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MEMORANDUM

DATE: November 7, 2018

TO: Groundfish Committee

FROM: Groundfish Plan Development Team

SUBJECT: **Draft analysis for Framework Adjustment 58**

The Groundfish Plan Development Team (PDT) met on October 16, 2018 to discuss the development of Framework Adjustment 58 (FW58) alternatives and plan for environmental impacts analysis. The PDT also aims to distribute the draft environmental assessment (i.e., introduction, alternatives, and impacts analysis) as a single document for the December Council meeting. The following summarizes the PDT's progress to date.

Rebuilding Plan Options
The PDT drafted rebuilding plan options for the Committee to consider (see Attachment #1).

Some questions/comments from the PDT to the Committee include:

1. Which options by stock would the Committee like to add to the range of alternatives?
2. Some options require additional input from the Committee– see highlighted text in the Attachment.

After the Committee provides its recommendations on the rebuilding plan options by stock, the PDT plans to update the alternatives and prepare the impacts analysis for that section.

Draft Impacts Analysis
The PDT's draft impact analysis attached to this memo includes those sections marked with an "X" (Attachment #2). Much of the analysis was previously provided in PDT memos to the Committee and Scientific Statistical Committee. The results from the Quota Change Model will be presented to the Committee separately.

Section	Rebuilding Plans	Annual Catch Limits	Minimum Fish Size Exemptions in the NAFO Regulatory Area	Scallop Accountability Measure Policy
Biological		X (partial)	X	X
Essential Fish Habitat				
Protected Resources		X	X	X
Social-Economic		X (partial)		

Attachment #1

The PDT drafted options for the Committee to consider adding to the Framework 58 alternatives.

4.1 Updates to Formal Rebuilding Programs and Annual Catch Limits

4.1.1 Formal Rebuilding Programs

4.1.1.1 Georges Bank Winter Flounder Rebuilding Strategy

Based on the 2017 peer review of the Operational Assessment, GB winter flounder was not overfished, and overfishing was not occurring. A retrospective adjustment was applied to the terminal year (2016) estimates of F and SSB in the assessment. The rho adjusted estimate of SSB in 2016 was 3,946mt, while SSB_{MSY} is 7,600mt. GB winter flounder is in a rebuilding plan with a rebuild by date of 2017 with a 75% probability of achieving SSB_{MSY}. Projections at the time of the assessment indicated that the stock could not rebuild by 2017 with F=0. A revised rebuilding plan is needed. Biological reference points were defined as F_{MSY} = 0.522 and SSB_{MSY} = 7,600 mt during the 2017 operational assessment.

4.1.1.1.1 Option 1: No Action

No Action. *Option 1/No Action- previously thought to rebuild by 2017* - Fishing mortality will target rebuilding of the stock with a 75 percent probability of success by 2017, according to Amendment 16 calculations. Amendment 16 implemented the rebuilding plan. The stock did not rebuild by that date, and in August 2017, the Council was notified that the current rebuilding strategy had not resulted in adequate progress towards rebuilding. As a result, section 304(e)(3) of the Magnuson-Stevens Act requires that a revised rebuilding program be implemented within 2 years for GB winter flounder. This No Action alternative would not address this Magnuson-Stevens Act requirement. If this option is adopted, fishing mortality (set at 75% F_{MSY}) would be maintained in 2021. However according to the ABC control rule, because the stock did not rebuild by 2017, fishing mortality could be based on incidental bycatch (i.e.., set as close to zero as possible) starting in 2020 or 2021.

4.1.1.1.2 Option 2: Revised Rebuilding Strategy for Georges Bank Winter Flounder

Based on the rebuilding projections, the minimum time for rebuilding (T_{min}) for GB winter flounder is 3 years, when assuming F=0 beginning in 2021, with a 50% probability of achieving B_{MSY}. The rebuilding plan should be initiated in 2019 and therefore January 1, 2020 will be the first year. The stock would be expected to rebuild by 2022. Therefore, the maximum time for rebuilding T_{max} is 10 years, rebuilding by 2029.

Two sub-options are being considered for a revised rebuilding strategy for GB winter flounder. The rebuilding options assume no changes to the FY 2018-2020 ABCs that were previously recommended by the SSC, and adopted by FW57.

Sub-Option A- T_{target} is *less than 10 years (prior to 2029)*. Select one of the following:

1. GB winter flounder could rebuild in less than 10 years. T_{target} of 4 years, rebuilding by 2023, at $F_{rebuild}$ of 50%F_{MSY} = 0.261, which results in a 59% probability of achieving SSB_{MSY}.
2. GB winter flounder could rebuild in less than 10 years. T_{target} of X years, rebuilding by 202X, at $F_{rebuild}$ of XX%F_{MSY} (percentage to be specified between 50%F_{MSY} and 75%F_{MSY}), which results in a XX% probability of achieving SSB_{MSY}.
3. GB winter flounder could rebuild in less than 10 years. T_{target} of 5 years, rebuilding by 2024, at $F_{rebuild}$ of 75%F_{MSY} = 0.392, which results in a 53% probability of achieving SSB_{MSY}.

Rationale: These options suggest that rebuilding can occur at less than 10 years, at various fishing mortality rates. Additional factors were not considered when developing these options.

Sub-Option B - $T_{target} = T_{max}$, which is *10 years (2029)*. Select one of the following:

1. GB winter flounder could rebuild in 10 years. T_{target} of 10 years, rebuilding by 2029, at $F_{rebuild}$ of $50\%F_{MSY} = 0.261$, which results in a 92% probability of achieving SSB_{MSY},
2. GB winter flounder could rebuild in 10 years. T_{target} of 10 years, rebuilding by 2029, at $F_{rebuild}$ of XX%F_{MSY} (percentage to be specified between $50\%F_{MSY}$ and $75\%F_{MSY}$), which results in a XX% probability of achieving SSB_{MSY} or
3. GB winter flounder could rebuild in 10 years. T_{target} of 10 years, rebuilding by 2029, at $F_{rebuild}$ of $75\%F_{MSY} = 0.392$, which results in a 72% probability of achieving SSB_{MSY}.

Rationale: Projections suggest that the stock can rebuild in five years (2024) at F_{MSY}. The 10-year option might still be justified based on concerns that recruitment may not increase quickly to the average as assumed in the rebuilding projections and concerns remain that long term projections tend to be overly optimistic.

4.1.1.2 Southern New England/Mid-Atlantic Yellowtail Flounder Rebuilding Strategy

Based on the 2017 peer review of the Operational Assessment, SNE/MA yellowtail flounder was overfished, and overfishing was occurring in 2016. A retrospective adjustment was applied to the terminal year (2016) estimates of F and SSB in the assessment. The rho adjusted estimate of SSB in 2016 was 157mt, while the SSB_{MSY} proxy was 1,987mt. The stock is not currently in a rebuilding plan, because it was considered rebuilt as of 2011. A new rebuilding plan needs to be developed. Biological reference points were defined as $F_{MSY} = 0.341$ and $SSB_{MSY} = 1{,}860$ mt in the 2017 operational assessments.

4.1.1.2.1 Option 1: No Action

No Action. *Option 1/No Action- previously thought to rebuild by 2014 and rebuilt as of 2011* – The rebuilding program was developed to rebuild the stock with a median (50 percent) probability by 2014. Amendment 13 implemented the rebuilding plan. This stock therefore has no rebuilding plan.

4.1.1.2.2 Option 2: Revised Rebuilding Strategy for Southern New England/Mid-Atlantic Yellowtail Flounder

Based on the rebuilding projections, the minimum time for rebuilding (T_{min}) for SNE/MA yellowtail flounder is 3 years, when assuming F=0 beginning in 2021, with a 50% probability of achieving B_{MSY}. The rebuilding plan should be initiated in 2019 and therefore January 1, 2020 will be the first year. The stock would rebuild by 2022. Therefore, the maximum time for rebuilding T_{max} is 10 years, rebuilding by 2029.

Two sub-options are being considered for a revised rebuilding strategy for SNE/MA yellowtail flounder. The rebuilding options assume no changes to the FY 2018-2020 ABCs that were previously recommended by the SSC, and adopted by FW57.

Sub-Option B: T_{target} is *less than 10 years (prior to 2029)*

1. SNE/MA yellowtail flounder could rebuild in less than 10 years. T_{target} of 3 years, rebuilding by 2022, at $F_{rebuild}$ of 50%F_{MSY} = 0.171 , which results in a 51% probability of achieving SSB_{MSY}.
2. SNE/MA yellowtail flounder could rebuild in less than 10 years. T_{target} of X years, rebuilding by 202X, at $F_{rebuild}$ of XX%F_{MSY} (percentage to be specified between 50%F_{MSY} and 75%F_{MSY}), which results in a XX% probability of achieving SSB_{MSY}.
3. SNE/MA yellowtail flounder could rebuild in less than 10 years. T_{target} of 4 years, rebuilding by 2023, at $F_{rebuild}$ of 75%F_{MSY} = 0.256, which results in a 59% probability of achieving SSB_{MSY}.

Rationale: These options suggest that rebuilding can occur at less than 10 years, at various fishing mortality rates. Additional factors were not considered when developing these options.

Sub-Option B - $T_{target} = T_{max}$, which is *10 years (2029)*.

1. SNE/MA yellowtail flounder could rebuild in 10 years. T_{target} of 10 years, rebuilding by 2029, at $F_{rebuild}$ of 50%F_{MSY} = 0.171, which results in a 93% probability of achieving SSB_{MSY}.
2. SNE/MA yellowtail flounder could rebuild in 10 years. T_{target} of 10 years, rebuilding by 2029, at $F_{rebuild}$ of XX%F_{MSY} (percentage to be specified between 50%F_{MSY} and 75%F_{MSY}), which results in a XX% probability of achieving SSB_{MSY}.
3. SNE/MA yellowtail flounder could rebuild in 10 years. T_{target} of 10 years, rebuilding by 2029, at $F_{rebuild}$ of 75%F_{MSY} = 0.256, which results in a 79% probability of achieving SSB_{MSY}.

Rationale: Projections suggest that the stock can rebuild in five years (2024) at F_{MSY}. The 10-year option might still be justified based on concerns that recruitment may not increase quickly to the average as assumed in the rebuilding projections and concerns remain that long term projections tend to be overly optimistic.

