



## Mid-Atlantic Fishery Management Council

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# MEMORANDUM

**DATE:** September 12, 2013

**TO:** Chris Moore, Executive Director

**FROM:** Jim Armstrong

**SUBJECT: Spiny Dogfish ABC and Management Measures for 2014**

### Summary

The existing spiny dogfish specifications established management measures for the 2013 - 2015 fishing years. Management measures for the upcoming 2014 fishing year may remain unchanged if the previously recommended ABC for 2014 (25,154 mt) is determined by the SSC to still be appropriate following review of an updated assessment. The 2013 assessment update (Attachment A) indicates that, as in the 2012 update, the spiny dogfish stock is not overfished and overfishing is not occurring. The estimate of mature female biomass (211,372 mt) for 2013 is 133 % of  $B_{MSY}$  (159,288 mt) and realized  $F$  for 2012 (0.149) is approximately 61% of  $F_{MSY}$  (0.2439).

The staff recommendation is to maintain the specified ABC = 25,154 mt as the basis for management measures in 2014. ABC for 2014 was derived by applying constant  $F = 0.19528$  in harvest projections where  $F=0.19528$  corresponded to the  $P^*$ -based ABC for 2013 given  $OFL = 30,652$  mt and  $B_{2012}/B_{MSY} > 1$ . Application of the  $P^*$  algorithm for 2014, based on updated OFL (32,210 mt) generates ABC = 26,085 mt, a 3.7% increase from the specified ABC suggesting that the ABC specified for 2014 may be risk averse.

In accordance with the Council's Omnibus ACL/AM Amendment, for spiny dogfish, a *domestic* ABC is set equal to total ABC minus Canadian landings and ACL = domestic ABC. A value of 81 mt Canadian landings (ave 2009-2011) was used to calculate the domestic ABC / ACL for 2014, and the updated Canadian landings are 65 mt (ave 2010-2012). The ACT for 2014 (24,174 mt) was reduced from ACL based on observed quota overages of about 4.5% from 2010-2011. Updated landings show an average underharvest of 4.5% since 2010 which could offset a deduction for management uncertainty. Similar updates such as estimated discards (5,306 mt specified, updated to 5,264 mt) and U.S. recreational landings (26.5 mt specified, updated to 24.0 mt) could be set lower than originally specified.

Multi-year management measures were established in 2012 because stock conditions permitted and because the stability provided by multi-year management measures benefits stakeholders. Current market conditions suggest that the fishery would be unable to accommodate the potential increases in the commercial quota, and as such, maintaining the specified measures for 2014 will not reduce fishing opportunity.

## **Introduction**

The specification of spiny dogfish management measures is a joint process conducted by the Mid-Atlantic and New England Fishery Management Councils (Councils). A separate specification process is also undertaken by the Atlantic States Marine Fisheries Commission's Spiny Dogfish Management Board (Board). The Northeast Fishery Science Center (Center) annually updates the spiny dogfish assessment and conducts long-term projections. The Mid-Atlantic Council's Scientific and Statistical Committee (SSC) reviews assessment results and determines the acceptable biological catch (ABC) for the upcoming year or reviews previous ABC determinations within a multi-year specification period (up to five years). The Councils' Spiny Dogfish Monitoring Committee (MC) develops and recommends specific coastwide (Maine – Florida) management measures, including a commercial quota and trip limit, and makes further adjustments to total catch as needed based on management uncertainty. Finally, the Councils, at their respective meetings, develop recommendations to be submitted to the National Marine Fisheries Service.

