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MEMORANDUM

DATE: Sept 10, 2014
TO: Chris Moore, Executive Director
FROM: James Armstrong, Staff Lead, Spiny Dogfish FMP
SUBJECT: Review of Spiny Dogfish Management Measures for 2015

Summary

The most recent spiny dogfish specifications, which were effective August 8, 2014, established management measures for the 2014 and 2015 fishing years. Management measures for the upcoming 2015 fishing year will remain unchanged if the recommended ABC for 2015 (28,310 mt) remains in place following upcoming SSC review. At the Sept 17, 2014 SSC meeting, an update of fishery dependent data will be presented, however, fishery-independent data and an assessment update will not be available given that the NEFSC Spring Trawl Survey was interrupted this year by problems with the trawl vessel. Therefore, the 2013 assessment update (Attachment A) continues to provide the most recent scientific characterization of stock conditions. That assessment update indicates that the spiny dogfish stock is not overfished and that 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 $ABC = 28,310$ mt as the basis for management measures in 2015. ABC for 2015 is the 50th percentile of catches at $F = 0.19235$ from projections based on the most recent (2013) assessment update (Attachment A). The fishing mortality rate $F=0.19235$ used in the projections corresponds to a constant fishing mortality rate consistent with harvest of the 2013 ABC (24,709 mt) and 2014 ABC (27,596 mt), where 2013 ABC had been derived from the Council's risk policy for a level 3 assessment.

In accordance with the FMP, a *domestic* ABC is set equal to ABC minus Canadian landings and ACL is equal to domestic ABC. A value of 65 mt Canadian landings (ave 2010-2012) was used to calculate the domestic ABC / ACL for 2015 (28,245 mt), and updated (2013) Canadian landings are unknown at this time. The ACT for 2015 (28,245 mt) takes into account management uncertainty and for 2014-2015 was based on a tendency toward underharvest of the quota since 2010. Updates such as estimated

discards (5,264 mt applied) and U.S. recreational landings (24.0 mt applied) could modify calculation of management measures even under constant ABC. Once those values are available, the Monitoring Committee will consider the potential for modification of existing measures.

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. The overall specification process is illustrated in Figure 1.

In this memorandum, information is presented to assist the SSC and MC in their roles in the specification process for 2015. The existing spiny dogfish specifications established management measures for the current 2014 as well as the upcoming 2015 fishing year. Specified management measures may remain unchanged if the previously recommended ABC for 2015 (28,310 mt) is determined by the SSC to still be appropriate. This determination would typically follow review of an updated assessment, however, the NEFSC Spring Trawl Survey was interrupted due to vessel problems, and so the major data source for the assessment update is not available. This means that the most best available scientific source for the condition of the stock is the 2013 assessment update (Attachment A). 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 2013