4.1.1.3 Witch Flounder Rebuilding Strategy

Based on the 2017 peer review of the Operational Assessment, witch flounder was overfished, and overfishing was unknown in 2016. Witch flounder is in a rebuilding plan with a rebuild by date of 2017, but projections are not possible with the current empirical model formulation. A revised rebuilding plan is needed. However, F_{MSY} and SSB_{MSY} or B_{MSY} are undefined.
In the absence of reference points, an evaluation of progress towards rebuilding, or a determination of when the stock rebuilds cannot be assessed.
There are significant challenges in rebuilding a stock when both an overfishing rate and a rebuilt biomass target are unknown. Without a rebuilt biomass target it will be difficult to conclude that this stock is rebuilt even if there are indications that stock biomass has increased.

4.1.1.3.1 Option 1: No Action

No Action. *Option 1/No Action- previously thought to rebuild by 2017* - Fishing mortality targeted rebuilding of the stock with a 75 percent probability of success by 2017, based on Amendment 16 calculations. Amendment 16 implemented the rebuilding plan. If this option is adopted, fishing mortality (set at an exploitation rate, currently 7 percent) would be maintained in 2021.

4.1.1.3.2 Option 2: Revised Rebuilding Strategy for Witch Flounder

The witch flounder assessment is based on an empirical model and does not have a projection model. Therefore, T_{min} when F=0 is undefined and thus, T_{min} could be less than or greater than 10 years. Without T_{min}, no direct methods for estimating T_{max} are available.

Two sub-options are being considered for a revised rebuilding strategy for witch flounder. The rebuilding options assume no changes to the FY 2018-2020 ABCs that were previously recommended by the SSC, and adopted by FW57.

Sub-Option A- T_{target} is *10 years (2029) choose* $F_{rebuild}$ *as an exploitation rate less than or equal to(0.07* (percentage to be specified less than 7 percent). - No projections are available for this stock. A 10-year rebuilding plan was developed in the absence of projections.

Rationale: By comparison, for stocks with projections under the groundfish ABC control rule, most groundfish stocks would be expected to rebuild in 10 years when fishing at $75\%F_{MSY}$. Although for these stocks, rebuilding was not achieved as previously planned despite application of the control rule.

Sub-Option B - T_{target} is *undefined, choose* $F_{rebuild}$ *as an exploitation rate less than or equal to 0.07* (percentage to be specified less than 7 percent).

Rationale: Other factors could be considered when a developing rebuilding plan for this stock. An examination of the yield-per-recruit analysis from the 2015 assessment of witch flounder suggests a mean generation time of 9 years, when F=0. Witch flounder are long-lived species, and a T_{target} of 10 years may be too short given their life history. However, in the previously developed witch flounder rebuilding plan the stock was able to rebuild according to the projections. In addition, there were signs of a relatively large incoming year class (2013) in multiple surveys which could indicate rebuilding is possible for this stock.

4.1.1.4 Northern Windowpane Flounder Rebuilding Strategy

Based on the 2017 peer review, northern windowpane flounder was overfished but overfishing was not occurring in 2016. Northern windowpane flounder is in a rebuilding plan, which was intended to rebuild by 2017. However, in 2016 biomass was only at 17% of the B_{MSY} target. The relationship between the catch and the survey index appears to be worsening in the 2017 operational model. Catch projections are not acceptable for this stock. A revised rebuilding plan is needed. Biological reference points were defined as F_{MSY} proxy = 0.34 and B_{MSY} proxy = 2.06 kg/tow in the 2017 operational assessments.

4.1.1.4.1 Option 1: No Action

No Action. *Option 1/No Action - previously expected to rebuild by 2017* - The goal was to rebuild this stock by 2017. No probability was associated with this goal since it was an index-based stock and the projection methodology was deterministic. In addition, the Council did not identify a specific rebuilding mortality target because the GARM III panel concluded that given the high uncertainty of index-based assessments, it was not appropriate to calculate $F_{rebuild}$ for this stock. Amendment 16 implemented the rebuilding plan.

4.1.1.4.2 Option 2: Revised Rebuilding Strategy for Northern Windowpane Flounder

The Northern windowpane flounder assessment does not have a rebuilding projection model. Therefore, T_{min} when F=0 is undefined and thus, T_{min} could be less than or greater than 10 years. Without T_{min}, no direct methods for estimating T_{max} are available.

Two sub-options are being considered for a revised rebuilding strategy for Northern windowpane flounder. The rebuilding options assume no changes to the FY 2018-2020 ABCs that were previously recommended by the SSC, and adopted by FW57.

Sub-Option A- T_{target} is *10 years (2029)- choose $F_{rebuild}$ of either $50\%F_{MSY}$ or $75\%F_{MSY}$ or percentage to be specified between $50\%F_{MSY}$ and $75\%F_{MSY}$*. No projections are available for this stock. Therefore, a 10-year rebuilding plan was developed in the absence of projections.

Rationale: By comparison, for stocks with projections under the groundfish ABC control rule, most stocks would be expected to rebuild in 10 years when fishing at $75\%F_{MSY}$. Although for these stocks, rebuilding was not achieved as previously planned despite application of the control rule.

Sub-Option B - T_{target} is *undefined, choose $F_{rebuild}$ of either $50\%F_{MSY}$ or $75\%F_{MSY}$ or percentage to be specified between $50\%F_{MSY}$ and $75\%F_{MSY}$.*

Rationale: Other factors could be considered when a developing rebuilding plan for this stock. For Northern windowpane flounder, no aging data is currently available. Therefore, an evaluation of mean generation time is not possible. Recently, overfishing ended on Northern windowpane flounder which may suggest a positive sign for the stock toward becoming not overfished, indicating a T_{target} of 10 years may be appropriate but this is uncertain.

4.1.1.5 Ocean Pout Rebuilding Strategy

Based on the 2017 peer review, ocean pout was overfished but overfishing was not occurring in 2016. Ocean pout is in a rebuilding plan but did not rebuild by 2014 as planned. In 2016, biomass was at 5% of the B_{MSY} target. Catch projections are not possible for this stock. A revised rebuilding plan is needed. Low fishing morality and reductions in catch over time have not resulted in a response in this stock. Productivity appears to be low. Similar trends were also seen in the wolffish stock, and rebuilding was undefined for wolffish. A similar undefined determination could be made for ocean pout. Biological reference points were defined as $F_{MSY\ proxy}$ = 0.76 and $B_{MSY\ proxy}$ = 4.94 kg/tow in the 2017 operational assessments.

4.1.1.5.1 Option 1: No Action

No Action. *Option 1/No Action- rebuild by 2014* – The rebuilding program was developed to rebuild the stock with a median (50 percent) probability by 2014. Amendment 13 implemented the rebuilding plan.

4.1.1.5.2 Option 2: Revised Rebuilding Strategy for Ocean Pout

The ocean pout assessment does not have projections. Therefore, T_{min} when F=0 is undefined and thus, T_{min} could be less than or greater than 10 years. Without T_{min}, no direct methods for estimating T_{max} are available.

Two sub-options are being considered for a revised rebuilding strategy for ocean pout. The rebuilding options assume no changes to the FY 2018-2020 ABCs that were previously recommended by the SSC, and adopted by FW57.

Sub-Option A- T_{target} is *10 years (2029)- choose $F_{rebuild}$ of either $50\%F_{MSY}$ or $75\%F_{MSY}$ or percentage to be specified between $50\%F_{MSY}$ and $75\%F_{MSY}$*. No projections are available for this stock. Therefore, a 10-year rebuilding plan was developed in the absence of projections.

Rationale: By comparison, for stocks with projections under the groundfish ABC control rule, most stocks would be expected to rebuild in 10 years when fishing at $75\%F_{MSY}$. Although for these stocks, rebuilding was not achieved as previously planned despite application of the control rule.

Sub-Option B - T_{target} is undefined, *choose $F_{rebuild}$ of either $50\%F_{MSY}$ or $75\%F_{MSY}$ or percentage to be specified between $50\%F_{MSY}$ and $75\%F_{MSY}$*.

Rationale: For ocean pout, no aging data is currently available. Therefore, an evaluation of mean generation time is not possible. Ocean pout has not responded to low catches over many years, despite low relative F, indicating a T_{target} of 10 years may be too short.

Attachment #2

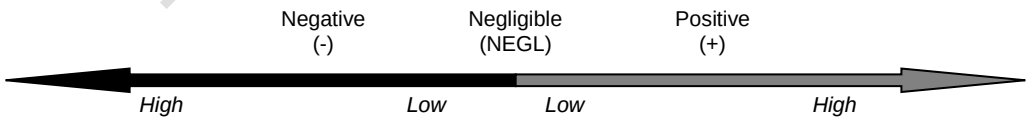
7.0 Environmental Consequences – Analysis of Impacts

Evaluation Criteria

This EA evaluates the potential impacts using the criteria outlined in Table 1. Impacts for all alternatives are judged relative to the baseline conditions, as described in Section 6.0, and compared to each other.

Table 1 - Impact designations in this document are defined generally as positive, negligible/neutral, and negative.

	Direction		
VEC	**Positive (+)**	**Negative (-)**	**Negligible/Neutral**
Allocated target species, other landed species, and protected resources	Actions that increase stock/population size for stocks in rebuilding. For stocks that are rebuilt, actions that maintain stock population sizes at rebuilt levels. For protected resources, actions that increase the population size, or decrease gear interactions.	Actions that decrease stock/population sizes for overfished stocks. Actions that would cause a rebuilt stock to become overfished. For protected resources, actions that decrease the population size, or increase or maintain gear interactions.	Actions that have little or no positive or negative impacts to stocks/populations
Physical Environment/ Habitat/EFH	Actions that improve the quality or reduce disturbance of habitat	Actions that degrade the quality or increase disturbance of habitat	Actions that have no positive or negative impact on habitat quality
Human Communities	Actions that increase revenue and social well-being of fishermen and/or associated businesses	Actions that decrease revenue and social well-being of fishermen and/or associated businesses	Actions that have no positive or negative impact on revenue and social well-being of fishermen and/or associated businesses
Impact Qualifiers:			
All VECs: Mixed	**both positive and negative**		
Low (L, as in low positive or low negative)	To a lesser degree		
High (H; as in high positive or high negative)	To a substantial degree (not significant)		
Likely	Some degree of uncertainty associated with the impact		



7.1 Biological Impacts

Biological impacts discussed below focus on expected changes in fishing mortality for regulated multispecies stocks. Changes in fishing mortality may result in changes in stock size. Impacts on essential fish habitat and endangered or threatened species are discussed in separate sections. Impacts are discussed in relation to impacts on regulated multispecies (groundfish) and other species. The impacts associated with the measures are anticipated to not be significant.

