock is experiencing overfishing. If a species is declared overfished or overfishing is occurring, action to rebuild the stock and/or prevent further overfishing is required by law. A species is considered rebuilt when  $B$  is greater than  $B_{MSY}$  and  $F$  is less than  $F_{MSY}$ . A species is considered healthy when  $B$  is greater than or

equal to the biomass at optimum yield ( $B_{OY}$ ) and  $F$  is less than or equal to the fishing mortality at optimum yield ( $F_{OY}$ ).

In summary, the thresholds used to calculate the status of Atlantic HMS, as described in the 1999 FMP and Amendment 1 to the Billfish FMP, are:

- Maximum Fishing Mortality Threshold (MFMT) =  $F_{limit} = F_{MSY}$ ;
- Overfishing is occurring when  $F_{year} > F_{MSY}$ ;
- Minimum Stock Size Threshold (MSST) =  $B_{limit} = (1-M)B_{MSY}$  when  $M < 0.5$ ; MSST =  $0.5B_{MSY}$  when  $M \geq 0.5$  (for billfish, the specific MSST values are: blue marlin =  $0.9B_{MSY}$ ; white marlin =  $0.85B_{MSY}$ ; west Atlantic sailfish =  $0.75B_{MSY}$ );  $M$  = natural mortality. In many cases an average  $M$  across age classes or sensitivity runs from a stock assessment model is used to calculate MSST.
- Overfished when  $B_{year}/B_{MSY} < MSST$ ;
- Biomass target during rebuilding =  $B_{MSY}$ ;
- Fishing mortality during rebuilding  $< F_{MSY}$ ;
- Fishing mortality for healthy stocks =  $0.75F_{MSY}$ ;
- Biomass for healthy stocks =  $B_{OY} = \sim 1.25$  to  $1.30B_{MSY}$ ;
- Minimum biomass flag =  $(1-M)B_{OY}$ ; and
- Level of certainty of *at least* 50 percent but depends on species and circumstances.
- For bluefin tuna, spawning stock biomass (SSB) is used as a proxy for biomass
- For sharks, in some cases, spawning stock fecundity (SSF) or number (N) can be used as a proxy for biomass since biomass does not influence pup production in sharks. SSF is the sum of the number mature sharks at age multiplied by pup-production at age.

With the exception of many Atlantic sharks stocks, stock assessments for Atlantic HMS are conducted by ICCAT's SCRS. In 2012, the SCRS completed stock assessments for Atlantic bluefin tuna and shortfin mako sharks. All SCRS final stock assessment reports can be found at <http://www.iccat.int/en/assess.htm>.

Atlantic shark stock assessments for large coastal sharks and small coastal sharks are generally completed by the Southeast Data, Assessment, and Review (SEDAR) process. A SEDAR assessment for Gulf of Mexico blacktip sharks was recently completed in May 2012. SEDAR assessments for sandbar, blacknose, and dusky sharks were recently completed in September 2011. In some cases, NMFS looks to available resources, including peer reviewed literature, for external assessments that, if deemed appropriate, could be used for domestic management purposes. NMFS followed this process in determining the stock status of scalloped hammerhead sharks based on an assessment for scalloped hammerhead sharks that was completed by Hayes et al. (2009). The results of all these assessments are shown below in Table 2.1.

Table 2.1 summarizes stock assessment information and the current status of Atlantic HMS as of November 2011. NMFS updates all U.S. fisheries stock statuses each quarter and provides a Status of U.S. Fisheries Report to Congress on an annual basis. The status of the stock reports are available at: <http://www.nmfs.noaa.gov/sfa/statusoffisheries/SOSmain.htm>.