In this memorandum, information is presented to assist the SSC and MC in their roles in the specification process for 2014. The existing spiny dogfish specifications established management measures for the current 2013 as well as the upcoming 2014 - 2015 fishing years. Specified management measures may remain unchanged if the previously recommended ABC for 2014 (25,154 mt) is determined by the SSC to still be appropriate following review of the updated assessment. Assessment update results are presented briefly herein and a detailed Stock Status Report prepared by the Center is attached under separate cover. That and other listed documents are distributed in conjunction with this staff memo:

Attachment A: Stock Status Report (NEFSC 2013)

Attachment B: SSC Report from 2012

Attachment C: Fishery Performance Report

## **Management History**

A long term landings history (1962-2012) is provided in Table 1 of Attachment A. The federal FMP was developed in 1998 and implemented in 2000 in order to halt large scale depletion of reproductively mature female spiny dogfish and allow the stock to recover to a sustainable level. The directed dogfish fishery of the 1990s harvested primarily the largest (80+ cm) spiny dogfish in the stock, and the species' life history is such that these fish are primarily mature females. The FMP eliminated the directed fishery for spiny dogfish beginning in 2000 by instituting a 4 million pound (1,814 mt) commercial quota that essentially served as a bycatch allowance. Substantial increases in SSB followed and an increase in the commercial quota to 12 million pounds (5,443 mt) in 2009 was possible while continuing to achieve  $F_{rebuild}$ . The stock was declared rebuilt in 2010 and commercial quotas have increased markedly since then (15 M lb in 2010; 20 M lb in 2011; 36 M lb in 2012, and ~41 M lb in 2013-2015).

## **Regulatory Review (Current Management Measures)**

For the current 2013-2015 fishing years (Table 1), the SSC recommended ABC based on  $F = 0.19528$  which was the fishing mortality rate that corresponded to  $P^*$ -based ABC in 2013 (Attachment B). Constant  $F$  was applied to projections and provided ABC for 2014 and 2015 as well. The SSC chose to limit multi-year ABC to three years, ending in 2015, because projected biomass showed a decline beginning in 2016 as the low 1997-2003 year classes recruited into the exploitable stock.

Based on recommendations from the spiny dogfish monitoring committee for 2013, the Council adopted a commercial quota of 40.842 M lbs (18,526 mt) and trip limits of 4,000 lbs. The commercial quota accommodated a reduction from ABC to allow for average discards (5,306 mt) as well as recreational landings (26 mt) taken from the 2012 assessment update (Table 1).

**Table1. Derivation of spiny dogfish quotas for 2013 through 2015.**

2013 Measures		Basis	M lb	MT
OFL		$F_{MSY} (0.2439)$	67.576	30,652
ABC		$Constant F (0.19528)$	54.474	24,709
Canadian Landings		= ave 2009-2011	0.179	81
Domestic ABC		= ABC – Canadian Landings	54.295	24,628
ACL		= Domestic ABC	54.295	24,628
Mgmt Uncertainty Buffer		Ave of quota overages (pct) in 2010-2011 (4.0%)	1.697	770
ACT		= Domestic ACL – management uncertainty	52.598	23,858
U.S. Discards		= ave 2002-2011	11.698	5,306
TAL		ACT – Discards	40.900	18,552
U.S. Rec Landings		= ave 2010-2011	0.058	26
Comm Quota		TAL – Rec Landings	40.841896	18,526

2014 Measures		Basis	M lb	MT
OFL				
ABC		$Constant F (0.19528)$	55.455	25,154
Canadian Landings		= ave 2009-2011	0.179	81
Domestic ABC		= ABC – Canadian Landings	55.277	25,073
ACL		= Domestic ABC	55.277	25,073
Mgmt Uncertainty Buffer		Ave of quota overages (pct) in 2010-2011 (4.0%)	1.737	788
ACT		= Domestic ACL – management uncertainty	53.540	24,285
U.S. Discards		= ave 2002-2011	11.698	5,306
TAL		ACT – Discards	41.842	18,979
U.S. Rec Landings		= ave 2010-2011	0.058	26
Comm Quota		TAL – Rec Landings	41.783807	18,953

2015 Measures		Basis	M lb	MT
OFL				
ABC		$Constant F (0.19528)$	55.241	25,057
Canadian Landings		= ave 2009-2011	0.179	81
Domestic ABC		= ABC - Canadian Landings	55.063	24,976
ACL		= Domestic ABC	55.063	24,976
Mgmt Uncertainty Buffer		Ave of quota overages (pct) in 2010-2011 (4.0%)	1.728	784
ACT		= Domestic ACL - management uncertainty	53.335	24,192
U.S. Discards		= ave 2002-2011	11.698	5,306
TAL		ACT - Discards	41.637	18,886
U.S. Rec Landings		= ave 2010-2011	0.058	26
Comm Quota		TAL - Rec Landings	41.578491	18,860