Throughout this section, impacts are often evaluated using an analytic technique that projects future stock size based on the results of a recent age-based assessment. These projections are known to capture only part of the uncertainties that are associated with the assessment projections. There is evidence, that in the case of multispecies stocks, that the projections tend to be optimistic when they extend beyond a short-term period (i.e., 1-3 years). This means that the projections tend to over-estimate future stock sizes and under- estimate future fishing mortality. Attempts to find a way to make the projections more accurate have so far proven unsuccessful. These factors should be considered when reviewing impacts that use this tool.

7.1.1 Updates to Formal Rebuilding Programs and Annual Catch Limits

7.1.1.1 Formal Rebuilding Programs

7.1.1.1.1 Georges Bank Winter Flounder Rebuilding Strategy
7.1.1.1.1.1 Option 1: No Action

XXX

7.1.1.1.1.2 Option 2: Revised Rebuilding Strategy for Georges Bank Winter Flounder

XXX

7.1.1.1.2 Southern New England/Mid-Atlantic Yellowtail Flounder Rebuilding Strategy
7.1.1.1.2.1 Option 1: No Action

XXX

7.1.1.1.2.2 Option 2: Revised Rebuilding Strategy for Southern New England/Mid-Atlantic Yellowtail Flounder

XXX

7.1.1.1.3 Witch Flounder Rebuilding Strategy
7.1.1.1.3.1 Option 1: No Action

XXX

7.1.1.1.3.2 Option 2: Revised Rebuilding Strategy for Witch Flounder

XXX

7.1.1.1.4 Northern Windowpane Flounder Rebuilding Strategy
7.1.1.1.4.1 Option 1: No Action

XXX

7.1.1.1.4.2 Option 2: Revised Rebuilding Strategy for Northern Windowpane Flounder

XXX

7.1.1.1.5 Ocean Pout Rebuilding Strategy
7.1.1.1.5.1 Option 1: No Action

XXX

7.1.1.1.5.2 Option 2: Revised Rebuilding Strategy for Ocean Pout

XXX

7.1.1.2 Annual Catch Limits

7.1.1.2.1 Option 1: No Action

Impacts on regulated groundfish
Under Option 1/No Action, the ACLs specified for FY 2019 would be unchanged from those adopted through FW57. There would be no changes to the specifications for FY 2019 – FY 2020 and default specifications would be set for EGB cod for the first three months of FY 2019. Under Option 1/No Action, there would be no FY 2019 quotas specified for the transboundary Georges Bank stocks of GB cod, GB haddock and GB yellowtail flounder, which are managed through the US/CA Resource Sharing Understanding. These quotas are specified annually.

Under Option 1/No Action, the directed groundfish fishery would be expected to operate in all broad stock areas through July 31, 2019. As of August 1, 2019, EGB cod would not have ACLs specified. In the absence of EGB cod specifications, commercial groundfish vessels would not be allowed to fish in the EGB management area without an allocation. It is anticipated that Option 1/No Action would result in minimal changes in fishing effort during the first three months of the fishing year. After July 31, 2019, Option 1/No Action would be expected to reduce commercial groundfish fishing effort in the EGB management area. Without specification of an ACL, a catch would not be allocated to the commercial groundfish fishery (sectors or common pool vessels) and targeted groundfish fishing activity would not occur for these stocks. Catches would not be eliminated because there would probably be incidental catches or bycatch from other fisheries. AMs in the multispecies fishery would be maintained but are expected to have a low probability of being triggered without allocations.

In addition to the lack of targeted groundfish fishing activity on EGB cod without ACLs, certain provisions of the sector management system probably would constrain fishing even for stocks with an ACL. Current management measures require that a sector stop fishing in a stock area if it does not have ACE for a stock. Fishing can continue on stocks for which the sector continues to have ACE only if the sector can demonstrate it would not catch the ACE-limited stock. What these provisions mean is that in most cases

there would be little opportunity for sector vessels to fish on stocks in EGB that have an ACL under Option 1/No Action, and so most groundfish fishing activity would not occur on EGB.

As a result, in general Option 1/No Action would be expected to have positive biological impacts compared to the alternative specifications under Option 2. The default specifications for EGB cod would continue to allow fishing for the first three months of the fishing year, but after that, directed fishing effort and biological impacts on regulated groundfish species would decline for stocks managed or located in that area. As a result, in general Option 1/No Action would be expected to result in positive biological impacts compared to Option 2.

Impacts on other species
Option 1/No Action is expected to have low positive indirect effects on non-groundfish species such as monkfish, dogfish, skates, and Atlantic sea scallops that are captured incidentally during groundfish trips. Indirect effects are generally likely to be beneficial given the expected reduced groundfish fishing activity. Catches of other species that occur on groundfish trips would decline as a result. There are only limited opportunities for groundfish vessels to target other stocks in other fisheries, so the shifting of effort into other fisheries is not likely to occur on a large scale. These other fisheries will also have ACLs and AMs so while such effort shifts may have economic effects the biological impacts should not be negative. Considering the differences between the ACLs of Option 1/No Action and Option 2, the fishing mortality on other stocks that are caught incidentally during groundfish trips would probably be lower under Option 1/No Action.

Lastly, sub-ACLs are designed to limit the incidental catch of GOM and GB haddock by mid-water trawl (MWT) herring fisheries, and exceeding the allocations results in triggering AMs in-season. No Action for GOM haddock and GB haddock would maintain the current sub-ACLs. Sub-ACLs for GOM haddock would decrease slightly and for GB haddock would increase under Option 2. Since the No Action sub-ACL for GB haddock is much less than Option 2, this increases the likelihood that the sub-ACL for GB haddock would be exceeded, and the in-season AM would be triggered. An in-season closure of the herring fishery would reduce fishing mortality of Atlantic herring, which would have low positive biological benefits for the Atlantic herring stock.

7.1.1.2.2 Option 2: Revised Annual Catch Limit Specifications

Impacts on regulated groundfish

Option 2 would reflect the results of the 2018 Transboundary Resource Assessment Committee (TRAC) stock assessments for EGB cod, EGB haddock, and GB yellowtail flounder. Option 2 would adopt new ABCs that are consistent with the best available science, as required by the M-S Act, for GB yellowtail flounder. Option 2 would also specify total allowable catches (TACs) for the U.S./Canada Management Area for FY2019.

GB Yellowtail Flounder
The TRAC met July 10-12, 2018 in Woods Hole, Massachusetts, US to conduct assessments for EGB cod, EGB haddock, and GB yellowtail flounder.

The 2018 TRAC stock assessment results for GB yellowtail flounder indicate low stock biomass and poor productivity, with low recent recruitment in all three surveys (Northeast Fisheries Science Center, NEFSC, fall and NEFSC spring and Department of Fisheries and Oceans, DFO, winter). The Total Allowable Catch (TAC) has been reduced substantially in recent years due to declining estimates of absolute biomass in the

survey, and recent catch continues to be low relative to the low quotas. Combined Canada and US catches in 2017 were 95 mt. Survey biomass has continued to decline to low levels for the past five years, despite reductions in catch to historical low amounts. Although the relative exploitation rate (i.e., catch/survey biomass) remains low, catch curve analyses indicated declining but high total mortality rates (Z above 1 for most years).

To generate catch advice, an empirical approach based on survey catches developed during the 2014 Georges Bank Yellowtail Flounder Diagnostic and Empirical Approach Benchmark and updated during the 2017 TRAC intersessional was applied[1]. The 2018 TRAC recommended an upper bound of 6% on the exploitation rate for catch advice, resulting in 68mt for 2019.

The Groundfish Plan Development Team (PDT) concluded that estimating the sources of mortality for GB yellowtail flounder remains an uncertainty. Some sources of uncertainty with respect to fishing mortality could include unknown discarding or changes in gear selectivity by age. TRAC analysis of catch curves from the three trawl surveys indicate that total mortality (Sinclair Z) on GB yellowtail flounder declined in recent years but remains high (Z above 1 for most years). Total mortality may still be high, but it has recently declined in two of the three surveys (NMFS fall and spring). The PDT discussed that given the low relative exploitation rates observed on this stock in recent years, it appears that natural mortality has increased to high levels. However, the driver(s) of natural mortality are uncertain. High natural mortality could be due to some combination of resource and environmental/ecosystem issues such as predator and prey dynamics, climate change leading to changes in thermal conditions, or loss of suitable habitat. An alternative explanation is that the distribution of the stock has changed (e.g., migrated to deeper water), which has altered its availability to the trawl surveys and fishery.

Figure 1 summarizes the catch performance of GB yellowtail flounder. Figure 2 displays the ratio of US discards to US landings of GB yellowtail flounder. In 2014 and 2017, US discards were greater than US landings (i.e., ratio >1). The scallop fishery had access to the Closed Area II rotational management area in both years, which led to the increase in the magnitude of yellowtail flounder discards.

[1] The 2017 TRAC consensus was to change survey catchability from 0.37 to 0.31 and to use wing width instead of door width to compute the swept area of a tow based on the three working papers discussed during the intersessional. Under these assumptions average survey biomass is approximately three times higher, but the trend does not change.

Figure 1 - Catch performance for Georges Bank yellowtail flounder including: catches from CY 2005- CY 2017 and historical ABCs since FY 2010. Overfishing status in the terminal year of the assessment indicated on the x-axis (Yes = overfishing, No= not overfishing, and unknown = unknown overfishing status).

