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MEMORANDUM

DATE: June 4, 2021

TO: **Scientific and Statistical Committee**

CC: Groundfish Committee

FROM: Jamie M. Cournane, Ph.D., Council Staff

SUBJECT: **Groundfish ABC Control Rule and Issues to Consider**

This year, the Council set a priority to revise acceptable biological catch (ABC) control rules for Northeast Multispecies stocks in consultation with the Scientific and Statistical Committee (SSC). The following memo provides background information for the SSC.

Groundfish ABC Control Rule

The Council's acceptable biological catch (ABC) control rule for stocks in the Northeast Multispecies (Groundfish) plan is as follows:

> *These ABC control rules will be used in the absence of better information that may allow a more explicit determination of scientific uncertainty for a stock or stocks. If such information is available - that is, if scientific uncertainty can be characterized in a more accurate fashion -- it can be used by the SSC to determine ABCs, these ABC control rules can be modified in a future Council action (an amendment, framework, or specification package):*
>
> a. *ABC should be determined as the catch associated with 75% of F_{MSY}.*
> b. *If fishing at 75% of F_{MSY} does not achieve the mandated rebuilding requirements for overfished stocks, ABC should be determined as the catch associated with the fishing mortality that meets rebuilding requirements ($F_{rebuild}$).*
> c. *For stocks that cannot rebuild to B_{MSY} in the specified rebuilding period, even with no fishing, the ABC should be based on incidental bycatch, including a reduction in bycatch rate (i.e., the proportion of the stock caught as bycatch).*
> d. *Interim ABCs should be determined for stocks with unknown status according to case-by-case recommendations from the SSC.*

Issues to Consider

The SSC may wish to discuss possible candidate ABC control rules to recommend to the Council for further consideration. This section provides background on the status of the stocks, rebuilding status, and how the SSC previously applied the ABC control rule.

Current Stock Status

Table 1 summarizes the status of the groundfish stocks as determined by NOAA Fisheries, noting which groundfish stocks are overfished or are experiencing overfishing.

Table 1 - Status of groundfish stocks, determined by NOAA Fisheries.

	Status	
Stock	Overfishing?	Overfished?
Georges Bank Cod	Yes	Yes
Gulf of Maine Cod	Yes	Yes
Georges Bank Haddock	No	No
Gulf of Maine Haddock	No	No
Georges Bank Yellowtail Flounder	Yes	Yes
Southern New England/Mid-Atlantic Yellowtail Flounder	No	Yes
Cape Cod/Gulf of Maine Yellowtail Flounder	No	No
American Plaice	No	No
Witch Flounder	Unknown	Yes
Georges Bank Winter Flounder	No	Yes
Gulf of Maine Winter Flounder	No	Unknown
Southern New England/Mid-Atlantic Winter Flounder	No	Yes
Acadian Redfish	No	No
White Hake	No	Yes
Pollock	No	No
Northern Windowpane Flounder	No	Yes
Southern Windowpane Flounder	No	No
Ocean Pout	No	Yes
Atlantic Halibut	No	Yes
Atlantic Wolffish	No	Yes

Table 2 provides the status determination criteria (SDC) and Table 3 summaries the updated numerical estimates of the SDCs for all groundfish stocks, based on most resent assessment – either the 2017 or 2020 operational assessments. The MSA requires that every fishery management plan specify "objective and measurable criteria for identifying when the fishery to which the plan applies is overfished." Guidance on this requirement identifies two elements that must be specified: a maximum fishing mortality threshold (or reasonable proxy) and a minimum stock size threshold.

The MSA also requires that FMPs specify the maximum sustainable yield and optimum yield for the fishery. The Northeast Fisheries Science Center (NEFSC) conducted assessments for 10 groundfish stocks in 2020. The peer review recommended updated numerical values are provided in Table 3.

Table 2 – Current status determination criteria.