Table 2.1 Stock Assessment Summary Table for Atlantic HMS

Species	Current Relative Biomass Level	B <sub>MSY</sub>	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Threshold	Outlook – From Status of Stocks for U.S.-Managed Species	Years to Rebuild	Rebuilding Start Date (Rebuilding End Date)
West Atlantic bluefin tuna	SSB <sub>11</sub> /SSB <sub>MSY</sub> * = 1.4 (1.14-1.72) (low recruitment)	12,943 mt (low recruitment; 12,717-13,268 mt)	0.86 SSB <sub>MSY</sub> (11,131 mt; low recruitment)	F <sub>08-10</sub> /F <sub>MSY</sub> ** = 0.61 (0.49-0.74) (low recruitment)	F <sub>MSY</sub> = 0.17 (0.14-0.19) (low recruitment)	*Low recruitment scenario: Not overfished; overfishing is not occurring.	20	5/1/1999 (2019)
	SSB <sub>11</sub> /SSB <sub>MSY</sub> * = 0.19 (0.13-0.29) (high recruitment)	93,621 mt (high recruitment; 77,288-116,679 mt)	(80,514 mt; high recruitment)	F <sub>08-10</sub> /F <sub>MSY</sub> ** = 1.57 (1.24-1.95) (high recruitment)	F <sub>MSY</sub> = 0.064 (0.056-0.074) (high recruitment)	*High recruitment scenario: Overfished; overfishing is occurring		
*Future stock productivity is based upon two hypotheses about future recruitment: a "high recruitment scenario" in which future recruitment has the potential to achieve levels that occurred in the early 1970s and a "low recruitment scenario" in which future recruitment is expected to remain near present levels. The SCRS, as stated in the stock assessment, has no strong evidence to favor either scenario over the other and notes that both are reasonable (but not extreme) lower and upper bounds on rebuilding potential.								
Atlantic bigeye tuna	B <sub>09</sub> /B <sub>MSY</sub> = 1.01 (0.72-1.34)	422,630 mt	0.6 B <sub>MSY</sub> (253,578 mt)	F <sub>09</sub> /F <sub>MSY</sub> = 0.95 (0.65-1.55)	F <sub>MSY</sub> = 0.17	Not overfished (Rebuilding); overfishing not occurring.	Not available††	1/1/1999
Atlantic yellowfin tuna	B <sub>10</sub> /B <sub>MSY</sub> = 0.85 (0.61-1.12)	<i>Unknown</i>	0.5 B <sub>MSY</sub> (age 2+)	F <sub>current</sub> /F <sub>MSY</sub> = 0.87 (0.68-1.40)	F <sub>MSY</sub>	Not overfished; overfishing not occurring.		
North Atlantic albacore tuna	B <sub>07</sub> /B <sub>MSY</sub> = 0.62 (0.45-0.79)	B <sub>MSY</sub> = 172,000 mt SSB <sub>MSY</sub> = 58,170 mt	0.7 B <sub>MSY</sub> (120,400 mt; based on B <sub>MSY</sub> ) (40,719 mt; based on SSB <sub>MSY</sub> )	F <sub>07</sub> /F <sub>MSY</sub> = 1.05 (0.85-1.23)	F <sub>MSY</sub> = 0.17	Overfished; overfishing is occurring.	Not Available††	1/1/1999

Species	Current Relative Biomass Level	B <sub>MSY</sub>	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Threshold	Outlook – From Status of Stocks for U.S.-Managed Species	Years to Rebuild	Rebuilding Start Date (Rebuilding End Date)
West Atlantic skipjack tuna	B <sub>08</sub> /B <sub>MSY</sub> : most likely >1	Unknown	Unknown	F <sub>08</sub> /F <sub>MSY</sub> : most likely <1	F <sub>MSY</sub>	Unknown		
North Atlantic swordfish	B <sub>09</sub> /B <sub>MSY</sub> = 1.05 (0.94-1.24)	61,860 mt	0.8 B <sub>MSY</sub> ; (49,488 mt)	F <sub>08</sub> /F <sub>MSY</sub> = 0.76 (0.67-0.96)	F <sub>MSY</sub> = 0.22 (0.14-0.27)	Not overfished; overfishing not occurring		
South Atlantic swordfish	B <sub>09</sub> /B <sub>MSY</sub> = 1.04 (0.82-1.22)	47,700 mt	0.8 B <sub>MSY</sub> (38,160 mt)	F <sub>08</sub> /F <sub>MSY</sub> = 0.75 (0.60-1.01)	F <sub>MSY</sub> = 0.31	Unknown		
Blue marlin	B <sub>09</sub> /B <sub>MSY</sub> = 0.67 (0.53-0.81)	25,411 mt (SSB <sub>MSY</sub> )	0.9 B <sub>MSY</sub> (22,870 mt; based on SSB <sub>MSY</sub> )	F <sub>09</sub> /F <sub>MSY</sub> = 1.63 (1.11-2.16)	F <sub>MSY</sub> = 0.07	Overfished; overfishing is occurring	Not available††	6/1/2001
White marlin (and roundscale spearfish)	B <sub>2010</sub> /B <sub>MSY</sub> = 0.5 (0.42-0.60)	29,240 mt (27,260-30,720 mt)	0.85 B <sub>MSY</sub> (23,171-26,112 mt)	F <sub>2010</sub> /F <sub>MSY</sub> = 0.99 (0.75-1.27; low productivity) F <sub>2010</sub> /F <sub>MSY</sub> = 0.72 (0.51-0.93; high productivity)	F <sub>MSY</sub> = 0.03 (0.027-0.035)	Overfished; overfishing may not be occurring	Not available††	6/1/2001
West Atlantic sailfish	B <sub>07</sub> <B <sub>MSY</sub> : Possibly	Unknown	0.78 B <sub>MSY</sub> Unknown	F <sub>07</sub> >F <sub>MSY</sub> : Possibly	Unknown	Overfished; overfishing is occurring	Not available††	1/1/1999
Longbill spearfish	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown		
Large coastal shark complex	Unknown	Unknown	(1-M) B <sub>MSY</sub>	Unknown	Unknown	Unknown		
Sandbar	SSF <sub>09</sub> /SSF <sub>MSY</sub> = 0.51 – 0.72	SSF <sub>MSY</sub> = 349,330-1,377,800 (numbers of sharks)	301,821 – 1,190,419 (based on SSF <sub>MSY</sub> )	F <sub>09</sub> /F <sub>MSY</sub> = 0.29-2.62	0.004-0.06	Overfished; overfishing is not occurring	66	1/1/2005 (2070)