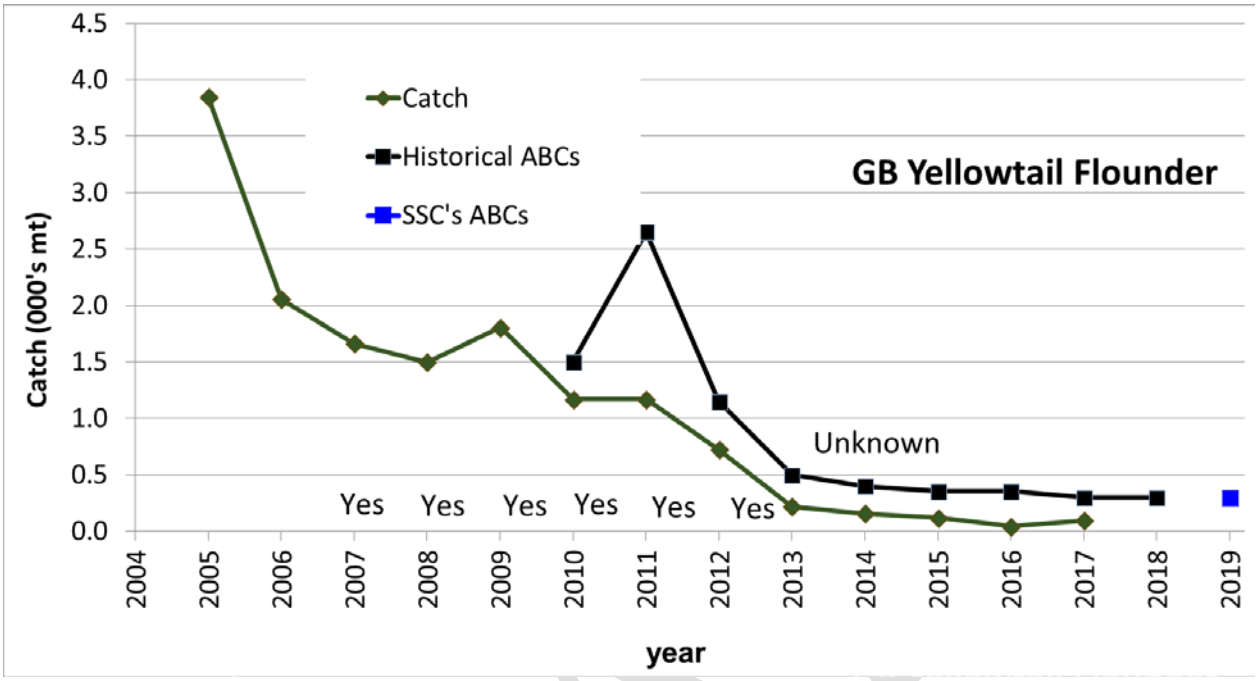
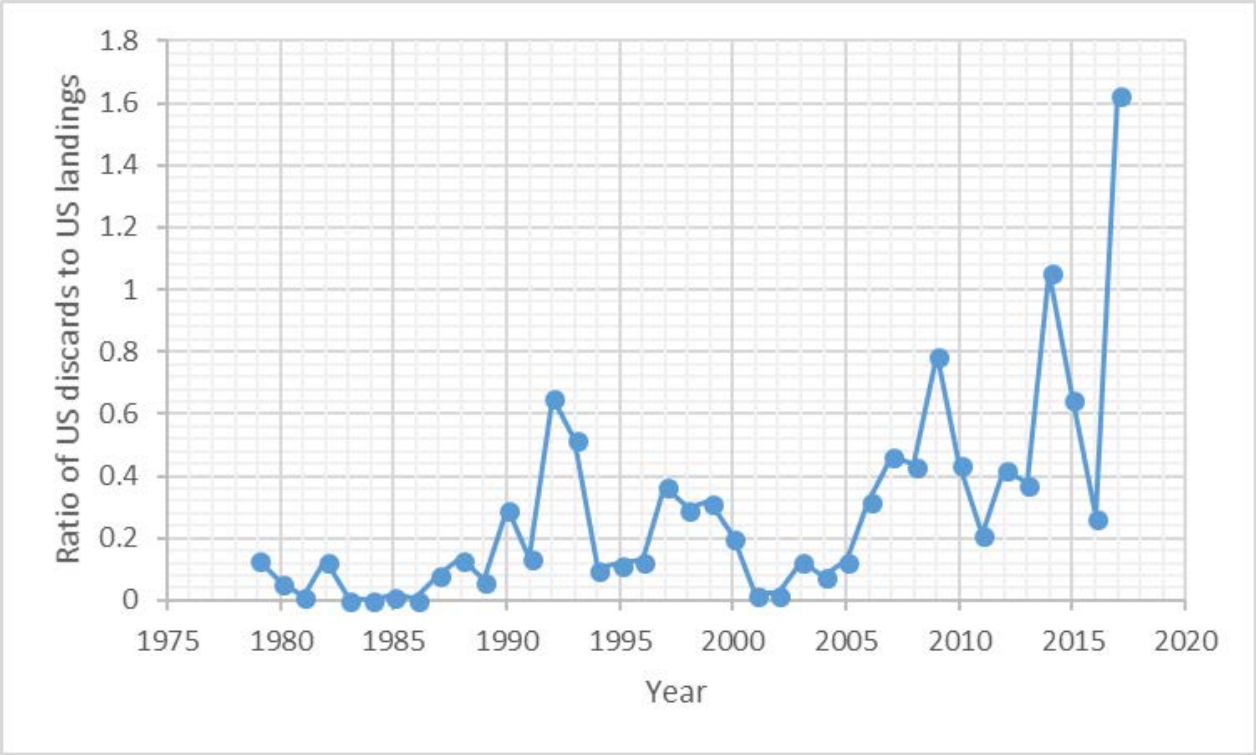


Figure 2 – Ratio of US discards to US landings of Georges Bank yellowtail flounder, 1979-2017. Source: DRAFT Stock Assessment of Georges Bank Yellowtail Flounder for 2018, TRAC, Table 1, pp. 9.



Option 2 would set GB yellowtail flounder specifications FY 2019- FY 2020 as indicated in [insert option 2, specs alternative Table XX ref]. At its meeting on August 15, 2018, the Scientific and Statistical Committee determined the ABC for the GB yellowtail flounder stock should not exceed 162mt for FY2019 and FY2020, with the expectation that the FY2020 catch specifications will be revisited and possibly adjusted following the 2019 TRAC assessment. OFL for the stock remains unknown. The SSC reaffirmed the previous recommendation that the Council continue to work toward the development of a control rule for GB yellowtail flounder (and other "empirical approach" stocks as an extension). See Appendix I for a summary of the SSC meeting and calculation for the ABC recommendation.

Under No Action/Option 1 and Option 2, total ABCs for GB cod and GB haddock for FY2019 and FY2020 would remain unchanged from those specified in FW57. However, under Option 2, the total ABC for GB yellowtail flounder would be approximately a 50 percent decline from the ABC specified in FY57. Relative to FY2018, Option 2 would increase FY 2019 ACLs for GB cod and GB haddock. There would be decreases in FY 2019 ACLs GB yellowtail flounder. Relative to Option 1/No Action, Option 2 would increase ACLs for GB cod and GB haddock and decrease ACLs for GB yellowtail flounder from those under Option 1/No Action. For these reasons under Option 2, low negative impacts are likely when compared with Option 1/No Action and relative to FY 2018.

Overview of Scallop FW30 and Projected Catches of Groundfish Stocks for FY 2019
The final Council preferred alternative for scallop fishery specifications in FY 2019 is anticipated to XXX

Scallop Framework Adjustment 30
Framework 30 considered a range of allocations for FY 2019 fishery specifications including XXX

[Table: Scallop PDT's projected catches on groundfish stocks for 2019]

Impacts on other species
In general, the specification of groundfish ABCs and ACLs by this option would not be expected to have direct or indirect impacts on most other species. Other species are caught on groundfish fishing trips and the ABCs/ACLs could indirectly affect species if they result in changes in groundfish fishing activity. When compared to Option 1/No Action, Option 2 would be expected to result in increased groundfish fishing effort and as a result catches of other species would be expected to be greater. This would be expected to result in increased fishing mortality rates for those species when compared to the No Action alternative. Species such as monkfish, skates, and spiny dogfish are among those most likely to be affected. All of these species are subject to management controls, and it is not likely that fishing mortality will exceed targets. Indeed, when compared to recent years, the increases in some groundfish ABCs/ACLs as proposed in this action would be expected to result in increased catches of other species.

The ABCs and ACLs under Option 2 include specification of sub-ACLs for other fisheries.

Sub-ACLs are designed to limit the incidental catch of yellowtail flounder and windowpane flounder by the scallop fishery. Exceeding catch limits may trigger accountability measures for the scallop fishery. A comparison of the Option 2 specifications (Table XX) and the Scallop PDT's estimates of projected catch by the scallop fishery (Table XX) indicates that scallop fishery catches are projected to be for:

- SNE/MA yellowtail flounder XXX than the sub-ACL.
- GB yellowtail flounder XXX than the sub-ACL.
- Southern (SNE/MAB) windowpane flounder
- Northern (GOM/GB) windowpane flounder XXX than the sub-ACL.

The overall impact of Option 2 ABCs and ACLs are likely to be XXX with respect to the Atlantic sea scallop resource.

In addition, sub-ACLs are designed to limit the incidental catch of GB yellowtail flounder by small-mesh fisheries, and exceeding the allocations results in triggering AMs in subsequent years. The accountability measure requires vessels to fish an approved selective trawl gear that reduces the catch of flatfish in the GB yellowtail flounder stock area. As small-mesh species can be effectively prosecuted using modified trawl gear, it is difficult to predict if groundfish sub-ACLs may affect fishing mortality and stock size of species that are targeted using small-mesh trawl gear (e.g., whiting and squid). The overall impact of Option 2 ABCs and ACLs are likely to be low positive to negligible with respect to the squid and whiting resources on Georges Bank.

Sub-ACLs are designed to limit the incidental catch of GOM and GB haddock by mid-water trawl (MWT) herring fisheries, and exceeding the allocations results in triggering AMs in-season. When compared to No Action/Option 1, Option 2 for GOM haddock may slightly reduce fishing mortality of Atlantic herring which would have low positive biological benefits for the Atlantic herring stock. When compared to No Action/Option 1, Option 2 for GB haddock may increase fishing mortality of Atlantic herring which would have low negative biological benefits for the Atlantic herring stock.

7.1.2 Fishery Program Administration

7.1.2.1 Minimum Fish Size Exemptions for Vessels Fishing in NAFO Regulatory Area

Brief overview of requirements to fish in the NAFO area

The principle species managed by NAFO are Atlantic cod, yellowtail flounder, witch flounder, Acadian redfish, American plaice, Greenland halibut, white hake, capelin, shrimp, skates, and *Illex* squid. NAFO specifies conservation measures for fisheries on these species occurring in its Regulatory Area, including TACs for these managed species that are allocated among NAFO Contracting Parties. The United States is a Contracting Party to NAFO. As a Contracting Party within NAFO, the United States may be allocated catch quotas or effort allocations for certain species in specific areas within the NAFO Regulatory Area and may participate in fisheries for other species for which we have not received a specific quota. For most stocks for which the United States does not receive a specific allocation, an open allocation, known as the ''Others'' allocation under the Convention, is shared access between all NAFO Contracting Parties.

U.S. applicant vessels must be in possession of, or obtain, a valid HSFCA permit, which is available from GARFO. All permitted vessels must comply with any conditions of this permit and all applicable provisions of the Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries and the Conservation and Enforcement Measures (CEM). NMFS can impose additional permit conditions that ensure compliance with the NAFO Convention and the CEM, the Magnuson-Stevens Fishery Conservation and Management Act and any other applicable law. The CEM provisions include, but are not limited to:

- Maintaining a fishing logbook with NAFO-designated entries (Annex II.A and Article 28);
- Adhering to NAFO hail system requirements (Annexes II.D and II.F; Article 28; Article 30 part B);
- Carrying an approved onboard observer for each trip consistent with requirements of Article 30 part A;
- Maintaining and using a functioning, autonomous vessel monitoring system authorized by issuance of the HSFCA permit as required by Articles 29 and 30; and
- Complying with all relevant NAFO CEM requirements, including minimum fish sizes, gear, bycatch retention, and per-tow move on provisions for exceeding bycatch limits in any one haul/set.