Stock	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Georges Bank Cod	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Gulf of Maine Cod	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Georges Bank Haddock	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Gulf of Maine Haddock	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Georges Bank Yellowtail Flounder	Unknown	Unknown	Unknown
Southern New England/Mid-Atlantic Yellowtail Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Cape Cod/Gulf of Maine Yellowtail Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
American Plaice	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Witch Flounder	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Georges Bank Winter Flounder	SSBMSY	½ Btarget	F_{MSY}
Gulf of Maine Winter Flounder	Unknown	Unknown	F40% MSP
Southern New England/Mid-Atlantic Winter Flounder	SSBMSY	½ Btarget	F_{MSY}
Acadian Redfish	SSBMSY: SSB/R (50% MSP)	½ Btarget	F50% MSP
White Hake	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Pollock	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP
Northern Windowpane Flounder	External	½ Btarget	Rel F at replacement
Southern Windowpane Flounder	External	½ Btarget	Rel F at replacement
Ocean Pout	External	½ Btarget	Rel F at replacement
Atlantic Halibut	Internal	½ Btarget	$F_{0.1}$
Atlantic Wolffish	SSBMSY: SSB/R (40% MSP)	½ Btarget	F40% MSP

Table 3 - Current numerical estimates of Status Determination Criteria, based on 2019 or 2020 assessments.

Stock	Model/ Approach	B_{MSY} or Proxy (mt)	F_{MSY} or Proxy	MSY (mt)
Georges Bank Cod	empirical	NA	NA	NA
Gulf of Maine Cod	ASAP M=0.2	42,692	0.173	7,580
	ASAP M-ramp	63,867	0.175	11,420
Georges Bank Haddock	VPA	138,924	0.33	30,489
Gulf of Maine Haddock	ASAP	7,993	0.369	1,597
Georges Bank Yellowtail Flounder	empirical	NA	NA	NA
Southern New England/Mid-Atlantic Yellowtail Flounder	ASAP	1,779	0.355	492
Cape Cod/Gulf of Maine Yellowtail Flounder	VPA	3,439	0.32	1,138
American Plaice	VPA	15,293	0.258	3,301
Witch Flounder	empirical area swept	NA	NA	NA
Georges Bank Winter Flounder	VPA	8,910	0.519	4,260
Gulf of Maine Winter Flounder	empirical area swept	NA	0.23 (exploitation rate)	NA
Southern New England/Mid-Atlantic Winter Flounder	ASAP	24,687	0.34	7,532
Acadian Redfish	ASAP	247,918	0.038	9,318
White Hake	ASAP	31,828	0.1677	4,601
Pollock	ASAP	124,639	0.272	19,856
Northern Windowpane Flounder	AIM	3.489 kg/tow	0.185 c/i	647
Southern Windowpane Flounder	AIM	0.187 kg/tow	1.780 c/i	333
Ocean Pout	index	4.94 kg/tow	0.76 c/i	3,754
Atlantic Halibut	FSD	NA	NA	NA
Atlantic Wolffish	SCALE	1,612	0.222	232

Rebuilding Plan Status for Groundfish Stocks in Formal Rebuilding Plans

Table 4 summarizes the rebuilding status for each groundfish stock in a formal rebuilding plan.

SSC Recommendations

Table 5 summarizes previous SSC recommendations for groundfish stock through 2017. Attachment #1 is an appendix from Framework Adjustment 59 covering the use of constant ABCs by the SSC.

Table 4- Summary of rebuilding status for groundfish stocks in a formal rebuilding plan based on the most recent assessment in 2019 or 2020.

Groundfish Stock	**Rebuilding Plan Start of the Current Plan**	**Planned Rebuilding Date**	**Years Remaining in Plan, starting with FY2021**	**Total ACLs exceeded within past three completed FYs?** *If yes, identify the FYs.*	**Has the original rebuilding F been achieved? Or is this unknown?** *Indicate the current F estimate relative to F rebuild at the start of the plan.*	**What is current SSB estimate relative to SSBMSY? Or is this unknown?**
Georges Bank cod	5/1/2004	2026	6	No	Unknown	Unknown
Gulf of Maine cod	5/1/2014	2024	4	Yes: [129.5% of the total ACL in FY2017]	F rebuild (plan start) = 0.161 (m=0.2 model) and 0.177 (m-ramp model) F2018 = 0.188 (m=0.2 model) and 0.198 (m-ramp model)	SSB2018 =3,752 mt (m=0.2 model) and 3,838 mt (m-ramp model) 9% and 6%, respectively of SSBMSY
Georges Bank yellowtail flounder	11/22/2006	2032	12	No	Unknown	Unknown
Southern New England/Mid-Atlantic yellowtail flounder	7/18/2019	2029	9	No	F rebuild (plan start) = 0.243 F2018 = 0.259	SSB2018 = 90 mt 5% of SSBMSY
Cape Cod/Gulf of Maine yellowtail flounder	5/1/2004	2023	3	No	F rebuild (plan start) = 0.26 F2018 = 0.092	SSB2018 = 2,125 mt 62% of SSBMSY
Witch Flounder	7/18/2019	2043	23	No	Unknown	Unknown