## **Biological Reference Points**

The  $B_{MSY}$  proxy for spiny dogfish is "spawning" stock biomass ( $SSB_{MAX}$ ), which is estimated to be 159,288 mt (351,170 M lb), and the level at which the stock is determined to be overfished ( $\frac{1}{2} B_{MSY}$ ) is 79,644 mt (175,585 M lb). The  $B_{MSY}$  proxy was reviewed and accepted by TRAC reviewers in 2010 and is described in Rago and Sosebee (2010).

Overfishing occurs when fishing mortality is above the  $F_{MSY}$  proxy which is estimated to be 0.2439. The current  $F_{MSY}$  proxy was accepted for use as a basis for OFL by an SSC working group in August, 2011.

### **Stock Biomass**

*The spiny dogfish stock is not overfished.* The updated stochastic estimate of female spawning stock biomass (SSB) for 2013 (211,372 mt) is about 33% above the  $SSB_{max}$  biomass target (159,288 mt). This is the sixth consecutive year in which the SSB estimate has been above  $SSB_{max}$ . The probability that the  $SSB_{2013}$  is below  $SSB_{max}$  is estimated to be less than 25%. The probability that  $SSB_{2013}$  is above the biomass threshold (79,644 mt, i.e.,  $1/2 SSB_{max}$ ) is estimated to be 98%.

Uncertainty in the biomass estimate is accounted for in the underlying variability in the spring trawl survey data as well as uncertainty in the size of the footprint of the average trawl tow. Uncertainty in the Ricker S-R based biomass reference point is accounted for in the confidence interval associated with model fit.

### **Fishing Mortality**

Several sources of removals contribute to the estimate of F for the most recent complete fishing year (2012). These include U.S. commercial landings (10,660 mt), Canadian commercial landings (65 mt), Distant Water Fleet landings (137 mt), U.S. commercial discards (4,848 mt), and U.S. recreational landings (19 mt). Total removals in 2012 were approximately 15,729 mt corresponding to a stochastic F estimate of  $F_{2012} = 0.149$ , below the overfishing threshold of  $F = 0.2439$  and. The probability that *overfishing is not occurring* ( $F_{2012} < F_{threshold}$ ) is approximately 91%.

Uncertainty is quantified in model estimates of F and is based on uncertainty in biomass as well as the variance associated with discard estimates, sex ratio, size composition, selectivity and other parameters (Attachment A). Uncertainty in the fishing mortality reference point corresponding to OFL is also estimated (Attachment A).

### **Other Sources of Uncertainty**

Because spiny dogfish biomass estimates are primarily based on catches in the Center's spring trawl survey, an important source of uncertainty is the calibration between the R/V Albatross and FSV Bigelow. The efficiency of the RV Albatross net is estimated to be approximately 64% that of the FSV Bigelow.

Other important sources of scientific uncertainty:

- Canadian landings
- Changes in selectivity

- Discards
- Scaling with landings
- Fate of discarded fish
- Scale of population—Q
- Sex ratios of landings
- Male dogfish

## **Specification of 2014 ABC and Management Measures**

ABC, ACL, ACT, and the commercial quota and trip limit for 2014 were established as part of three year (2013-2015) specifications. Those measures will remain in place unless ABC is determined by the SSC to no longer be appropriate or if the Council chooses to modify any of the measures. Based on the assessment update, ABC and other management measures could be modified to allow for greater available yield than currently specified. Potential adjustments to the specified values for 2014 are provided in Table 2. The adjusted commercial quota could be increased by as much as 9.2% if ABC is adjusted and 4.5% if ABC is not adjusted. Although these adjustments would accommodate larger potential landings, the fishery has underperformed recently and so the currently specified measures are not expected to constrain harvest or reduce fishing opportunity in 2014.