Further details regarding U.S. and NAFO requirements are available from the GARFO, and can also be found in the 2018 NAFO CEM (*https://www.nafo.int/Fisheries/Conservation*). Vessels issued valid HSFCA permits under 50 CFR part 300 are exempt from certain domestic fisheries regulations governing fisheries in the Northeast United States found in 50 CFR 648. Specifically, vessels are exempt from the Northeast multispecies and monkfish permit, mesh size, effort control, and possession limit restrictions (§§ 648.4, 648.80, 648.82, 648.86, 648.87, 648.91, 648.92, and 648.94), while transiting the U.S. exclusive economic zone with multispecies and/or monkfish on board the vessel, or landing multispecies and/or monkfish in U.S. ports that were caught while fishing in the NAFO Regulatory Area. These exemptions are conditional on the following requirements: The vessel operator has a letter of authorization issued by the Regional Administrator on board the vessel; for the duration of the trip, the vessel fishes, except for transiting purposes, exclusively in the NAFO Regulatory Area and does not harvest fish in, or possess fish harvested in, or from, the U.S. EEZ; when transiting the U.S. EEZ, all gear is properly stowed and not available for immediate use as defined under § 648.2; and the vessel operator complies with the provisions, conditions, and restrictions specified on the HSFCA permit and all NAFO CEM while fishing in the NAFO Regulatory Area.

Species that overlap the Northeast Multispecies (Groundfish) FMP and NAFO waters

Several of the same species are managed in Federal and NAFO waters, including cod, haddock, pollock, witch flounder, yellowtail flounder, American plaice, winter flounder, redfish, and white hake. Table 2 provides a comparison of the commercial minimum fish by species and Federal and NAFO waters, some of which have no minimum size under NAFO regulations.

Table 2- Comparison between Federal and NAFO waters of commercial minimum fish size by species.

	Minimum Size	
Species	**Federal Waters**	**NAFO waters** Gilled and gutted fish whether or not skinned; fresh or chilled, frozen, or salted. Fish size refers to fork length for Atlantic cod; whole length for other species.
Cod	19 in. (48.3 cm)	41 cm (whole) 27 cm (head off) 22 cm (head and tail off) 27 cm/25 cm (head off and split)** **Lower size for green salted fish.
Haddock	16 in. (40.6 cm)	No minimum size
Pollock	19 in. (48.3 cm)	No minimum size
Witch flounder	13 in. (33 cm)	No minimum size
Yellowtail flounder	12 in. (30.5 cm)	25 cm (whole) 19 cm (head off) 15 cm (head and tail off)
American plaice	12 in. (30.5 cm)	25 cm (whole) 19 cm (head off) 15 cm (head and tail off)
Atlantic halibut	41 in. (104.1 cm)	Not applicable
Winter flounder	12 in. (30.5 cm)	No minimum size
Redfish	7 in. (17.8 cm)	No minimum size
White hake	No minimum size	No minimum size

Summary of recent allocations

The U.S. has allocation for redfish, ilex, and yellowtail flounder and also shares allocations with other NAFO Contracting Parties (Table 3). Access is on a first come, first served basis and directed fishing is prohibited by NAFO when the ‘‘Others’’ quota for a particular stock has been fully harvested. The draft alternatives provide options for the Committee to consider with respect to exempting U.S. vessels fishing exclusively in the NAFO regulated area from Northeast Multispecies minimum fish sizes.

Table 3- Summary of 2018 possible U.S. quota access by species in NAFO waters (US Allocation and NAFO "Others" Allocations).

Species	NAFO Division	US Allocation	Others Quota
Cod	3M		45
Redfish	3LN		85
	3M	69	*NA*
	3O		100
Yellowtail flounder	3LNO	1,000 *Sub-allocation from Canada*	*NA*
Witch flounder	3NO		11
White hake	3NO		59
Skates	3LNO		258
Illex squid	Squid 3_4 (Sub-Areas 3+4)	453	*NA*

7.1.2.1.1.1 Option 1: No Action

Impacts on regulated groundfish
Under Option 1/No Action, vessels fishing in the NAFO fishery would continue to be prohibited from possessing any fish, including parts of fish, that do not meet the minimum fish size in the domestic fishery. The NAFO stocks are distinct from the stocks managed by the Northeast Multispecies FMP. Therefore, harvest of those stocks does not have a biological impact on U.S. stocks. As a result, Option 1/No Action would be expected to result in negligible biological impacts on regulated groundfish compared to Option 2.

Impacts on other species
Because the NAFO stocks are distinct from the stocks managed in U.S. waters, Option 1/No Action would be expected to result in negligible biological impacts on other species compared to Option 2.

7.1.2.1.1.2 Option 2: Exempt vessels fishing in the NAFO Regulatory Area from Northeast Multispecies FMP commercial minimum fish sizes

Impacts on regulated groundfish
Under Option 2, U.S. vessels fishing exclusively in the NAFO Regulatory Area would be exempt from the domestic fishery minimum sizes, and instead would be required to land fish that met the NAFO minimum sizes as specified in the NAFO Conservation and Enforcement Measures (CEM). The NAFO stocks are distinct from the stocks managed by the Northeast Multispecies Fishery Management Plan. Therefore, harvest of those stocks does not have a biological impact on U.S. stocks. As a result, Option 2 would be expected to result in negligible biological impacts on regulated groundfish compared to Option 1/No Action.

Impacts on other species

Because the NAFO stocks are distinct from the stocks managed in U.S. waters, Option 2 would be expected to result in negligible biological impacts compared on other species to Option 1/No Action.

7.1.3 Commercial Fishery Measures

7.1.3.1 Atlantic Sea Scallop Fishery AM Implementation Policy

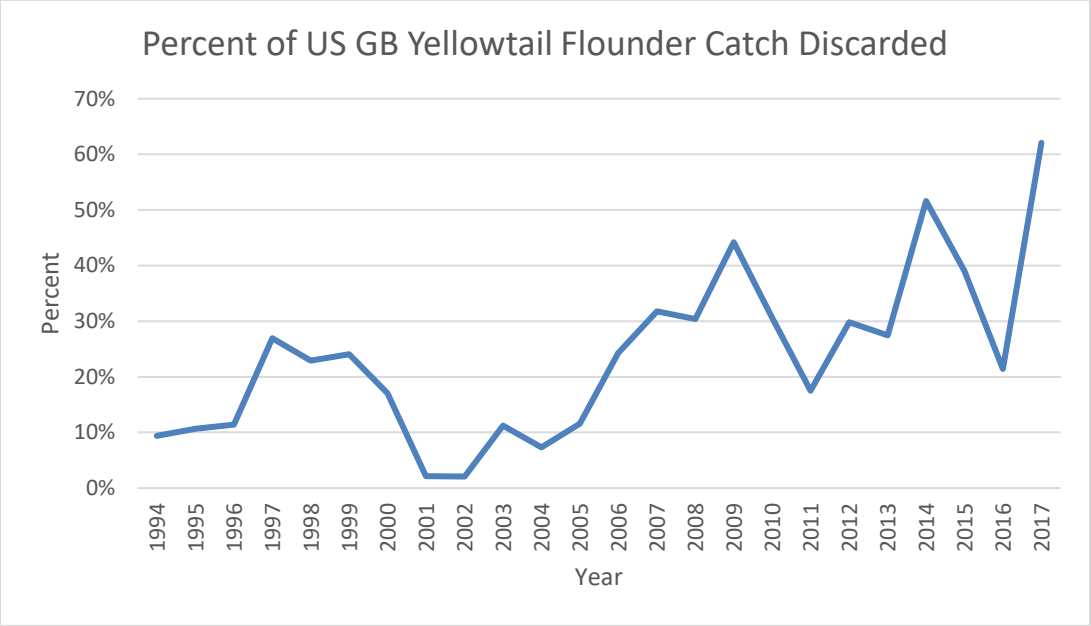
GB yellowtail flounder is jointly managed by the US and Canada. Relative to quotas, recent low catches of GB yellowtail flounder have occurred in the groundfish fishery and scallop fishery (Table 2Table 4). Recent low catches might not be indicative of biomass, and changes in catch might not accurately track changes in biomass well for this stock.

Table 4- Recent Georges Bank yellowtail flounder TACs and scallop fishery sub-ACLs and catches. Values shown in metric tons (mt).

	Total Shared TAC – US & CA (mt)	US Share	US TAC (mt)	US TAC Caught	Scallop sub-ACL (mt)	Scallop catch (mt)	Scallop ACL Caught
FY2011	2,650	55%	1,458	76%	200.8	83.9	42%
FY2012	1,150	49%	564	68%	156.9	164	105%
FY2013	500	43%	215	43%	41.5	37.5	90%
FY2014*	400	82%	328	37%	50.9	59	116%
FY2015*	354	70%	248	28%	38	29.7	78%
FY2016*	354	76%	269	11%	42	2.1	5%
FY2017*	300	69%	207	41%	32	52.6	164%
* Indicates that retention of yellowtail flounder was prohibited for scallop fishery							

In 2017, US discards of GB yellowtail flounder (57 mt) were greater than US landings (35 mt), with a declining trend in proportion of GB yellowtail flounder catch landed in recent years based (Figure 3). The majority of discards were from the scallop fishery.

Figure 3- Percentage of US Georges Bank yellowtail flounder discarded, 1994-2017. Source: 2018 stock assessment of Georges Bank yellowtail flounder, TRAC, Table 1, pp. 9-10 .



Several reasons for low catches are examined in this section. Low catches may be due to a combination of factors including, but not limited to; the reduction in groundfish effort, the loss of market for GB yellowtail flounder due to low quotas, poor stock condition, spatial shifts in stock distribution, avoidance of the stock through use of separator gear, and difficulty finding GB yellowtail flounder. Recent low catches of GB yellowtail flounder by the U.S. groundfish fishery may be influenced by other management measures. For example, the large Northern Windowpane Flounder AM was in place in FY 2014, FY 2015, and part of FY 2017 due to overages of Northern windowpane flounder catch limits. The AM requires the use of approved gear (i.e., haddock separator trawl, rope separator trawl, or Ruhle trawl) while fishing in the gear restricted area to reduce catch of flatfish. The northern windowpane flounder AM area is located west and southwest of Closed Area II, which has historically been an important fishing ground for yellowtail flounder. However, in 2017, only 20 percent of groundfish trips to offshore GB used selective gear (Figure 4) and zero vessels landed yellowtail flounder from trips to offshore GB using selective gear. In addition, the Canadian fleet does not target GB yellowtail flounder and vessels may only use haddock separator gear in the US/CA management area. Recent increased use of separator gear on Georges Bank by the US groundfish fishery are reflective of the AM (Figure 4- Figure 6).

