

ASMFC Spiny Dogfish Technical Committee
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Report of the ASMFC Spiny Dogfish Technical Committee

By

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The Dogfish Technical Committee met May 7, 2002 at the Holiday Inn at Baltimore-Washington Airport. Meeting was called to order at 0930. The following people were present during the meeting:

ASMFC Dogfish Technical Committee: Chris Batsavage (NC DMF), Steven Correia (MA DMF & TC Chair), Matt Gates (CT DEP), Chris Powell (RI DFW), Bruce Halgren (NJ FGW), Wilson Laney (USFWS), Jeff Tinsman (DE DFW).

ASMFC Dogfish Plan Development Team: Bruce Halgren (NJ FGW), Megan Gamble (ASMFC, Plan Coordinator & PDT Chair), Tina Moore (NC DMF, PDT), Bill Outten (MD DMR).

ASMFC Dogfish Management Board: John Connell (Chair of Management Board)

Others: Paul Rago (NEFSC), Rich Seagraves (MAFMC),

Stock Status

Paul Rago presented a review of spiny dogfish status and risk analysis of alternative management scenarios to the Technical Committee. The stock status report is a review of material previously presented to the ASMFC's Spiny Dogfish Management Board in September 11, 2001. The assessment includes the NEFSC's 2001 survey data. The Technical Committee commended Paul on his presentation of stock status.

Landings. United States landings declined from a peak of 27,241 metric tons in 1997 to 14,906 metric tons in 1999. In response to implementation of the Federal FMP, landings declined to 9,257 in 2000. Canadian landings of spiny dogfish have increased from 416 metric tons in 1996 to 2,660 metric tons in 1999.

Size composition of Commercial Landings. The mean size of commercial landings of female dogfish has declined from 1990 through 2001. The decline includes a reduction in large females as well as an increase in smaller females in the commercial catch. The median length of the catch has been below 80 cm, the size at 50% maturity, since 1997.

Survey Trends. The area swept biomass of mature female biomass ≥ 80 cm is 10.5 kg/tow (mean 1999-2001), which is 34% of the Federal FMP's SSB_{max} . Area swept biomass in the NEFSC spring survey has declined for all sizes since 1992. This decline is most pronounced for sizes ≥ 80 cm, a size group consisting of mostly mature females. Area swept biomass has also declined for females between 36-79 cm during the last three years. Area swept biomass of dogfish ≤ 35 cm, a measure of recruitment, precipitously declined in 1997 and has since remained very low.

Mean length of Female dogfish ≥ 80 cm has declined in the MADMF and NEFSC's Spring and Fall surveys. Comparison of the 1987-89 and 1999-2001 NEFSC spring survey length frequency shows a marked truncation in the size distributions. Current length distribution indicates a loss of both large mature females and pre-recruits (<60 cm).

The change in estimated abundance of mature dogfish is consistent with cumulative removals from slow growing stock. Results suggest that total removals have exceeded productive capacity of the stock.

Fishing mortality rates. Fishing mortality rates are estimated using a Beverton-Holt length based method. Fishing mortality has increased from the 1980's and has been above the F threshold (0.11) since 1991 regardless of assumed ranges of natural mortality (0.06-0.09) or size of entry (70 to 90 cm). Before the directed fishery, mortality was generally low. Fishing mortality rapidly increased when landings increased sevenfold between 1989 and 1996. Although landings began to decline in 1997, fishing mortality remained high due to reduced exploitable stock biomass.

Risk analysis of various rebuilding strategy

The technical committee reviewed the methodology and results of the risk assessment. The risk assessment bootstraps the variation in the starting conditions (mean abundance, 1999-2001) into the projections of the constant harvest and constant fishing mortality strategies. The analysis uses 500 bootstraps samples per strategy. The probability does not incorporate uncertainty in effectiveness in implementation (e.g., constant F or constant quota), growth, or recruitment in future years. Results are shown in Tabled 1A and 1B and Figure 1.

Figure 1. Probability of exceeding biomass rebuilding targets for various management strategies.