Groundfish Stock	**Rebuilding Plan Start of the Current Plan**	**Planned Rebuilding Date**	**Years Remaining in Plan, starting with FY2021**	**Total ACLs exceeded within past three completed FYs?** *If yes, identify the FYs.*	**Has the original rebuilding F been achieved? Or is this unknown?** *Indicate the current F estimate relative to F rebuild at the start of the plan.*	**What is current SSB estimate relative to SSBMSY? Or is this unknown?**
Georges Bank winter flounder	7/18/2019	2029	9	No	F rebuild (plan start) = 0.365 F2019 = 0.133	SSB2019 = 2,587 mt 36% SSBMSY
Southern New England/Mid-Atlantic winter flounder	5/1/2004	2023	3	No	F rebuild (plan start) = 0.175 F2019 = 0.077	SSB2019 = 3,638 mt 30% of SSBMSY
White hake	5/1/2004	2014	0	No	F rebuild (plan start) = 1.03 F2018 = 0.1677	SSB2018 = 15,891 mt 50% of SSBMSY
Northern windowpane flounder	7/18/2019	2029	9	No	Unknown	Unknown
Ocean pout	7/18/2019	2029	9	No	Unknown	Unknown
Atlantic halibut	5/1/2004	2055	35	Yes: [103.5% of the total ACL in FY2018 and 102.9% of the total ACL in FY 2019]	Unknown	Unknown
Atlantic wolffish	5/1/2010	Undefined	n/a	No	Unknown	Unknown

Table 5- Overview of recent SSC recommendations for ABCs for groundfish stocks (*last updated for the 2019 SSC meeting, PDT plans to update this*).

Groundfish Stock	Control Rule Prior to 2015	Contol Rule 2015	Contol Rule 2017	Overfishing in 2018	Comments	Projected catch higher than 2018 ABCs?	Pojected catch higher than recent catch?	Biomass and Rebuilding Comments
GB cod	75%Fmsy constant	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	unk	Plan-B smooth	no	stable	Relatively low biomass
GOM cod	average 75%Fmsy constant (3 projections)	average 75%Fmsy constant (3 projections)	average 75%Fmsy constant (2 projections)	yes	F has declined	stabe	stable	Low recent recruitment, cannot rebuild
GB Haddock	75%Fmsy	sensitivity projection 75%Fmsy constant	75%Fmsy constant (short term projection)	no	not constraining	yes	yes	Rebuilt
GOM Haddock	75%Fmsy	75%Fmsy	75%Fmsy	no	not constraining	yes	yes	Rebuilt
GB Yellowtail Flounder	75%Fmsy constant (no projection)	constant catch (no projection, TRAC 2017)	exploitation * area-swept (2 surveys)	unk	empirical	NA	NA	Near record lows
SNE Yellowtail Flounder	long term 75%Fmsy constant	averaging	average Plan-B & projection	no	low recruitment	no	stable	5% SSB_{MSY}, 70%F_{MSY} $F_{REbuild}$
CC/GOM Yellowtail Flounder	75%Fmsy constant	75%Fmsy constant	75%Fmsy constant	no	constant seemed to work	yes	yes	on schedule to rebuild
Plaice	75%Fmsy	75%Fmsy	75%Fmsy	no	higher biomass	yes	yes	Rebuilt
Witch Flounder	Frebuild constant	constant ABC (no projection, SARC 62)	exploitation * Area-swept	unk	empirical	yes	yes	no BRPs
GB Winter Flounder	Frebuild	75%Fmsy constant	75%Fmsy constant	no	low recruitment	no	yes	70%F_{MSY}
GOM Winter Flounder	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	NA	empirical	NA	NA	Little response to low catch and F
SNE/MA Winter Flounder	long term 75%Fmsy constant, different recruitment	75%Fmsy constant	3 year average catch	NA	NA	NA	NA	Biomass is declining, cannot rebuild
Redfish	75%Fmsy	75%Fmsy	75%Fmsy	NA	not constraining	NA	NA	Rebuilt
White Hake	75%Fmsy	75%Fmsy	75%Fmsy (short term projection)	no		no	yes	did not rebuild in 2014
Pollock	75%Fmsy constant	75%Fmsy constant	75%Fmsy constant	no	not constraining	no	yes	Rebuilt
Northern Windowpane Flounder	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	no	index assessment	no	no	70%F_{MSY}
Southern Windowpane Flounder	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	no	index assessment	no	no	Rebuilt
Ocean Pout	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	NA	index assessment	NA	NA	Little response to low catch and F
Halibut	Frebuild	averaging	FSD rate * catch	unk	FSD model	yes	no	Relatively low biomass
Wolffish	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	75%Fmsy constant (no projection)	NA	Data poor, SCALE	NA	NA	Little response to low catch and F