Figure 4- Proportion of sector groundfish trips into offshore Georges Bank by trawl gear type (OTR = Ruhle trawl, OHS =Haddock Separator, and OTF = Bottom-Otter Trawl) with trip counts, FY2011-May FY2016. Source: GARFO/DMIS.

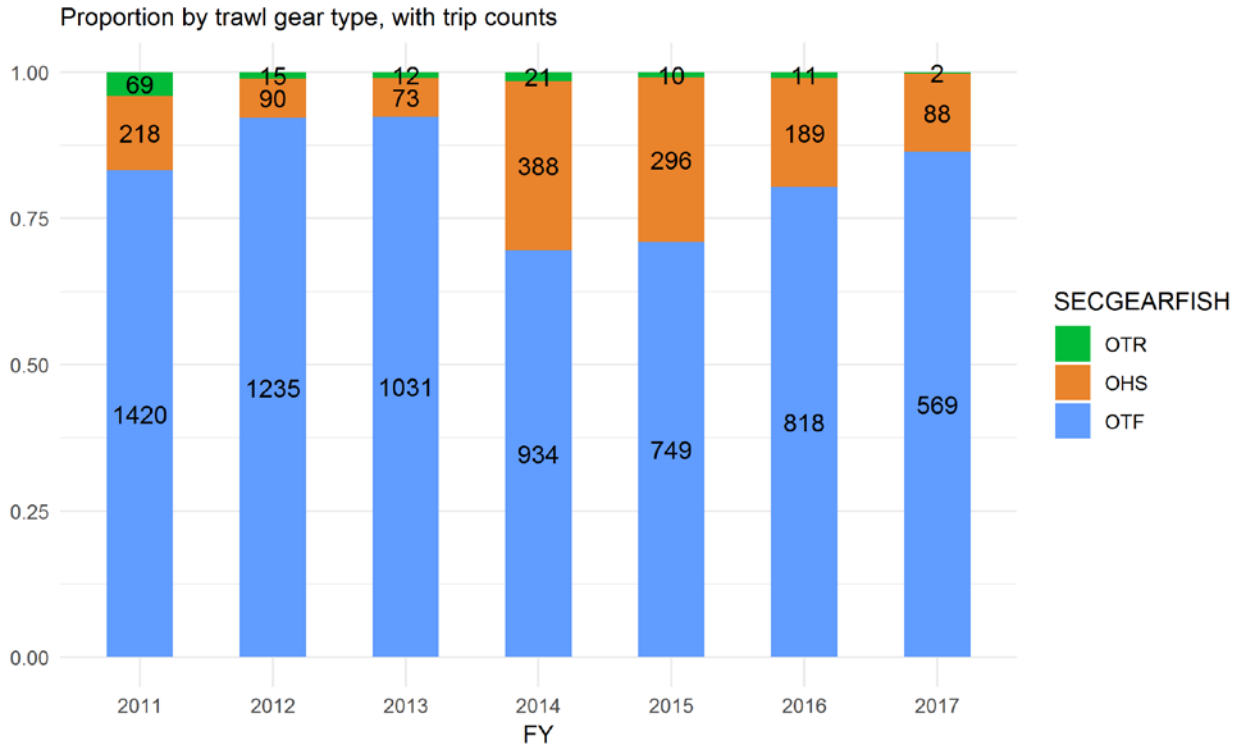


Figure 5- Proportion of vessels taking sector groundfish trips into offshore Georges Bank by trawl gear type (Rhule trawl, Haddock Separator, and Bottom-Otter Trawl) with vessel counts, FY2011-May FY2016.

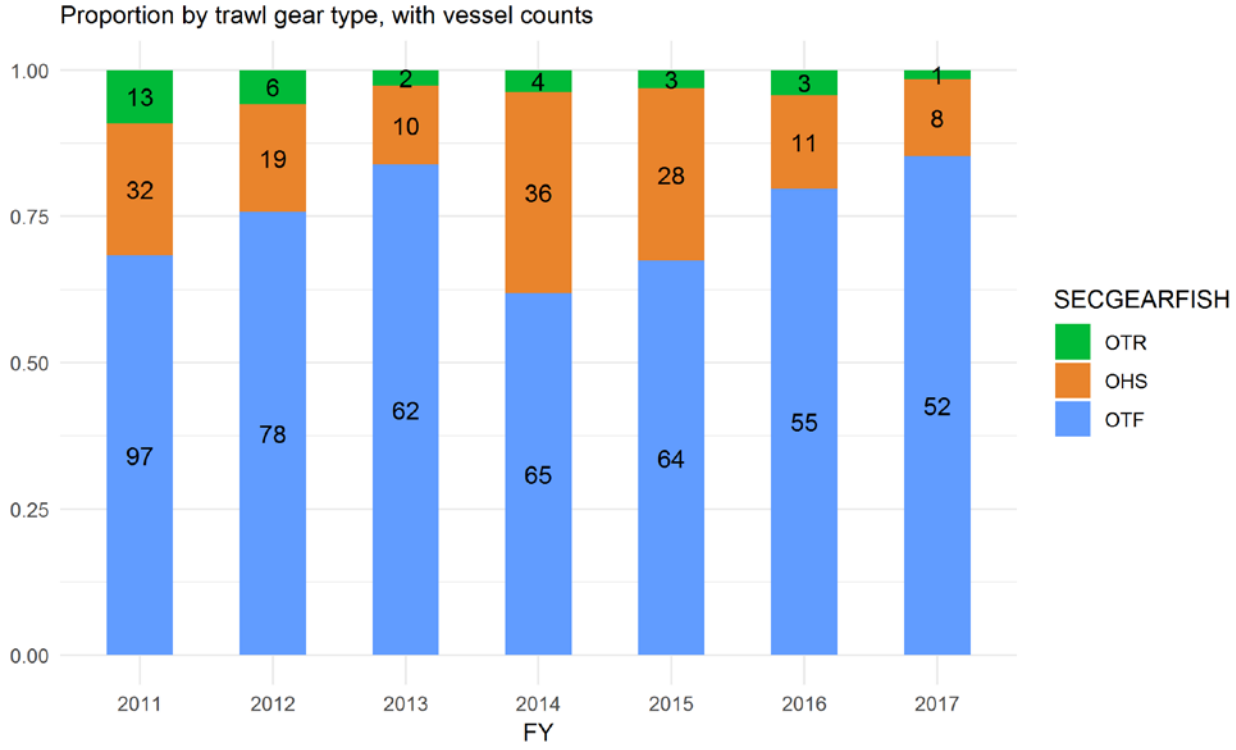
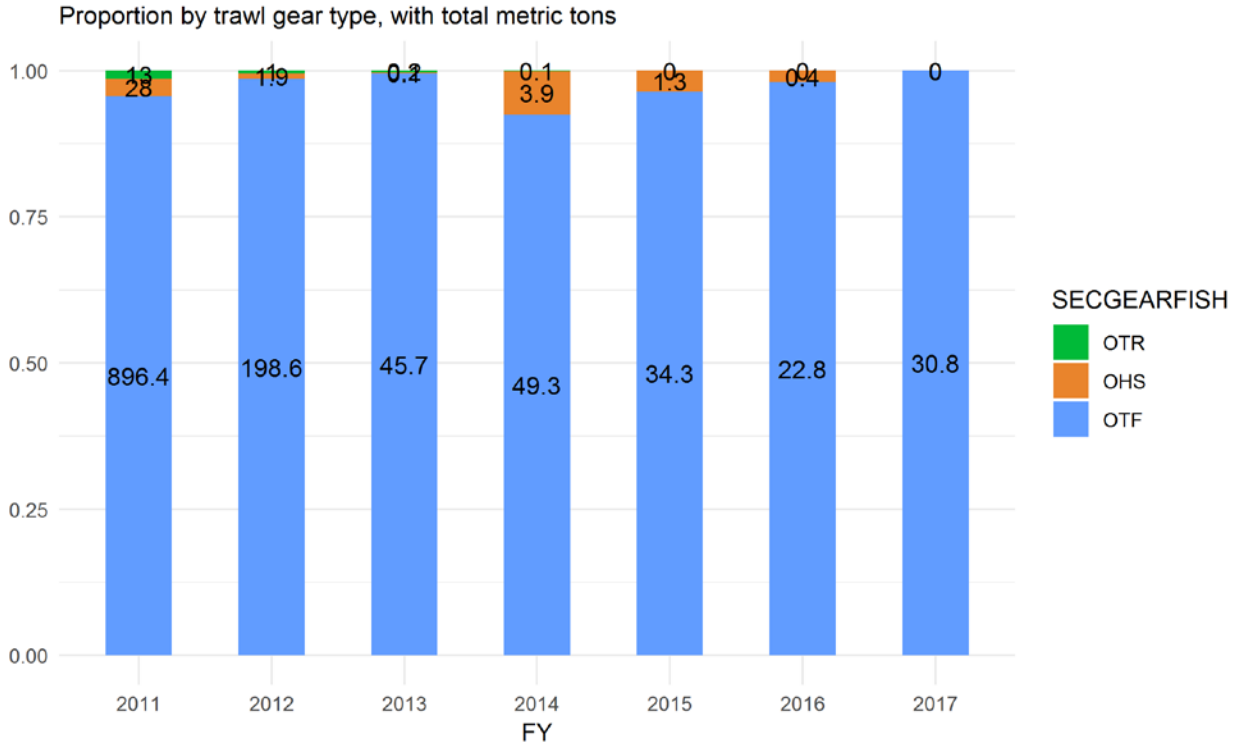


Figure 6- Proportion of sector Georges Bank yellowtail flounder landing by trawl gear type (Rhule trawl, Haddock Separator, and Bottom-Otter Trawl) with landings totals, FY2011-May FY2016. Source: GARFO/DMIS.



Further, recent low quotas for GB yellowtail flounder have not appeared to constrain the U.S. groundfish fishery in its access to other abundant stocks like GB haddock (Table 5). Otherwise, GB yellowtail flounder would be expected to be caught at a higher rate. US landings of GB yellowtail flounder were 38.4mt in 2015, 23.9mt in 2016, and 31.0mt in 2017 (sources: GARFO year-end reports). Quotas lower than recent catches may constrain access to other species (i.e., haddock, scallops). The following includes additional information and analysis.