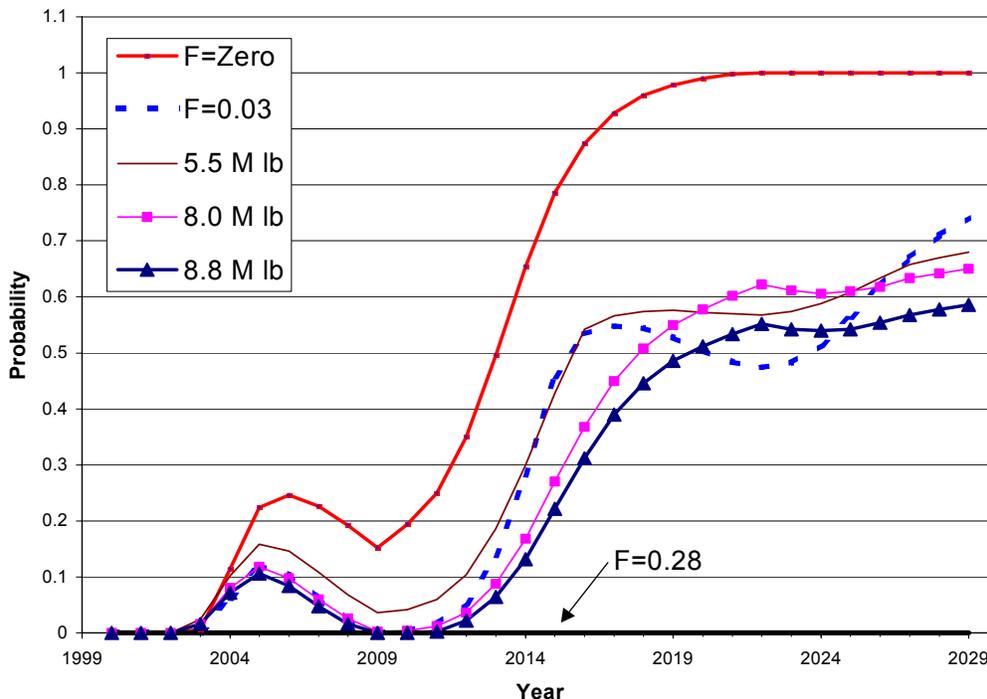


Table 1A. Probability that population exceeds SSB_{max} for 5 management strategies. Shaded cells indicates the first year that the probability of population exceeding SSB_{max} is 50% or higher. (source: Paul Rago, personal communication)

Year	PROBABILITY OF EXCEEDING SSB_{MAX} TARGET					
	Status quo F	F=zero	F=0.03	Constant 8.8 million lb quota	Constant 8.0 million lb quota	Constant 5.5 million lb quota
2000	0	0.00	0.00	0.00	0.00	0.00
2001	0	0.00	0.00	0.00	0.00	0.00
2002	0	0.00	0.00	0.00	0.00	0.00
2003	0	0.01	0.00	0.02	0.02	0.02
2004	0	0.11	0.06	0.07	0.08	0.10
2005	0	0.22	0.12	0.11	0.12	0.16
2006	0	0.25	0.10	0.08	0.10	0.15
2007	0	0.23	0.06	0.05	0.06	0.11
2008	0	0.19	0.02	0.02	0.03	0.07
2009	0	0.15	0.00	0.00	0.00	0.04
2010	0	0.19	0.00	0.00	0.00	0.04
2011	0	0.25	0.02	0.00	0.01	0.06
2012	0	0.35	0.05	0.02	0.04	0.10
2013	0	0.50	0.14	0.06	0.09	0.19
2014	0	0.65	0.28	0.13	0.17	0.30
2015	0	0.79	0.46	0.22	0.27	0.43
2016	0	0.87	0.53	0.31	0.37	0.54
2017	0	0.93	0.55	0.39	0.45	0.57
2018	0	0.96	0.54	0.45	0.51	0.57
2019	0	0.98	0.53	0.49	0.55	0.58
2020	0	0.99	0.50	0.51	0.58	0.57
2021	0	1.00	0.48	0.53	0.60	0.57
2022	0	1.00	0.47	0.55	0.62	0.57
2023	0	1.00	0.48	0.54	0.61	0.57
2024	0	1.00	0.51	0.54	0.61	0.59
2025	0	1.00	0.56	0.54	0.61	0.61
2026	0	1.00	0.62	0.55	0.62	0.63
2027	0	1.00	0.67	0.57	0.63	0.66
2028	0	1.00	0.71	0.58	0.64	0.67
2029	0	1.00	0.74	0.59	0.65	0.68

Table 1b. Year that population rebuilds to SSB_{max} with 50% probability given uncertainty in starting conditions. (source: Paul Rago, personal communication).