Species	Current Relative Biomass Level	B <sub>MSY</sub>	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Threshold	Outlook – From Status of Stocks for U.S.-Managed Species	Years to Rebuild	Rebuilding Start Date (Rebuilding End Date)
Gulf of Mexico blacktip	SSF <sub>2010</sub> /SSF <sub>MSY</sub> = 2.00-2.66	SSF <sub>MSY</sub> = 1,570,000 - 6,440,000 (numbers of sharks)	1,328,220 - 5,448,240 (based on SSF <sub>MSY</sub> )	F <sub>2010</sub> /F <sub>MSY</sub> = 0.05–0.27	0.021-0.163	Not overfished; overfishing not occurring		
Atlantic blacktip	<i>Unknown</i>	<i>Unknown</i>	(1-M) B <sub>MSY</sub>	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>		
Dusky sharks	SSB <sub>09</sub> /SSB <sub>MSY</sub> = 0.41-0.50	<i>Unknown</i>	(1-M) B <sub>MSY</sub>	F <sub>09</sub> /F <sub>MSY</sub> = 1.39-4.35	0.01-0.05	Overfished; overfishing is occurring	100	7/24/2008 (2108)
Scalloped hammerhead sharks	N <sub>05</sub> /N <sub>MSY</sub> = 1.29	N <sub>MSY</sub> = 62,000 (numbers of sharks)	(1-M) B <sub>MSY</sub>	F <sub>05</sub> /F <sub>MSY</sub> = 0.45	0.11	Overfished; overfishing is occurring	Under Development	
Small coastal shark complex	N <sub>05</sub> /N <sub>MSY</sub> = 1.69	N <sub>MSY</sub> = 30,000,000 (numbers of sharks)	21,000,000 (based on N <sub>MSY</sub> )	F <sub>05</sub> /F <sub>MSY</sub> = 0.25	0.09	Not overfished; overfishing not occurring		
Bonnethead sharks	SSF <sub>05</sub> /SSF <sub>MSY</sub> = 1.13	SSF <sub>MSY</sub> = 1,990,000 (numbers of sharks)	1,400,000 (based on SSF <sub>MSY</sub> )	F <sub>05</sub> /F <sub>MSY</sub> = 0.6	0.31	Not overfished; overfishing not occurring		
Atlantic sharpnose sharks	SSF <sub>05</sub> /SSF <sub>MSY</sub> = 1.47	SSF <sub>MSY</sub> = 4,590,000 (numbers of sharks)	4,090,000 (based on SSF <sub>MSY</sub> )	F <sub>05</sub> /F <sub>MSY</sub> = 0.74	0.19	Not overfished; overfishing not occurring		
Atlantic blacknose sharks	SSF <sub>09</sub> /SSF <sub>MSY</sub> = 0.43 – 0.64	SSF <sub>MSY</sub> = 77,577-288,360 (numbers of sharks)	62,294-231,553 (based on SSF <sub>MSY</sub> )	F <sub>09</sub> /F <sub>MSY</sub> = 3.26 – 22.53	0.01-0.15	Overfished; overfishing is occurring	Under Development	
Gulf of Mexico blacknose sharks	<i>Unknown</i>	<i>Unknown</i>	(1-M) B <sub>MSY</sub>	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>		
Finetooth sharks	N <sub>05</sub> /N <sub>MSY</sub> = 1.80	N <sub>MSY</sub> = 3,200,000 (numbers of sharks)	2,400,000 (based on N <sub>MSY</sub> )	F <sub>05</sub> /F <sub>MSY</sub> = 0.17	0.03	Not overfished; overfishing not occurring		