Table 5- Recent Georges Bank haddock groundfish fishery ACLs, catch, and percent of ACL caught. Values shown in metric tons (mt).

Fishing Year	Groundfish sub-ACL (mt)	Catch (mt)	Percent of ACL Caught
2011	30,580	3,841	13%
2012	27,438	1,198	4%
2013	26,196	2,978	11%
2014	17,171	5,449	32%
2015	21,759	5,075	23%
2016	51,667	4,391	8%
2017	52,620	4,091	8%

Scallop Fishery Allocations of GB yellowtail

The scallop fishery is currently allocated 16% of the US share of the GB yellowtail acceptable biological catch (see Groundfish FW57). The scallop fishery's annual catch limit (ACL) is based on historic catch and reflects a reduction for management uncertainty. Both the allocation and in-season catch accounting of the scallop fishery GB yellowtail sub-ACL are based on the scallop fishing year, which, as of 2018, runs from April 1st to March 31st (previously March 1st to February 28th). In years where NMFS projects that less than 90% of the scallop fishery GB yellowtail sub-ACL will be caught, the agency may initiate an allocation transfer from the scallop fishery to the groundfish fishery. In FY2015, NMFS transferred 7.9 mt of GB yellowtail from the scallop fishery to the groundfish fishery (21% of the FY2015 scallop fishery GB yellowtail sub-ACL). NMFS initiated a transfer again in FY2016, where 39.8 mt of GB yellowtail from the scallop fishery sub-ACL was shifted to the groundfish fishery (~95% of the FY2016 scallop fishery GB yellowtail sub-ACL). The scallop fishery did not have access to Closed Area II access area (CAII) in either FY2015 or FY2016 (Figure 7, Table 8).

Rotational Management within the GB Yellowtail Stock Area and Recent Catch

The scallop fishery is managed through a rotational area management system. This system directs effort throughout the resource at varying levels using the following types of spatial management areas: 1) "open area", where scallop vessels may operate using Days-At-Sea (limited access vessels) or IFQ (limited access general category vessels); 2) permanent closures, where scallop fishing is prohibited to reduce impacts on essential fish habitat and(or) groundfish mortality; 3) scallop rotational areas, where scallop fishing is either temporarily prohibited or periodically allowed at controlled levels of access, depending on the condition of the resource inside their boundaries. Generally, scallop rotational areas (also known as "access areas") will 'close' to protect small scallops, and 'open' when scallops are large enough to be harvested by a commercial dredge (i.e. 4" ring). The duration of a closure depends on many factors, but typically will range from two to three years. Rotational closures are also utilized on a seasonal basis to mitigate impacts on non-target stocks.

Closed Area II Access Area (CAII AA) is a scallop rotational area located within the GB yellowtail stock boundary (Figure 8). Along with being productive scallop grounds, CAII AA and areas directly south and west have also historically supported yellowtail flounder. In light of this overlap, bycatch of GB yellowtail in the scallop fishery is highly variable and dependent on access to CAIII AA. Table 8

describes allocations to the limited access fishery and the level of effort directed to Closed Area II from FY2011 to FY2018.

Since FY2013, CAII AA has been seasonally closed from August 15th to November 15th to reduce bycatch of GB yellowtail by the scallop fishery. In FY2017, RSA compensation fishing was prohibited in CAII AA to further reduce bycatch of GB yellowtail by the scallop fishery. The open-area directly south of CAII AA (known as 'CAII extension') was closed from FY2015 to FY2017 to protect a set of small scallops and was reverted back to open-area in FY2018. CAII extension has historically had relatively higher bycatch than other Georges Bank open area, meaning the three years of closure likely reduced overall bycatch by the scallop fishery.

Following partial approval and implementation of the Omnibus Habitat Amendment 2, Scallop Framework 29 re-opened the Closed Area I North HMA to scallop fishing as part of Closed Area I Access Area. The configuration of the Closed Area I Access Area in FW29 is bisected by the GB yellowtail stock boundary, with the eastern portion of the area covering SRA 522.

Table 6. Recent GB yellowtail TACs and scallop fishery sub-ACLs and catches. Values are shown in metric tons (mt).

FY	Total Shared TAC	US % Share	US TAC (mt)	% US TAC Caught	Scallop sub-ACL	Scallop catch	% Scallop ACL Caught
FY2010	1,500	64%	1,200	68%	146	17.6	12.1%
FY2011	2,650	55%	1,458	76%	200.8	83.9	41.8%
FY2012	1,150	49%	564	68%	156.9	164.0	104.5%
FY2013	500	43%	215	43%	41.5	37.5	90.4%
FY2014*	400	82%	328	37%	50.9	59.0	115.9%
FY2015*	354	70%	248	28%	38	29.7	78.1%
FY2016*	354	76%	269	12%	42	2.1	5.0%
FY2017*	300	69%	207	44%	32	52.6	164.3%
FY2018*	300	71%	213	n/a	33	n/a	n/a
* retention of GB yellowtail prohibited for scallop fishery							

Figure 7. Scallop fishery GB yellowtail sub-ACLs, estimated catch, and Closed Area II allocations for fishing years 2011 – 2017.

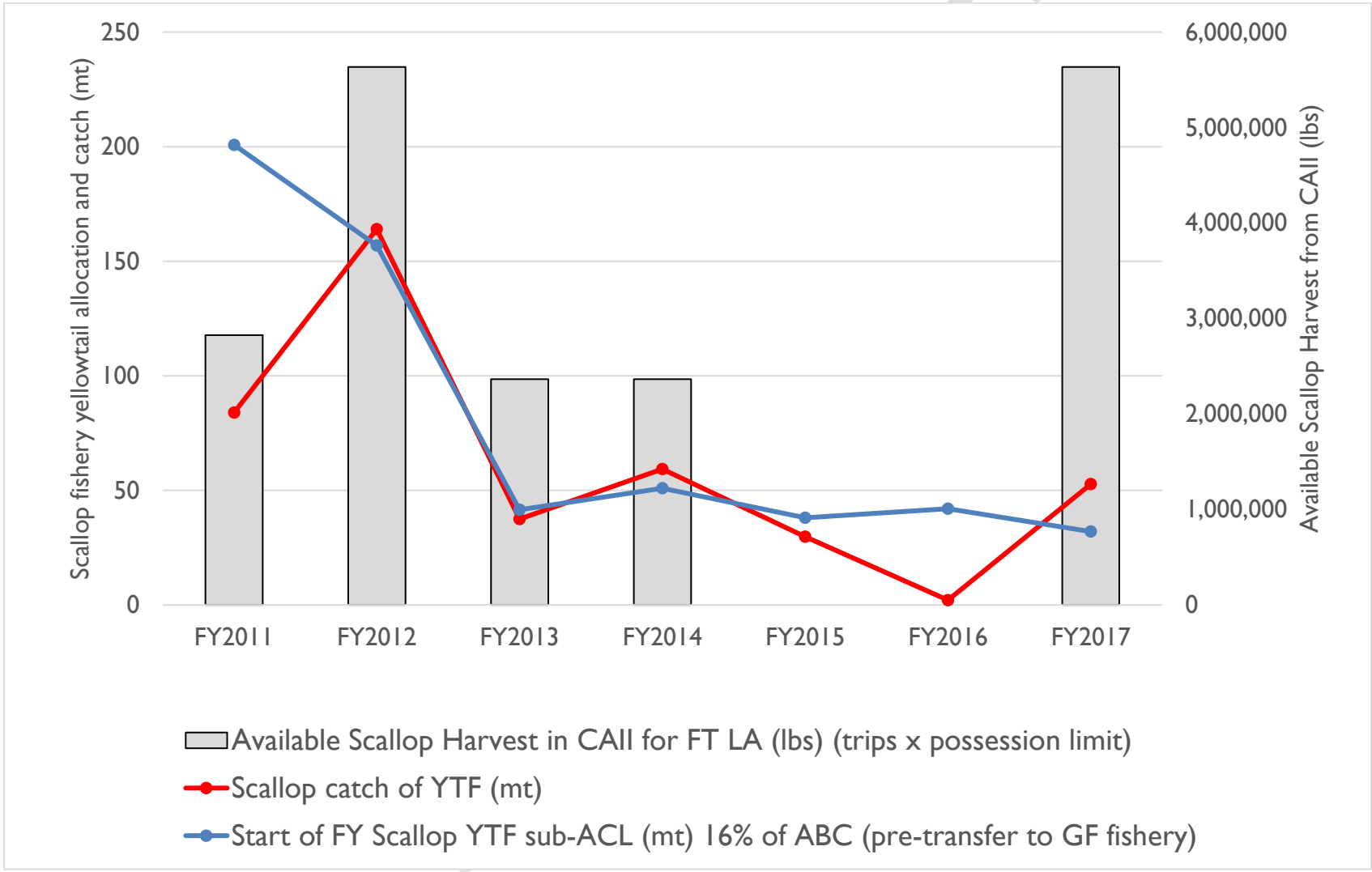
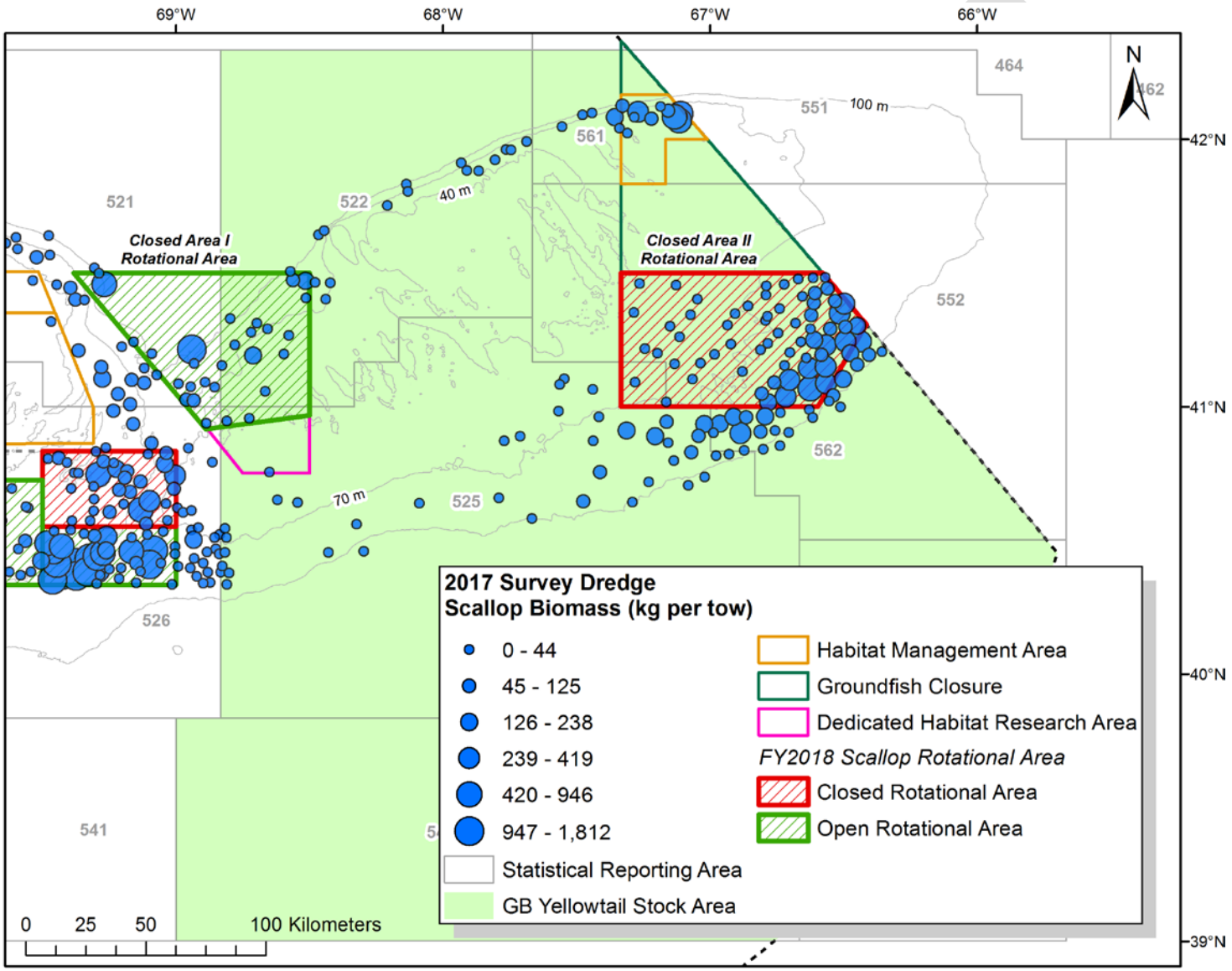