75%Fmsy or Frebuild	7	4	4
75%Fmsy or Frebuild and held constant	5	6	5
75%Fmsy and held constant, no projection	6	7	6
other	2	3	5

Note that no Frebuild ABCs were used in 2015 or 2017

Framework Adjustment 59

To the

Northeast Multispecies Fishery Management Plan

Appendix IV

Overview of Scientific and Statistical Committee's Use of Constant Acceptable Biological Catches (ABCs) for Northeast Multispecies (Groundfish) Stocks, 2007-2020

Overview of Scientific and Statistical Committee's use of Constant Acceptable Biological Catches (ABCs) for Northeast Multispecies (Groundfish) Stocks, 2007-2020

1. This summary of the Scientific and Statistical Committee's (SSC) use and discussion of constant Acceptable Biological Catches (ABCs) since the adoption of the Annual Catch Limit (ACL) requirements in Amendment 16 (A16) is provided for reference. The first ABCs/ACLs were developed in 2009 for the 2010 fishing year. The focus in this paper is on the years when specifications were set for most groundfish stocks. There are some years when a benchmark assessment led to ABCs for a small number of stocks. They are only discussed if considered relevant to the constant ABC issue. The focus is on stocks with an analytic assessment since early in this process it was determined that the projection methodology for the AIM or other empirical models was not appropriate. The summary is provided in chronological order of SSC meetings.

2. **2009**: In 2009 the SSC met to recommend ABCs for fishing years (FY) 2010-2012. **Projected ABCs** were used for all stocks with analytic assessments. The constant ABC approach was not used for any of these stocks.

3. **2010**: After the pollock ABC was set for 2010 using the AIM model, a new analytic assessment was performed in early 2010. Based on this assessment, the NMFS modified the 2010 pollock ABC through an emergency action. The SSC considered the results of this new assessment in the fall ABCs for FYs 2011-2014 were **based on the projection output**. While the constant ABC approach was not used, the ABCs varied only slightly over the three-year time period.

4. **2011**: As part of A16, the original plan was that stock assessments would not be performed for all groundfish stocks every two years. The Plan Development Team (PDT) and the SSC explored alternative ways to set ABCs for the period FYs 2012-2014. This work led to the initial concern over of the poor performance of stock projections. The SSC strongly recommended new stock assessments rather than alternative catch-setting approaches. The NEFSC agreed to conduct stock assessments in 2012.

5. **2012**: There were three SSC meetings in 2012 to address groundfish ABCs and control rules. Over the course of these meetings, the SSC discussed projection performance based on the February 2012 Operational Assessments and recommended groundfish ABCs. The SSC's report written in September 2012 concluded:

> *The SSC reiterates its concern with medium term projections for these stocks and recommends conducting assessments more regularly so that projections are for shorter periods into the future. The SSC agrees with the PDT concern regarding this historical performance, but felt this single analysis was insufficient to justify changing the default control rule for all the groundfish stocks. Changing the default control rule should involve a longer term and more systematic process than time allowed. Instead, the SSC examined each stock on a case-by-case basis to see if there was any reason to change from the default control rule.*