Species	Current Relative Biomass Level	B <sub>MSY</sub>	Minimum Stock Size Threshold	Current Relative Fishing Mortality Rate	Maximum Fishing Mortality Threshold	Outlook – From Status of Stocks for U.S.-Managed Species	Years to Rebuild	Rebuilding Start Date (Rebuilding End Date)
Northwest Atlantic porbeagle sharks	B <sub>08</sub> /B <sub>MSY</sub> = 0.43 – 0.65	29,382-40,676 mt	(1-M) B <sub>MSY</sub>	F <sub>08</sub> /F <sub>MSY</sub> = 0.03 – 0.36	0.025-0.075	Overfished; overfishing not occurring	100	7/24/2008 (2108)
North Atlantic blue sharks	B <sub>07</sub> /B <sub>MSY</sub> = 1.87 - 2.74	<i>Unknown</i>	(1-M) B <sub>MSY</sub>	F <sub>07</sub> /F <sub>MSY</sub> = 0.13-0.17	0.15	Not overfished; overfishing not occurring		
North Atlantic shortfin mako sharks	B <sub>2010</sub> /B <sub>MSY</sub> = 1.15 - 2.04	183,612 mt - 863,655 mt†	(1-M) B <sub>MSY</sub>	F <sub>2010</sub> /F <sub>MSY</sub> = 0.16-0.92	0.029-0.104†	Not overfished; overfishing not occurring		
Pelagic sharks	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>	<i>Unknown</i>		

\*Note: The Species Information System (SIS), which informs the Status of the Stocks Report, allows only one status determination per stock. Therefore, a joint distribution was calculated, assuming equal plausibility of the high and low recruitment scenarios for West Atlantic bluefin tuna. F<sub>current</sub> refers to the geometric mean of the estimates for 2008-2010 (a proxy for recent F levels). The median and the 10th and 90th percentiles of the joint distribution are as follows: SSB<sub>2011</sub>/SSB<sub>MSY</sub>: 0.64 (0.15-1.63); F<sub>current</sub>/F<sub>MSY</sub>: 0.95 (0.53-1.81); SSB<sub>MSY</sub>: 37,970 (12,780-108,520); F<sub>MSY</sub>: 0.12 (0.06-0.18). \*\*Where F year refers to the geometric mean of the estimates for 2008-2010 (a proxy for recent F levels). †Only the BSP model provided B<sub>MSY</sub> values. The B<sub>MSY</sub> range encompasses the 16 scenarios run of the BSP model. Both the BSP and catch-free model estimated F<sub>MSY</sub>. The F<sub>MSY</sub> range encompasses the lowest estimate of the 16 scenarios run of the BSP model and the highest estimate of the 10 scenarios run for the catch-free model. ††There is insufficient information to estimate how many years it will take this stock to rebuild.

Sources: SCRS, 2007, 2008, 2009a, 2009b, 2010, 2011, 2012a, 2012b; Gibson and Campana, 2005; Cortés et al., 2006; NMFS, 2006; NMFS, 2007; Hayes et al., 2009; SEDAR 2011a, 2011b, 2011c, 2011d.