**Table2. Derivation of spiny dogfish quotas for 2014.**

(Existing)					
2014 Measures	Basis	M lb	mt	ABC Update (mt)	No ABC Update (mt)
OFL				32,210	
ABC	<i>Constant F (0.19528)</i>	55.455	25,154	26,085*	25,154
Canadian Landings	= ave 2009-2011	0.179	81	65	65
Domestic ABC	= ABC – Canadian Landings	55.277	25,073	26,020	25,089
ACL	= Domestic ABC	55.277	25,073	26,020	25,089
Mgmt Uncertainty Buffer	<i>Ave of quota overages (pct) in 2010-2011 (4.0%)</i>	1.737	788	0	0
ACT	= Domestic ACL – management uncertainty	53.540	24,285	26,020	25,089
U.S. Discards	= ave 2002-2011	11.698	5,306	5264	5264
TAL	<i>ACT – Discards</i>	41.842	18,979	20,756	19,825
U.S. Rec Landings	= ave 2010-2011	0.058	26	24	24
Comm Quota	<i>TAL – Rec Landings</i>	41.783807	18,953	20,732	19,801

\* The updated ABC is based on the Council's risk policy for a level 3 assessment.

### **ABC**

ABC for 2014 (25,154 mt) was developed as part of a multi-year ABC determination made by the SSC in 2012 and the value for ABC was derived by applying constant  $F = 0.19528$  to long term spiny dogfish projections. The value  $F=0.19528$  corresponded to  $P^*$ -based ABC for 2013 given OFL = 30,652 mt and  $B_{2012}/B_{MSY} > 1$ . The biomass estimate for 2013 (211,372 mt) represents a small decline from 2012 biomass (217,744 mt), however, the estimate remains more than 30% above  $B_{MSY}$ . Application of the risk policy algorithm for 2014 based on updated OFL (32,210 mt) and  $B_{2013}/B_{MSY} > 1$  generates ABC = 26,085 mt, a 3.7% increase from the specified ABC (25,154 mt) suggesting that ABC could be increased and that the existing 2014 ABC may be risk averse.

### **ACL**

According to the FMP, a reduction from ABC to accommodate Canadian landings is made to derive domestic ABC which is defined as equal to the ACL. For 2014, the specified deduction for Canadian

landings is 81 mt (ave 2009-2011) resulting in domestic ABC (i.e., ACL) = 25,073 mt (Table 1). Canadian landings from the updated assessment are 65 mt (ave 2009-2012) which suggests that ACL could be increased to as much as 26,020 mt if ABC is adjusted or 25,089 mt if ABC is not adjusted.

## ACT

The Annual Catch Target (ACT) accounts for management uncertainty, and for 2014, the ACT (24,174 mt) was reduced from ACL based on observed quota overages of about 4% from 2010-2011. Updated landings show an average underharvest of 4% since 2010 which could offset a deduction for management uncertainty. Because of the underharvest, the existing deduction from the domestic ACL (1,001 mt; 2.208 M lb) may be thought of as resulting in foregone yield.

**Table 3. Summary of spiny dogfish landings relative to the quota(s) for 2000 - 2012.**

Fishing year (May 1 - Apr 30)	Quota (M lb)		Landings (M lb)
	Federal	States'	
2000	4.0	n/a	8.2
2001	4.0	n/a	5.1
2002	4.0	n/a	4.8
2003	4.0	8.8	3.2
2004	4.0	4.0	1.5
2005	4.0	4.0	2.6
2006	4.0	6.0	6.6
2007	4.0	6.0	6.5
2008	4.0	8.0	9.0
2009	12.0	12.0	11.8
2010	15.0	14.4	14.5
2011	20.0	19.5	22.5
2012	35.7	35.7	28.0*

\* From quota monitoring webpage

## TAL/Commercial Quota

The TAL and commercial quota are calculated according to the process illustrated in Figure 1. For 2014, the deduction for U.S. discards is 5,306 mt (ave 2010-2011) resulting in a TAL of 18,979 mt. Updated discards (ave 2010-2012) are 5,264 mt which could allow the TAL to be adjusted upward to 19,825 mt if ABC is not adjusted and upward to 20,756 mt if ABC is adjusted.