Strategy	Year that SSB rebuilt to target at 50% probability
Status quo (F= 0.28)	Probability to rebuild is near zero
Constant F=0.03	2016
Constant 8.8 million lbs. quota	2020
Constant 8 million lbs. quota	2018
Constant quota, rebuild in same time period as constant F strategy (5.5 million lbs.)	2016

Status of Amendment 1 to the Federal Dogfish FMP

Rich Seagraves (MAFMC) provided an update on Amendment 1 to the Joint MAFMC and NEFMC Spiny Dogfish Management Plan. NMFS did not approve the 90% SSB_{max} as a target biomass in the Federal FMP. The Amendment will use a new target biomass of SSB_{max} (in survey units, equivalent to 200,000 metric tons (old scaling) or 167,000 metric tons (new scaling)). The plan will also need to define new rebuilding schedules. Amendment 1 includes the constant F strategy ($F=0.03$), a constant quota strategy, and an option to close the fishery. The Federal Dogfish FMP also contained a 5-year rebuilding strategy that is no longer feasible due to deterioration in stock conditions and non achievement of the proposed fishing mortality reduction schedule. Amendment 1 will need to redefine rebuilding schedules. Amendment 1 will adopt a general strategy of setting a rebuilding schedule in the constant harvest approach equal to the rebuilding schedule of the constant F strategy.

Target Biomass

The Federal FMP uses SSB_{max} as a proxy for B_{msy} . The Federal FMP set 90% SSB_{max} as the rebuilding target (180,000 metric tons, old scaling). This was based on a compromise between the MAFMC preference to use SSB_{max} as a target (200,000 metric tons, old scaling) and the NEFMC preference for a 150,000 metric tons target (old scaling). Subsequently, NMFS disapproved the 90% SSB_{max} target as not compliant with SFA's requirement of B_{msy} or proxy as a target biomass.

The Technical Committee notes that 90% SSB_{max} is not consistent with Federal FMP's Amendment 1 which will require setting the target biomass at 100% SBB_{max} . Selection of 90% SSB_{max} as a target will result in inconsistent targets between ASMFC's plan and the Federal FMP. No technical basis exists for choosing 90% SSB_{max} as a proxy for B_{msy} . The Technical Committee also notes that the footprint of the trawl has been re-estimated since the adoption of the Federal FMP. The revised footprint rescales the estimate of SSB_{max} in area swept units to 167,000 metric tons (new scaling) and the estimate of current biomass. However, the biomass target in the original survey units (kgs per tow) is not affected by changes to the survey footprint or trawl efficiency. Setting the target biomass in survey units will be consistent with units as proposed in the Amendment 1 to the Federal FMP. Table 2 presents the SSB_{max} in survey units, % of SSB_{max} , area swept biomass in old scaling, and area swept biomass in new scaling.

- **The Technical Committee recommends** that the FMP express the biomass target in survey units rather than area swept units. This will allow for easy adjustment if the estimate of survey trawl's footprint or efficiency is re-estimated. To improve clarity, the targets and current biomass can be presented as percentage of the target along with the current estimate new scaling.

Table 2. Proposed target biomass, minimum biomass thresholds, and current SSB expressed in survey units, percentages of SSB_{max}, and area swept (old scaling and new scaling).

	Survey units Kgs/ tow	Percentage of SSB _{max}	Area swept “Old scaling” metric tonnes	Area Swept “New scaling” metric tonnes
100% SSB _{max}	31.0 kgs/tow ¹	100%	200,000	167,000
90% SSB _{max}	27.9 kgs/tow ¹	90%	180,000	150,300
Minimum SSB biomass threshold (1/2 SSB _{max})	15.5 kgs/tow ¹	50%	100,000	83,500
Current SSB (mean 1999-2001)	10.5 kgs/tow	34%	67,741	56,565

¹ Proposed targets and thresholds in survey units were back-calculated from current estimate of $\geq 80\text{cm}$ female biomass (mean 1999-2001) .