Reasons were found for four stocks: the three yellowtail flounder stocks and witch flounder. A constant ABC was also used for Atlantic wolffish, but this was because the Data Poor Working Group recommended against using projections for this stock. Detailed reasons are provided for each of these stocks below. This was the first time the SSC used a constant ABC approach. It was justified based on specific issues for four of the five stocks. In summary:

a. Georges Bank (GB) yellowtail flounder: An ABC was provided for 2013-2014. The SSC provided three possible ABCs with different levels of a probability of overfishing.
b. Southern New England/Mid-Atlantic (SNE/MA) yellowtail flounder: The SSC developed a new biomass Status Determination Criteria which indicated the stock was fully rebuilt. The long term 75%FMSY catch was used rather than applying this mortality target to the biomass in each year because "The SSC did not want to recommend fishing at a rate that would cause catches to increase suddenly then decrease as the stock is fished down to the new biomass BRP." This **constant ABC** was lower than the catch associated with 75%FMSY in 2013-2015. The SSC commented that future ABCs could be set using 75%FMSY if recruitment remained low, confirming a change in stock productivity.
c. Cape Cod/Gulf of Maine (CC/GOM) yellowtail flounder: The initial appearance of a retrospective pattern raised concern. The projection indicated a large increase in stock size in 2014 and 2015. Because of the additional uncertainty raised by the retrospective pattern, the **constant ABC** was set at the FY 2013 projected value for three years.
d. Witch flounder: The most recent recruitment estimate was large but uncertain. The **constant ABC** was set at the 2013 value using Frebuild for three years.

6. **2013**: The SSC met three times in 2013 to discuss issues related to groundfish ABCs. In January, ABCs for Gulf of Maine (GOM) cod, GB cod, and SNE/MA winter flounder were developed. In August, ABCs for white hake and GB yellowtail flounder were developed. The SSC discussed rebuilding plans for two stocks in May and considered a revision to the GOM haddock ABC in November (changes were not recommended).

a. GOM cod: This was the first time the SSC considered the M=0.2 and Mramp models for GOM cod. The SSC recommended two alternative **constant ABCs** – 1249 mt and 1550 mt – resulting from these models.
b. GB cod: The SSC recommended a three-year **constant ABC** set at the projected value for 2013. In addition to concerns over general groundfish projection performance, the SSC expressed concerns over the truncated age structure, changes in species distribution, and low SSB as reasons for their recommendation.
c. White hake: The SSC considered a constant ABC recommendation but instead used the **projected value** at 75%FMSY for all three years. "This decision was made not because the concerns discussed above have diminished, but rather because, unlike GOM cod and SNE/MA winter flounder, that status of white hake is good. Therefore, the consequences of either concern are less in the near-term."

7. **2014**: The SSC met three times to discuss groundfish ABCs.
    a. GOM haddock: The SSC adopted the **projected ABCs** for the three-year period. While the PDT recommended a constant ABC approach, the SSC noted the strong stock status, SAW/SARC approval of the model, and an upcoming operational assessment. These factors led the SSC to conclude there was a low risk of overfishing if the final model was later determined to be optimistic.
    b. GB yellowtail flounder: The SSC recommended a 2015 ABC based on an estimate of average survey biomass. This was the first year the empirical approach was used.
    c. Pollock: The SSC recommended a **constant ABC** approach based on 75%FMSY, holding the ABC constant at the 2015 value. The SSC noted uncertainties associated with the selectivity and data weighting, as well as the unknown cause of the retrospective pattern.
    d. GB winter flounder: The SSC noted the stock was not overfished but was rebuilding. The SSC did not deviate from the default control rule and **recommended ABCs that increased** over the 2015-2017 period. They noted that an operational assessment was planned for 2015 and the ABCs could be adjusted if necessary.
    e. GOM cod: The SSC recommended a **constant ABC** that was 75% of the OFL. The ABC was held constant in recognition of the difficulties in making projections at low stock sizes and the update assessment scheduled for 2015.
    f. GOM Winter Flounder: The SSC recommended a **constant ABC** based on the fact projections were not available for index-based stock assessments.