The current deduction for recreational landings is 26.5 mt (ave 2010-2011) resulting in a commercial quota of 18,953 mt. Updated recreational landings are 24.0 mt which would allow the commercial quota to be adjusted upward to 19,801 mt if ABC is not adjusted or upward to 20,732 mt if ABC is adjusted.

## Trip Limits

No adjustment to the existing 4,000 pound trip limit is recommended. It was suggested in the Fishery Performance Report (Attachment C) that reconsideration of a single coastwide trip limit would be desirable to many fishermen. An adjustment to the trip limit could be accomplished through the 2016 specifications.

## **Market Issues**

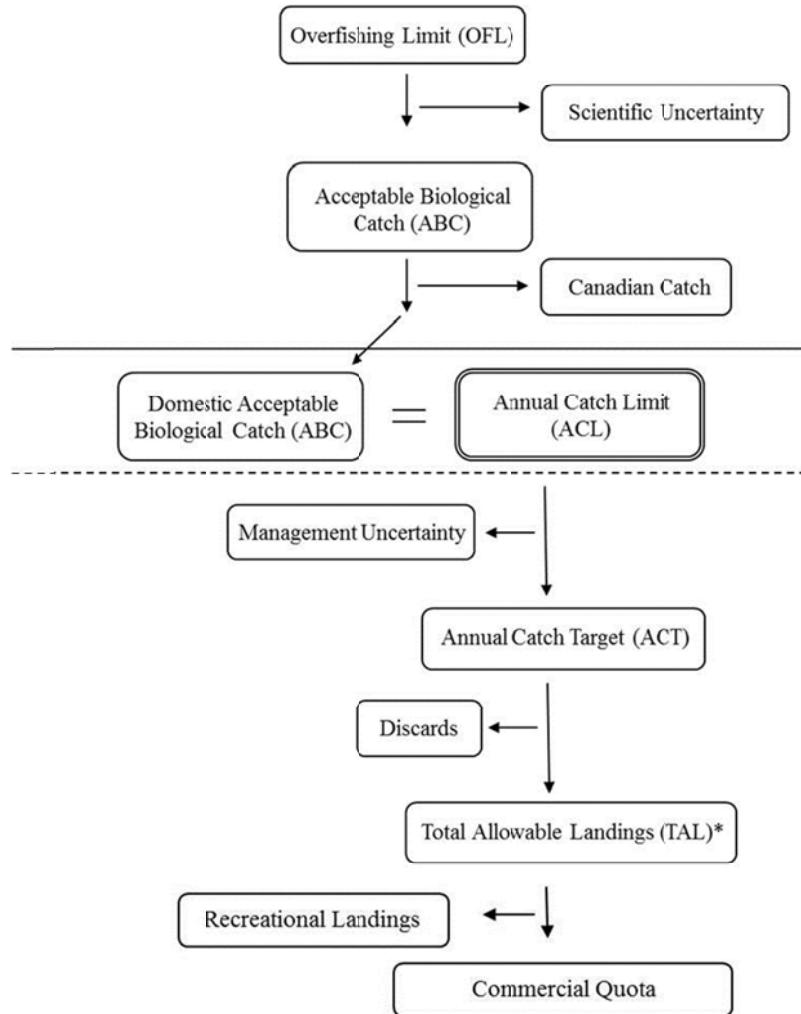
As mentioned in the Fishery Performance Report, there is currently very low demand in the EU for spiny dogfish, and as such domestic processors are not accepting the species at their facilities in typical quantities. The processors normally accept dogfish seven days/week, but they are now only accepting reduced dogfish limits a few days/week. There was an apparent method and standard issue involving PCB detection for seafood in the EU. This has held up demand for the product and has, at least, temporarily depressed that market. There is some hope that as the fresh market opens up, which is usually the beginning of September, the issue may subside.