Attachment C: Dogfish AP Webinar Summary – Industry Discussion on Trip Limits

Spiny Dogfish Flowchart

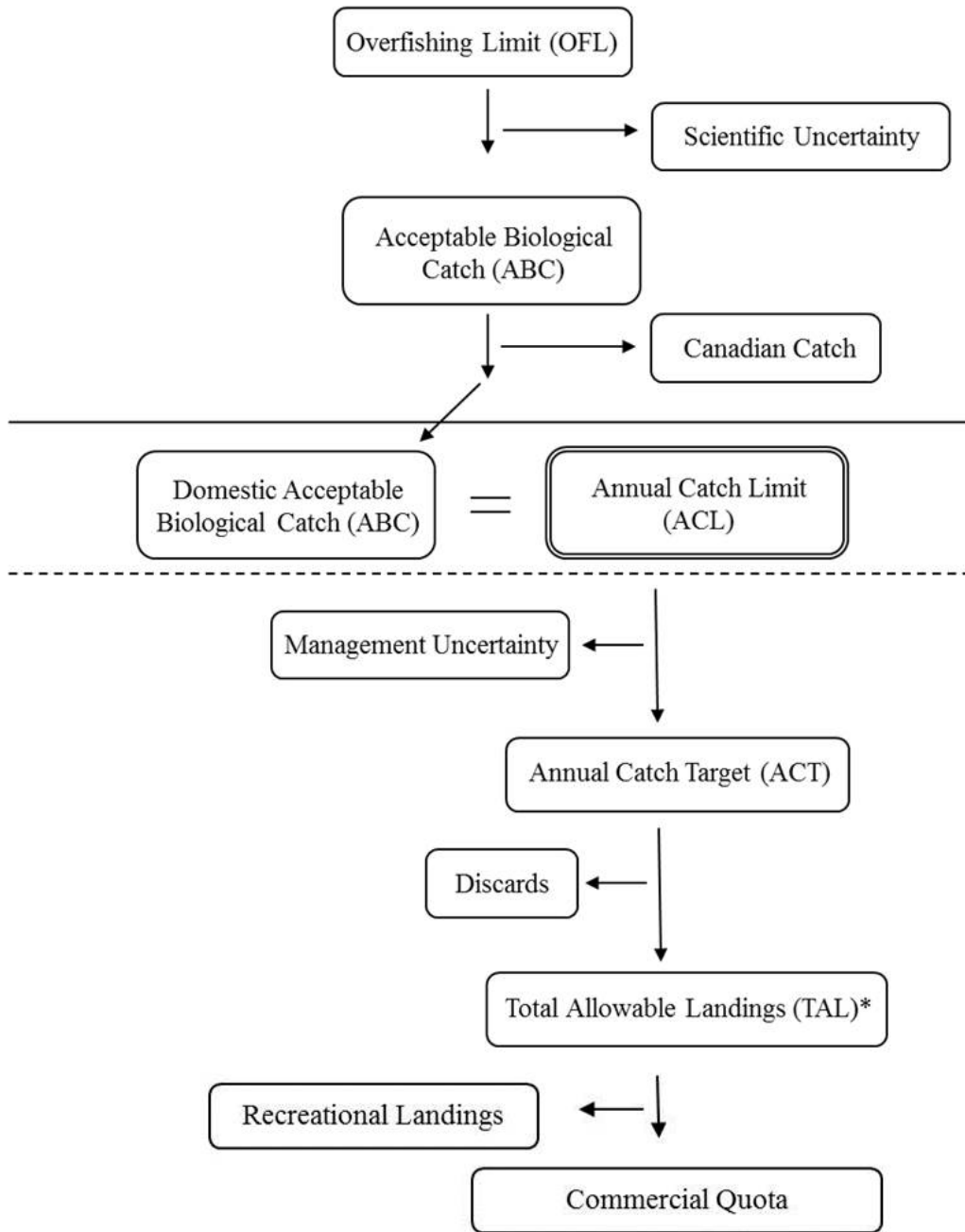


Figure 1. Specification process for spiny dogfish catch regulations as described in the Omnibus ACL/AM Amendment (MAFMC 2011).

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 ~42 M lb in 2013-2015).

Regulatory Review (Current Management Measures)

At its September 17, 2013 meeting the SSC determined ABC for the 2014 and 2015 fishing years based on risk policy for a Level 3 assessment and constant $F = 0.19235$. The fishing mortality rate ($F=0.19235$) corresponded to fishing mortality associated with harvest of ABC in 2013 (Attachment B). Multi-year specifications for 2013 – 2015 were in place when the SSC reviewed ABC in 2013, however, the assessment update provided at that meeting was determined by the SSC to represent best available science, replacing the previous basis for ABC, and so ABC for the remaining years (2014-2015) was revised based on the updated information. The SSC did not choose to extend its ABC recommendations to further years (i.e., 2016 +).

Based on recommendations from the Spiny Dogfish Monitoring Committee, the Council adopted a commercial quota of 22,243 mt (49.037 M lbs) for 2014 and 22,957 mt (50.611 M lb) for 2015. Trip limits of 5,000 lbs were established for both years by NMFS after the MAFMC recommended maintaining 4,000 lb trip limits and the NEFMC recommended eliminating trip limits. The commercial quotas for 2014 and 2015 accommodated reductions from ABC to allow for average discards (5,264 mt) as well as recreational landings (24 mt). These values were taken from the 2013 assessment update (Table 1).

Table1. Derivation of spiny dogfish quotas for 2014 and 2015.