8. **2015**: All nineteen groundfish stocks were assessed in an Operational Assessment. The SSC report notes:

> *Developing catch advice based on the operational assessments caused the SSC to question whether its decisions about when to follow the projections and when to deviate from them have been consistent. For the current catch advice, the SSC generally used the projected biomass over all three years if the stock is not below its overfishing threshold, but used only the one-year projection and then held the ABC constant if the stock is overfished. This decision reflects more severe implications of the uncertainties when a stock is at low biomass, and provides greater fishing opportunities when the stock is above its biomass threshold.*

Recommendations are summarized in the table below. Table 1 notes refer to the original SSC report. Of the twelve stocks with analytic assessments and associated projections, the SSC recommended a **constant ABC for eight and a changing ABC for four**. In general, the constant ABC was not used for stocks in good status. The exception was GB haddock where the SSC was concerned about the reduced growth and uncertain size of the 2013 cohort.

Table 1- Summary of approaches used to develop ABC recommendations, changes from status quo ABCs and other notes. "(constant)" means the 2016 ABC recommendation remains unchanged for 2017 and 2018. Excerpt from 2015 SSC Report, as Table 1.

Stock	ABC Approach	Notes
GB cod	Decrease OFL by recent survey trend (-24%) and set ABC at 75% of OFL (constant)	See additional discussion
GOM cod	75% of average of OFLs from the three models (constant)	See additional discussion
GB haddock	75%F_{MSY} × projected 2017 biomass with reduced growth & 2013 cohort (constant)	See additional discussion
GOM haddock	75%F_{MSY} × projected biomass	Recent strong cohort detected by the assessment, but correction is not warranted given its magnitude and observed stock trends.
GB yellowtail flounder	16% exploitation rate applied to average swept-area biomass estimates from three surveys (constant)	Retains status quo ABC for 2016 and 2017; recommendation developed by SSC on Sept. 1 and reported to Council on Sept. 30
SNE/MA yellowtail flounder	Average of estimated 2015 catch (422mt) and 75%F_{MSY} × 2016 projected biomass (111mt) (constant)	See additional discussion
CC/GOM yellowtail flounder	75%F_{MSY} × 2016 projected biomass (constant)	Natural mortality assumption not consistent with other yellowtail stocks.
Plaice	75%F_{MSY} × projected biomass	Used projected catch for 2017 and 2018 despite retrospective due to good stock status.
Witch flounder	75%F_{MSY} × 2016 projected biomass (constant)	$F_{rebuild}$ not used given that projections suggest rebuilding is not possible when F=0; NS1 guidelines suggest 75% F_{MSY} in that case
GB winter flounder	75%F_{MSY} × 2016 projected biomass (constant)	See additional discussion
GOM winter flounder	75%F_{MSY} × 30+ cm biomass (constant)	Stock does not appear to be responding to catches << ABC
SNE/MA winter flounder	75%F_{MSY} × 2017 projected biomass (constant)	See additional discussion
Redfish	75%F_{MSY} × projected biomass	Used projected catch for 2017 & 2018 despite retrospective due to good stock status; Implications of sexual dimorphism warrant further investigation
White hake	75%F_{MSY} × projected biomass	ABC in 2017 and 2018 decrease from 2016 value.
Pollock	75%F_{MSY} × 2016 projected biomass (constant)	SSC concerns about used of domed selectivity function remain, therefore projections past 2016 not utilized
Northern windowpane flounder	75%F_{MSY} × kg/tow (constant)	Recent catches exceed ABCs in some years
Southern windowpane flounder	75%F_{MSY} × kg/tow (constant)	Recent catches exceed ABCs in some years
Ocean pout	75%F_{MSY} × kg/tow (constant)	Stock does not appear to be responding to catches << ABC

Stock	ABC Approach	Notes
Halibut	75% × (2015 OFL + 6% for 5Y) (constant)	See additional discussion
Wolffish	75%F_{MSY} × 2014 exploitable biomass (constant)	Projections not accepted for this stock at the benchmark.