Apart from this anomalous issue, the overall export demand for the fresh and/or frozen product is not sufficient to accommodate the entire specified 2014 quota of 41 M lb (pers. comm. John Whiteside, Sustainable Fisheries Assoc.). Landings at the levels observed in fishing year 2012 (approximately 30 M lb) are likely to be the standard until a major shift in market demand occurs. Figure 2, below, illustrates the rate of commercial spiny dogfish landings into early September for the current and previous year, which was insufficient to achieve the 2012 quota and is likely insufficient to achieve the larger 2013 quota. Because of these issues, it is not expected that increased available landings would be harvested if management measure adjustments or ABC were to be revised.

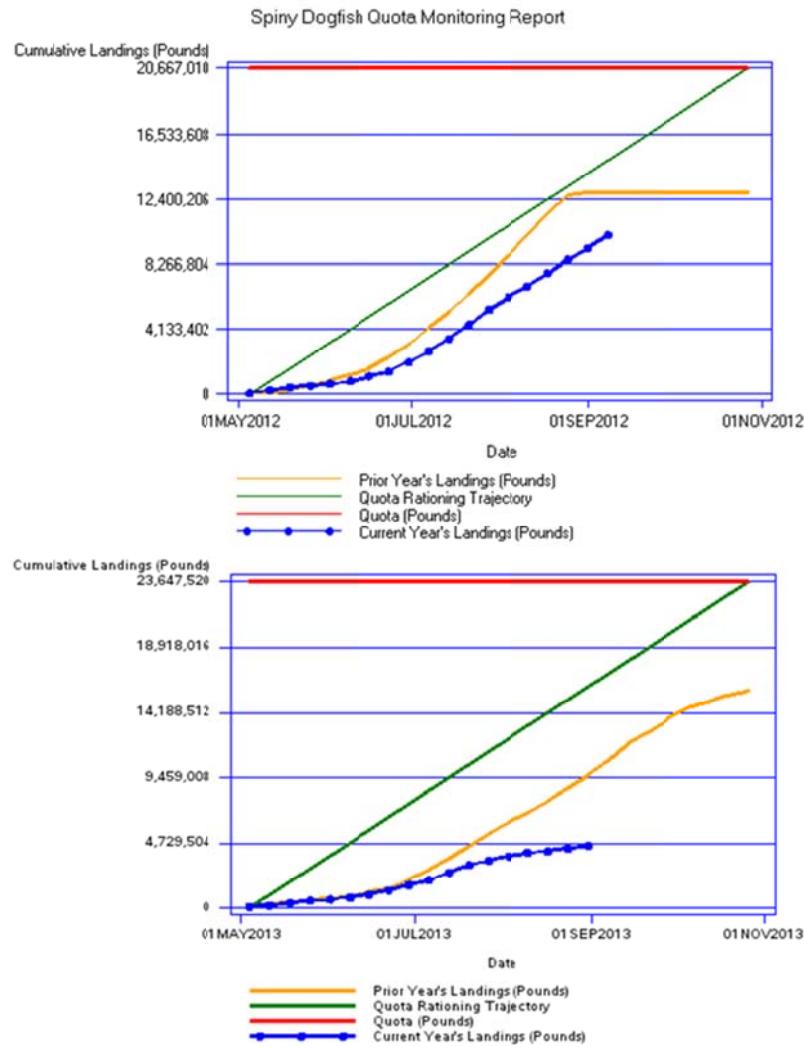
## **Summary**

- The spiny dogfish population is not overfished and overfishing is not occurring for this stock.
- ABC and management measures have already been specified for 2013-2015.
- Although additional catch is available given potential revisions to ABC and management measures, the market would likely be unable to accommodate the increases.
- The staff recommendation is to maintain the existing ABC and management measures for 2014.

### **Spiny Dogfish Flowchart**



**Figure 1. Specification process for spiny dogfish catch regulations as described in the Omnibus ACL/AM Amendment (MAFMC 2011).**



**Figure 2.** Commercial spiny dogfish landings through mid-September in 2012 (top) and 2013 (bottom). From the [NMFS quota monitoring website](#)