The rebuilding schedule for constant quota strategy

The original 4,000 metric tons quota in the constant quota strategy was based on achieving rebuilding in the same schedule as the constant F strategy. Delays in implementation combined with further declines in stock status has created a difference in the rebuilding schedules of the constant F and constant quota strategies. A constant quota of 5.5 millions lbs. rebuilds in the same timeframe as the F=0.03 strategy (50% probability of being rebuilt in 2016).

- **The Technical committee recommends** including a 5.5 million lbs. constant quota approach as an additional option in the FMP. The addition of this option provides a constant quota approach that is similar to one proposed for the Amendment 1 to the Federal FMP.
- **The Technical Committee recommends** setting the minimum probability to define rebuilt in the projections (minimum 50% probability that biomass is equal or above the biomass target).

The Technical Committee notes that a potential gap between implementation date and expiration of the emergency action could allow uncontrolled fishery to exist within state waters.

- **The Technical committee recommends** that the Management Board should consider mechanisms to prevent this from happening.

Management Strategies: Option 2 - Complete Closure

The Technical Committee notes that "no landing and possession of spiny dogfish at all times in state waters" will result in a complete closure of the fishery in both state and federal waters since vessels will be unable to land dogfish taken in the EEZ. The Technical Committee notes if the intent is to close only state water harvesting (not EEZ) then the landing and possession in Option 2 should be modified to read as follows:

"The commercial harvest of spiny dogfish will be prohibited at all times in state waters."

Fishing Year

The Technical Committee has no recommendation for fishing year.

Reference period

Prior to 1988, commercial landings for spiny dogfish and smooth dogfish were lumped into one unclassified dogfish category. After 1988, the separation of spiny and smooth dogfish landings improved, but an unclassified category persisted. The proportion of smooth and spiny dogfish in the unclassified category varies by port, depending on who does the sampling. The ratio of smooth to spiny dogfish is also attributed to the species' geographic ranges and seasonal migration patterns. The smooth dogfish is a more southern species than spiny dogfish and the northern most portion of the smooth dogfish's range is Cape Cod. Whereas, spiny dogfish are found from Maine through North Carolina, and less frequently in South Carolina, Georgia and Florida.

For the 1998 spiny dogfish stock assessment, NMFS analyzed the unclassified category of landings. The analysis showed that, for most states, the unclassified category was almost 100% spiny dogfish. North Carolina analyzed the state's landings from 1995-2000 and applied an average ratio to the unclassified landings prior to 1995 to determine the number of smooth dogfish in the unclassified category. When the ratio was applied to the landings prior to 1995, dogfish landings decreased by 5%. The interstate FMP for spiny dogfish uses the combination of spiny dogfish and unclassified dogfish commercial landings. The implication being that the landings may include some smooth dogfish landings, which may incorrectly increase a state's landings for spiny dogfish. By increasing a state's landings for spiny dogfish, the state's allocation in the state-by-state allocation scheme is larger.

If each state had the same data collection program as North Carolina's, a ratio could be applied to the unclassified category in each state to determine a more accurate estimate of spiny dogfish landings. In the absence of this information for each state and in recognition of the NMFS analysis that finds smooth dogfish are small proportion of the unclassified dogfish landings, the interstate FMP for spiny dogfish uses the combination of spiny dogfish and unclassified dogfish commercial landings for all states.

The proposed allocation schemes uses two different sources of landings data. For all states, except North Carolina, landings are from the National Marine Fisheries Service's unpublished weighout data. The source of the North Carolina landings is the North Carolina Trip Ticket Program.

The NMFS weighout data did not accurately reflect the landings for North Carolina. The NMFS landings for North Carolina (in 1997 - 3,034,748 lbs.) were about half of landings in the North Carolina Trip Ticket Program (in 1997 - 7,608,426 lbs.). In addition, the NMFS database only provides landings from 1997-2000, when North Carolina has steadily landed spiny dogfish throughout the 1990's.

The Technical committee comments that there is no technical basis for developing a preferred reference period. Therefore, the Technical Committee provides no recommendation for determining reference periods.

- **The Technical Committee recommends** that for determining reference periods and allocations, North Carolina's reported landings should be used for North Carolina landings. All other states should use the NMFS landings.

Regional Quota Allocation

The Technical Committee notes that Massachusetts straddles the proposed Gulf of Maine Region and Southern New England. Landings from these two regions occur simultaneously in Massachusetts and will make a regional attribution of landings difficult.