9. **2016**: The SSC discussed several issues related to projections and groundfish control rules in 2016.

a. Witch Flounder. At the request of the Council, the SSC reconsidered the ABC for witch flounder. The Council requested a new ABC that accepted a higher amount of risk than the default control rule. The SSC suggested an increased ABC, but recommended it be held constant for three years: "The SSC is recommending a **constant ABC** for the next three years to be consistent with recent catch advice for other stocks, whereby we generally followed the projections and allowed the ABC to increase through time for stocks that are not overfished, but held the ABC constant to increase the buffer between OFL and ABC for stocks that are overfished."

b. Control rules: In June 2016 the SSC discussed groundfish control rules and projections. With respect to projections the SSC noted it adopted an ad hoc control rule in 2015 that "…called for use of projected biomass in all years for which catch advice is being provided when the assessment concluded that the stock is not overfished, but use of the lowest catch in the projection for all three years when the stock is deemed to be overfished." The SSC discussed whether projections should be related to assessment quality or whether they should be used at all. Ultimately the SSC concluded that "…continued analysis of the benefits and risks of using projections under different circumstances is warranted." Later that year the SSC recommended a review of groundfish control rules.

10. **2017**: The SSC developed recommendations for witch flounder after a benchmark assessment, and for other groundfish stocks after an operational assessment. The witch flounder benchmark adopted an empirical approach. The rationale for the 2017 ABCs is shown in Table 2 (note that this table does not include recommendations for four index-based stocks that are not relevant to this summary). The table notes refer to the original SSC report. Of the eleven stocks with analytic assessments and associated projections, **a constant ABC was recommended for seven and a changing ABC for four**. In general, changing ABCs were recommended when stock status was good. The most notable exceptions were GB haddock and pollock, where the SSC recommended a constant ABC.

11. **2019-2020**: The SSC made recommendations for the groundfish stocks assessed in an operational/management track assessment. The SSC recommended a **constant ABC for five stocks that had an analytic assessment** with associated projections. See Appendix 1 of FW59.

12. **Discussion**: The SSC's use of constant ABCs evolved over the period 2012-2020. First used in 2012, notable was the statement of the SSC's use of this approach in 2015. Recognizing that it had been inconsistent in the application of this adjustment, in 2015 the SSC said "For the current catch advice, the SSC generally used the projected biomass over all three years if the stock is not below its overfishing threshold, but used only the one-year projection and then held the ABC constant if the stock is overfished." Even the 2015 ABCs deviated from this general approach in the case of GB haddock and pollock – two stocks that were not overfished - but the SSC explained its decisions based on stock-specific assessment uncertainties.

Table 2- Summary of approaches used to develop ABC recommendations, changes from status quo ABCs and other notes. "(constant)" means the 2018 ABC recommendation remains unchanged for 2019 and 2020.Excerpt from 2017 SSC Report, Table 1.

Stock	ABC Approach	Notes
GB cod	Plan-B smooth; OFL = recent catch x recent survey trend, ABC = 75%OFL (constant)	See detailed notes above
GOM cod	OFL = average of two FMSY projections from two models (m=0.2 and Mramp assuming M=0.4 in the projection), ABC=75%OFL (constant)	See detailed notes above
GB Haddock	75%FMSY projection which incorporates reduced growth and adjustments to selectivity for the large 2013 year class (constant)	2013 cohort believed to be better estimated so not adjusted
GOM Haddock	75%FMSY projection	New recreational dead discard estimate used
GB Yellowtail Flounder	Exploitation rate applied to average swept-area biomass estimates from three surveys (constant)	Dispensed with at Sept 2017 Council meeting
SNE/MA Yellowtail Flounder	Average of 75%FMSY projection and 75%OFL from plan-B smooth (constant)	See detailed notes above
CC/GOM Yellowtail Flounder	75%FMSY projection (constant)	See detailed notes above
American Plaice	75%FMSY projection	See detailed notes above
Witch Flounder	Exploitation rate applied to 3 year average swept-area biomass estimates using two surveys in each year (constant)	See detailed notes above
GB Winter Flounder	75%FMSY projection (constant)	See detailed notes above
GOM Winter Flounder	75%FMSY X 30+cm biomass from survey area swept	See detailed notes above; Incorporates new estimate of Q from the sweep experiment
SNE/MA Winter Flounder	Average of 3 years of catch	See detailed notes above
Acadian Redfish	75%FMSY projection	Used projected catch for 2017 & 2018 despite retrospective due to good stock status
White Hake	75%FMSY projection	ABC in 2018 - 2020 decrease from 2016 value
Pollock	75%FMSY projection (constant)	See detailed notes above
Northern Windowpane Flounder	75%FMSY × 3 year average kg/tow (constant)	See detailed notes above