2014 Measures	Basis	M lb	MT
OFL		70.914	32,166
ABC	<i>Constant F (0.19235)</i>	60.839	27,596
Canadian Landings	<i>= ave 2009-2012</i>	0.143	65
Domestic ABC	<i>= ABC – Canadian Landings</i>	60.695	27,531
ACL	<i>= Domestic ABC</i>	60.695	27,531
Mgmt Uncertainty	<i>Ave overage 2010+</i>	0.000	0
ACT	<i>= Domestic ACL – management</i>	60.695	27,531
U.S. Discards	<i>= ave 2002-2012</i>	11.605	5,264
TAL	<i>ACT – Discards</i>	49.090	22,267
U.S. Rec Landings	<i>= ave 2010-2012</i>	0.053	24
Comm Quota	<i>TAL – Rec Landings</i>	49.037421	22,243

2015 Measures	Basis	M lb	MT
OFL			
ABC	<i>Constant F (0.19235)</i>	62.413	28,310
Canadian Landings	<i>= ave 2009-2012</i>	0.143	65
Domestic ABC	<i>= ABC – Canadian Landings</i>	62.270	28,245
ACL	<i>= Domestic ABC</i>	62.270	28,245
Mgmt Uncertainty	<i>Ave overage 2010+</i>	0.000	0
ACT	<i>= Domestic ACL – management</i>	62.270	28,245
U.S. Discards	<i>= ave 2002-2012</i>	11.605	5,264
TAL	<i>ACT – Discards</i>	50.664	22,981
U.S. Rec Landings	<i>= ave 2010-2012</i>	0.053	24
Comm Quota	<i>TAL – Rec Landings</i>	50.611522	22,957

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 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 2015 ABC and Management Measures

ABC, ACL, ACT, and a commercial quota and trip limit for 2015 were established as part of two-year (2014-2015) specifications which were implemented Aug 8, 2014. The existing measures (Table 1 bottom panel) will remain in place unless the specified ABC is either abandoned by the SSC or if the Council chooses to modify any measures for other reasons. In the absence of an assessment update, and associated OFL and B/Bmsy estimates, it is difficult to anticipate how ABC could be re-calculated (i.e., outside of the Council's Risk Policy). As such, maintaining currently specified ABC for 2015 is recommended/expected.

Other management measures could be modified independently of ABC if updated discards, Canadian landings, and recreational landings are meaningfully different from currently applied values. The updated values for these removals are unavailable at the time of this writing. If minor adjustments could be made, it may be imprudent to modify measures since the fishery has underperformed recently (Table 2) and currently specified measures are not expected to constrain harvest or reduce fishing opportunity in 2015.

ABC

ABC for 2015 (28,310 mt) was developed as part of multi-year (2014-2015) ABC determination made by the SSC at its Sept 17, 2013 meeting. The value for ABC in 2014 and 2015 was derived by applying constant $F = 0.19235$ to spiny dogfish harvest projections. Fishing mortality ($F=0.19235$) corresponded to $P^* = 0.40$ with $OFL = 32,166$ mt and $B_{2014}/B_{MSY} > 1$, given full harvest of the 2013 ABC.

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 2015, the specified deduction for Canadian landings is 65 mt (ave 2009-2012) which results in $ACL = 28,245$ mt.

ACT

The Annual Catch Target (ACT) accounts for management uncertainty, and for 2015, no reduction was made such that the ACT (28,245 mt) is equivalent to ACL. Although overages have occurred in the past (Table 2), the fishery has been underperforming (Table 2) due to low market demand, and very little risk is associated with $ACT = ACL$.

Table 2. Summary of spiny dogfish landings relative to the quota(s) for fishing years 2000 - 2013.

Fishing year (May 1 - Apr 30)	Quota (M lb)		Landings (M lb)
	Federal	States'	
2000	4	n/a	8.2
2001	4	n/a	5.1
2002	4	n/a	4.8
2003	4	8.8	3.2
2004	4	4	1.5
2005	4	4	2.6
2006	4	6	6.6
2007	4	6	6.5
2008	4	8	9
2009	12	12	11.8
2010	15	14.4	14.5
2011	20	19.5	22.5
2012	35.7	35.7	26.8
2013	40.8	40.8	16.3

TAL/Commercial Quota

The TAL and commercial quota are calculated according to the process illustrated in Figure 1. For 2015, the deduction for U.S. discards is 5,264 mt which corresponds to a TAL of 22,981 (50.664 M lb). The current deduction for recreational landings is 24.0 mt which corresponds to a commercial quota of 22,957 mt (50.612 M lb).