Rollovers

Rollovers will increase the quota in subsequent year and resulting in an increased F and is inconsistent with the constant quota strategy. Rollovers are a risk-prone strategy, especially with the uncertainties in stock size (based on a 3 year average). Furthermore, if stock biomass declines or is over-estimated, the roll-over will increase fishing mortality rates and delay rebuilding. The Technical Committee does not have an analysis to support the cap recommendation of 5%, but the advice is based on recommending a risk-averse strategy.

- **The Technical Committee recommends** no rollover until the stock is fully rebuilt and the rollover should be capped at 5%.

Trip Limits

The effectiveness of the trip limit is based on behavior along with technical interactions with other options within the plan (state quota, designation of fishing year, etc). The technical committee can not comment on the impact of trip limits without knowing options. For example, the choice of an annual quota versus state quota has implications regarding the necessity of trip limits. Higher trip limits allows directed fishing while low trip limits allows only bycatch. The impact of trip limits on discarding has a strong behavioral component as well as technical interactions with other fishery management plans (e.g., Groundfish FMP closes inshore Western Gulf of Maine during months when dogfish are resident, but opens inshore grounds during peak dogfish abundance in the area). A previous analysis conducted for the Federal FMP indicated that discards are similar under a 7,000 lbs. and 600 lbs./300 lbs. trip limit.

The 600 lbs./ 300 lbs. trip limits is based on the Federal FMP. The basis of this trip limit was threefold: 1) prevents a directed fishery, 2) allow the quota to last the entire year and 3) impact the same number of trips in each semi-annual portion of the fishing year. The technical committee notes that options to change the fishing year or to annually change the percentages of semi-annual quota impacts the basis of this alternative

The 7,000 lbs. trip limit is based on Massachusetts' internal water's trip limit set in 2000 and 2001. This was set to allowing a small, directed fishery to occur and achieve economic objectives. This is not linked to the constant quota strategy.

Size limits.

Size limits increase discards and may provide little conservation benefit. As such, the conservation benefits of size limits will be predicated on fishing behavior and discard mortality rates. Similarly, the impact of the slot limits depends on assumptions about the size frequency of

animals available on a tow and discard mortality rate. Imposition of size limits could increase effort on animals within the slot while increasing discarding of animals outside the slot. Evidence that current fishing gear is not selective over the range of minimum size or slot limits being considered in the plan.

- **The Technical Committee recommends** the Management Board not implement a minimum size.

Size specific quotas. The Technical Committee can not provide size specific quota that will reliably correspond to either a fishing mortality target or rebuilding schedule. The inability to build in assumptions about consequences of the fate of the non-selected components into the model will make model results unreliable.

- **The Technical committee recommends** against implementing size specific quotas.

Gender specific quota

The Technical Committee will be unable to provide a gender specific quota that will map into a fishing mortality rate. This will require similar assumptions about behavior, discards, and discard rates that size specific quota engender that make model results not reliable.

- **The Technical committee recommends** against implementing gender specific quotas.

Scientific quota.

The Technical committee notes that setting an separate quota for biomedical and or/scientific supply in addition to the coastwide quota will result in a total quota that is inconsistent with achieving the target fishing mortality rate. In addition, the total quota would be inconsistent with constant quota strategy achieving the same rebuilding schedule as the constant F strategy.

- **The Technical Committee recommends** rejecting setting a separate quota for biomedical/ scientific supply.

Other Technical Committee Recommendations:

- **The Technical Committee recommends** that the time period for *de minimus* status be similar to the allocation period. The basis of this recommendation is to maintain consistency.
- **The Technical Committee recommends** that management of dogfish in state and federal waters should be consistent relative to fishing mortality targets (or quota), biomass targets, and rebuilding strategies.
- **The Technical committee recommends** Steven Correia, Paul Rago, and Alexis Sharov for the stock assessment subcommittee membership and the subcommittee works with the Southern Pelagic Working Group in updating the assessment.

- **The Technical Committee recommended** that the new dogfish assessment be peer-reviewed through the SARC process.

Finally, no nominations for vice chair of the Technical Committee were made. The vice chair position remains vacant.

The Meeting adjourned at 1630 hrs.