## 2.1 Stock Assessment Details

The 2012 SCRS report (i.e., the summary report) is available online at:  
[http://www.iccat.int/Documents/Meetings/SCRS2012/2012\\_SCRS\\_REP\\_EN.pdf](http://www.iccat.int/Documents/Meetings/SCRS2012/2012_SCRS_REP_EN.pdf)

Detailed stock assessments for the species in Table 2.1 are available at these websites:

### *Western Atlantic Bluefin Tuna*

Assessed by ICCAT's SCRS in 2012:

[http://www.iccat.int/Documents/Meetings/Docs/2012\\_BFT\\_ASSESS.pdf](http://www.iccat.int/Documents/Meetings/Docs/2012_BFT_ASSESS.pdf)

### *Atlantic Bigeye Tuna*

Assessed by ICCAT's SCRS in 2010:

[http://www.iccat.int/Documents/Meetings/Docs/2010\\_BET\\_Assessment\\_REP\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2010_BET_Assessment_REP_ENG.pdf)

### *Atlantic Yellowfin Tuna*

Assessed by ICCAT's SCRS in 2011:

[http://www.iccat.int/Documents/Meetings/Docs/2011\\_YFT\\_ASSESS\\_REP.pdf](http://www.iccat.int/Documents/Meetings/Docs/2011_YFT_ASSESS_REP.pdf)

### *North Atlantic Albacore Tuna*

Assessed by ICCAT's SCRS in 2009:

<http://www.iccat.int/Documents/SCRS/DetRep/DET-ALB-NA.pdf>

### *West Atlantic Skipjack Tuna*

Assessed by ICCAT's SCRS in 2008:

<http://www.iccat.int/Documents/SCRS/DetRep/DET-YFT-SKJ.pdf>

### *North Atlantic Swordfish*

Assessed by ICCAT's SCRS in 2009:

[http://www.iccat.int/Documents/Meetings/Docs/2009\\_SWO\\_ASSESS\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2009_SWO_ASSESS_ENG.pdf)

### *South Atlantic Swordfish*

Assessed by ICCAT's SCRS in 2009:

[http://www.iccat.int/Documents/Meetings/Docs/2009\\_SWO\\_ASSESS\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2009_SWO_ASSESS_ENG.pdf)

### *Blue Marlin*

Assessed by ICCAT's SCRS in 2011:

[http://www.iccat.int/Documents/Meetings/Docs/2011 BUM\\_ASSESS\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2011 BUM_ASSESS_ENG.pdf)

### *White Marlin and Roundscale Spearfish*

Assessed by ICCAT's SCRS in 2012:

[http://www.iccat.int/Documents/Meetings/Docs/2012 WHM\\_ASSESS\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2012 WHM_ASSESS_ENG.pdf)

*West Atlantic Sailfish*

Assessed by ICCAT's SCRS in 2009:

[http://www.iccat.int/Documents/Meetings/Docs/2009\\_SAI\\_ASSESS\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2009_SAI_ASSESS_ENG.pdf)

*Longbill Spearfish*

Longbill spearfish have not been individually assessed by ICCAT's SCRS due to the paucity of data. Some information can be found in the 2001 sailfish stock assessment:

[http://www.iccat.int/Documents/SCRS/DetRep/DET\\_sai.pdf](http://www.iccat.int/Documents/SCRS/DetRep/DET_sai.pdf)

*Large Coastal Shark (LCS) Complex*

Assessed in 2006 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=11](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=11)

*Sandbar Sharks*

Assessed in 2010/2011 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=21](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=21)

*Gulf of Mexico Blacktip Sharks*

Assessed in 2012 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=29](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=29)

*Atlantic Blacktip Sharks*

Assessed in 2006 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=11](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=11)

*Dusky Sharks*

Assessed in 2010/2011 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=21](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=21)

*Small Coastal Shark (SCS) Complex*

Assessed in 2007 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=13](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13)

*Bonnethead Sharks*

Assessed in 2007 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=13](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13)

*Atlantic Sharpnose Sharks*

Assessed in 2007 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=13](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13)

*Blacknose Sharks (Atlantic and Gulf of Mexico)*

Assessed in 2010/2011 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=21](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=21)

*Finetooth Sharks*

Assessed in 2007 through the SEDAR process:

[http://www.sefsc.noaa.gov/sedar/Sedar\\_Workshops.jsp?WorkshopNum=13](http://www.sefsc.noaa.gov/sedar/Sedar_Workshops.jsp?WorkshopNum=13)

*Northwest Atlantic Porbeagle Sharks*

Assessed by ICCAT's SCRS in 2009:

[http://www.iccat.int/Documents/Meetings/Docs/2009\\_POR\\_ASSESS\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2009_POR_ASSESS_ENG.pdf)

*North Atlantic Blue Sharks*

Assessed by ICCAT's SCRS in 2008:

[http://www.iccat.int/Documents/Meetings/Docs/2008\\_SHK\\_Report.pdf](http://www.iccat.int/Documents/Meetings/Docs/2008_SHK_Report.pdf)

*North Atlantic Shortfin Mako Sharks*

Assessed by ICCAT's SCRS in 2008:

[http://www.iccat.int/Documents/Meetings/Docs/2012\\_SHK\\_ASS\\_ENG.pdf](http://www.iccat.int/Documents/Meetings/Docs/2012_SHK_ASS_ENG.pdf)

*Scalloped Hammerhead Sharks*

Assessed in Hayes et al. (2009).

## Chapter 2 References

Cortés, E., P. Brooks, P. Apostolaki, and C.A. Brown. 2006. Stock assessment of dusky shark in the U.S. Atlantic and Gulf of Mexico. NMFS Panama City Laboratory, Sustainable Fisheries Division Contribution SFD-2006-014, pp.15.

Gibson, A.J.A. and S.E. Campana. 2005. Status and recovery potential of porbeagle shark in the Northwest Atlantic. Canadian Science Advisory Secretariat, Research Document 2005/053. 79 pp. <http://www.dfo-mpo.gc.ca/csas/>

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

NMFS. 2006. SEDAR 11 Stock assessment report: large coastal shark complex, blacktip and sandbar shark. Highly Migratory Species Management Division, 1315 East-West Highway, Silver Spring, MD 20910. 257 pp.

NMFS. 2007. SEDAR 13 Stock assessment report: small coastal sharks, Atlantic sharpnose, blacknose, bonnethead, and finetooth shark. Highly Migratory Species Management Division, 1315 East-West Highway, Silver Spring, MD 20910. 375 pp.

- Restrepo, V.R., G.G. Thompson, P.M. Mace, W.L. Gabriel, L.L. Low, A.D. MacCall, D. Methot, J.E. Powers, B.L. Taylor, P.R. Wade, and J.F. Witzig, 1998. Technical guidance on the use of precautionary approaches to implementing National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act. NOAA Tech Memo NMFS-S/SPO. 54 pp.
- SCRS. 2007. Report of the standing committee on research and statistics. ICCAT SCRS. Madrid, Spain, October 1-5, 2007. 216 pp.
- SCRS. 2008. Report of the standing committee on research and statistics. ICCAT SCRS. Madrid, Spain, September 29-October 3, 2008. 241 pp.
- SCRS. 2009a. Report of the standing committee on research and statistics. ICCAT SCRS. Madrid, Spain, October 5-9, 2009. 273 pp.
- SCRS. 2009b. Report of the 2009 porbeagle stock assessment meeting. ICCAT SCRS. Copenhagen, Denmark, June 22-27, 2009. 42 pp.
- SCRS. 2010. Report of the standing committee on research and statistics. ICCAT SCRS. Madrid, Spain, October 4-8, 2010. 270 pp.
- SCRS. 2011. Report of the standing committee on research and statistics. ICCAT SCRS. Madrid, Spain, October 3-7, 2011. 267 pp.
- SCRS. 2012a. Report of the standing committee on research and statistics. ICCAT SCRS. Madrid, Spain, October 1-5, 2012. 303 pp.
- SCRS. 2012b. Report of the 2012 Sharks meeting to apply ecological risk analysis and shortfin mako assessment (Olhao, Portugal - June 11-18, 2012). SCRS/2012/013.
- SEDAR. 2011a. SEDAR 21 complete stock assessment report: HMS Atlantic blacknose shark. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 438 pp.
- SEDAR. 2011b. SEDAR 21 complete stock assessment report: HMS dusky sharks. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 414 pp.
- SEDAR. 2011c. SEDAR 21 complete stock assessment report: HMS Gulf of Mexico blacknose shark. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 415 pp.
- SEDAR. 2011d. SEDAR 21 complete stock assessment report: HMS sandbar shark. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 459 pp.
- SEDAR, 2012. SEDAR 29 stock assessment report: HMS Gulf of Mexico blacknose sharks. SEDAR, 4055 Faber Place Drive, Suite 201, North Charleston, SC 29405. 415p.