Trip Limits

No adjustment to the existing 5,000 pound trip limit is recommended. There was substantial discussion of trip limits among fishery participants and the various management bodies (Monitoring Committee, MAFMC, NEFMC, NMFS) that preceded the establishment of the existing limits. (Attachment C). The current 5,000 lb limit reflects a modest increase from the previously specified 4,000 lb trip limit, but is believed to be more in keeping with interests of small vessel participants than would be the elimination of trip limits.

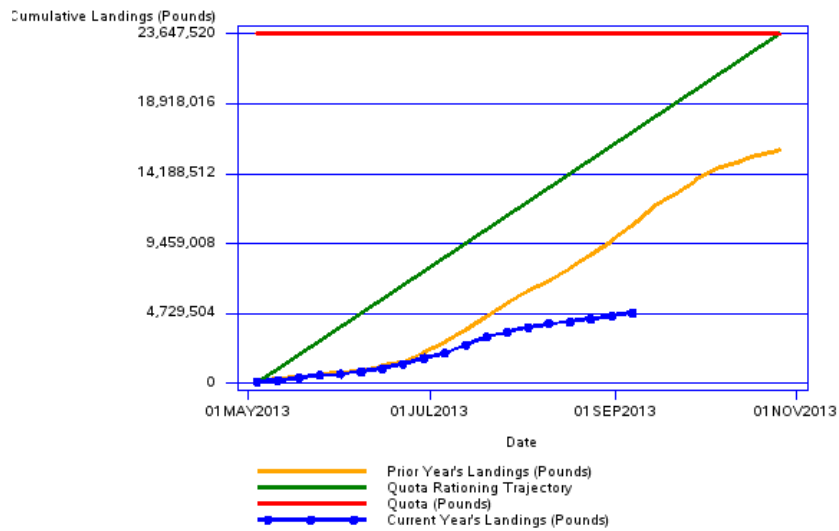
Market Issues

A Fishery Performance Report is forthcoming, however, communication with processors indicates that the market for spiny dogfish is improving compared to last year (Figure 2). Previous constraints on the import of fresh spiny dogfish product into the EU due to PCB standards will potentially resolve within the current fishing year. The demand for the frozen product is currently strong and when/if the fresh product can be sent to the EU, processors will be accepting dogfish seven day/week. Even under those circumstances, it is not expected, that the full quota will be harvested this year or next year. Total harvest in the 2012 fishing year (~27 M lb) is the greatest total harvest since the establishment of the FMP and may be more consistent with harvest potential under good market conditions with the current suite of processors.

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 2015.
- Information is lacking to directly re-estimate ABC using the standard approach, i.e., Council Risk Policy
- Information will be available that may allow modification of other management measures, however the fishery is unlikely to harvest the quota and these modifications would be marginal adjustments.
- There is no compelling rationale for deviating from existing ABC and other management measures for 2015.

Spiny Dogfish Quota Monitoring Report



Spiny Dogfish Quota Monitoring Report

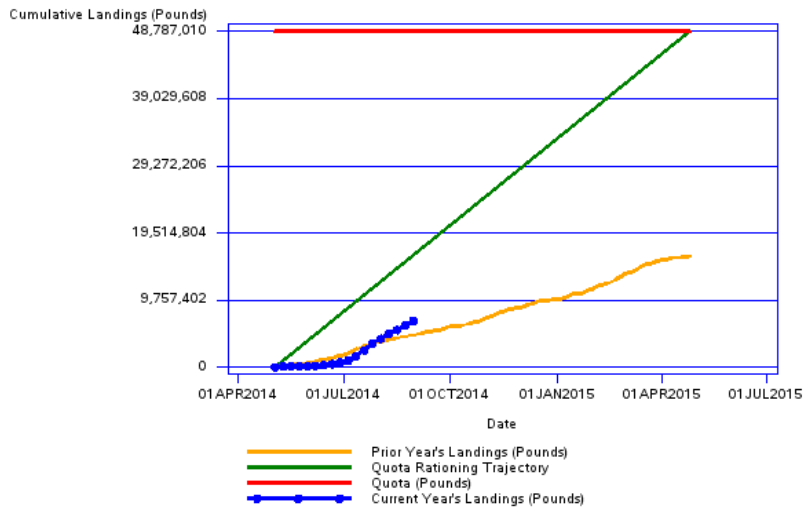


Figure 2. Commercial spiny dogfish landings through early September in 2013 (top) and 2014 (bottom). From the [NMFS quota monitoring website](#)