Figure 8. Scallop catch per tow from 2017 dredge surveys (VIMS/NMFS), FY2018 rotational management areas, habitat closures, and statistical reporting areas relative to the GB yellowtail stock area. Rotational areas within the GB yellowtail stock area are labeled in italics.



Since FY2011, scallop fishery catch of GB yellowtail has ranged from a high of 164 mt in FY2012 to a low of 2.1 mt in FY2016 (note that there was no access to CAII or CAII extension for FY 2016; Table 8 and Figure 7). The Scallop PDT projects GB yellowtail bycatch associated with the preferred scallop allocation alternatives for each Framework.

Framework 28 to the Scallop FMP directed limited access trips to Closed Area II access area in FY2017; the projection of GB yellowtail bycatch for FY2017 was 63.2 mt (~50 mt was projected for CAII and ~13 mt was projected for the remaining open areas of GB), while the actual catch was 52.6 mt, meaning the GB yellowtail sub-ACL allocated to the scallop fishery for FY2017 (32 mt) was exceeded. Table 7 summarizes monthly GB yellowtail catch by the scallop fishery in FY2017 (source: GARFO data monitoring). FY2017 yellowtail catch was highest in June and July because overall effort in CAII AA increased compared to other months. Table 7 illustrates the correlation between access to CAII AA and yellowtail bycatch, in that approximately 98.5% of FY2017 yellowtail catch came from CAII AA while less than 2% came from Georges Bank open areas.

Under Framework 29, FY2018 spatial management turned Closed Area II extension into part of the open area and did not include access to Closed Area II access area. The Scallop PDT projected catch of GB yellowtail by the scallop fishery would be approximately 11.7 mt in FY2018, which is approximately 78% less than realized yellowtail catch in FY2017. In-season estimates of yellowtail catch for FY2018 to date have not yet been made available by GARFO.

Table 7. Estimated scallop fishery catch of GB yellowtail by area, component, and month for FY2017 (source: GARFO quota monitoring page, https://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/atlanticseascallop.html).

Date	Limited Access Fleet*		LAGC IFQ Fleet	Monthly total catch (lb)	Cumulative catch (lb)	Percent of sub-ACL (70,584 lb)
	Open Areas	Closed Area II	Open Areas			
17-Mar	68	-	2	69	69	0.1
17-Apr		2,251		2,251	2,320	3.3
17-May		15,196		15,196	17,517	24.8
17-Jun		35,740		35,740	53,257	75.5
17-Jul	159	31,382		31,541	84,798	120.2
17-Aug	888	13,590		14,477	99,275	140.7
17-Sep	356	-		356	99,630	141.2
17-Oct	182	-		182	99,813	141.5
17-Nov		2,045		2,045	101,858	144.4
17-Dec		9,834		9,834	111,692	158.3
18-Jan		2,349		2,349	114,042	161.7
18-Feb		1,864		1,864	115,906	164.3
18-Mar			-	0	115,906	164.3
Total	**1,652**	**114,252**	**2**	**115,906**		

Table 8. Full-time limited access scallop fishery allocations by FY and recent schedule of CAII access.

FY	Action	LA DAS (Full Time)	FT LA AA trips	CA II AA	Notes re: CA II AA and other management
2011	FW22	32	4 (2 MA)	0.5 trips (157 vessels; 18K lbs/trip)	10% access area bycatch cap; GB stock-wide monitoring of YT sub- ACL; Bycatch Avoidance Program CAI and CAII
2012	FW22	34	4	1 trip (313 vessels; 18K lbs/trip)	GB stock-wide monitoring of YT sub-ACL; Bycatch Avoidance Program CAI and CAII
2013	FW24	33	2	182 trips (13K lbs/trip)	Seasonal closure of CAII Aug 15 – Nov 15; GB stock-wide monitoring of YT sub-ACL; Bycatch Avoidance Program CAII
2014	FW25	31	2	197 trips (12K lbs/trip)	16% GB YT sub-ACL; YT landings prohibited; Seasonal closure of CAII Aug 15 – Nov 15; GB stock-wide monitoring of YT sub-ACL; Bycatch Avoidance Program CAII
2015	FW26	30.86	51K lbs to MAAA	Closed	In-season transfer to groundfish fishery (7.9 mt).
2016	FW27	34.55	3 (51K lbs to MAAA)	Closed	'CAII Extension' closure of open areas to protect small scallops; In- season transfer to groundfish fishery (39.8 mt)
2017	FW28	30.41	4 (18K each)	1 trip (313 vessels; 18k lbs trip)	'CAII Extension' closure of open areas to protect small scallops; no RSA compensation fishing in CAII; seasonal closure of CAII Aug 15—Nov 15; Bycatch Avoidance Program CAII
2018	FW29	24.00	6 (18K each)	Closed	'CAII extension' reverted back to open area. Reactive AM for GB yellowtail changed from time-area closure to gear modification in CAII.

Accountability Measures

The Scallop FMP has several measures in place to proactively mitigate bycatch of GB yellowtail and other non-target flatfish species. Through scallop Framework 26, the Council approved measures that restrict the maximum number of rows in the dredge apron to 7 in all areas as shorter aprons have been shown to reduce flatfish bycatch and improve fish escapement (see Scallop FW 24, Appendix IV). Part of the rationale for this 7-row restriction was to reduce flatfish bycatch and prevent sub-ACLs from being exceeded and triggering reactive accountability measures. The 7-row apron restriction has been in effect since FY2015. The PDT also notes that the fishery-wide requirement of a minimum 10" twine top (Amendment 10, 2004) improved the escapement of yellowtail flounder.

Through Framework 29 (FY2018), the Council modified the reactive accountability measure (AM) for GB yellowtail. Prior to FY2018, this AM was a time-area closure of statistical reporting area 562 (i.e. CAII and surrounds), with the duration of the time-area closure being dependent on the percent of the sub-ACL overage. As of FY2018, the AM was changed to a reactive gear restricted area (GRA), with the duration of the GRA being dependent on the magnitude of the sub-ACL overage. When the AM is in place, vessels fishing in CAII and CAII extension are required to fish a dredge with: 1) a dredge bag with a maximum of 5-rows in the apron; and 2) a 1.5:1 maximum hanging ratio. This gear-modification was based on a study conducted by the Coonamessett Farm Foundation (2012 final report here), which suggested the 5-row apron modified dredge bag reduces bycatch of yellowtail and other species of flatfish compared to a standard dredge bag configuration used by industry.

In November 2016, the Council voted to allow a "temporary exception with a two-year sunset provision, to the scallop fishery AM implementation policy for the GB yellowtail flounder stock" under Groundfish Framework 56. NMFS approved this measure in the final rule to Framework 56 in July of 2017, retroactive to the start of the groundfish fishing year (May 1, 2017). Under this temporary exception, the only criteria used to determine if an AM would be implemented for GB yellowtail is if the scallop fishery exceeds their sub-ACL and the overall ACL for the stock is also exceeded in fishing years 2017 and 2018. This exception removes the AM trigger criteria of the scallop fishery exceeding the GB yellowtail sub-ACL by 150% or more. The Council specifically noted that recent utilization of GB yellowtail by the groundfish fishery has been low due to low quotas. Beginning in FY2019, the standard policy for scallop fishery AM implementation will apply unless otherwise specified by the Council.

Recent Scallop Fishery VMS Effort

VMS data were used as a proxy of fishing effort for the scallop fishery in FY2018 to date (i.e. April 1 to September 14, 2018) (Figure 9), FY2017 (Figure 10), and FY2016 (Figure 11). A speed filter of 2 to 5 kts was applied to remove vessel activity that was likely a result of transiting to and from fishing grounds.

Overall scallop fishery effort (i.e. both in access areas and open areas) was noticeably more concentrated in 2017 (Figure 10) compared to FY2016 (Figure 11). This was especially true within the GB yellowtail stock area, where wide-spread open area effort along the 50-fathom contour on both the north and south sides of Georges Bank in FY2016 shifted to highly concentrated fishing in CAII AA (with the opening of the access area) and a small area of open bottom directly west of CAII extension in FY2017. Over the first three months of FY2018, scallop effort within the GB yellowtail stock area appears to be concentrated in what was formerly the Closed Area II Extension rotational closure (re-opened after being closed for 2 years), and the northeast corners of the Closed Area I Access Area.

Figure 9. Scallop fishery VMS hours fished for FY2018 (April 1st through September 14th).

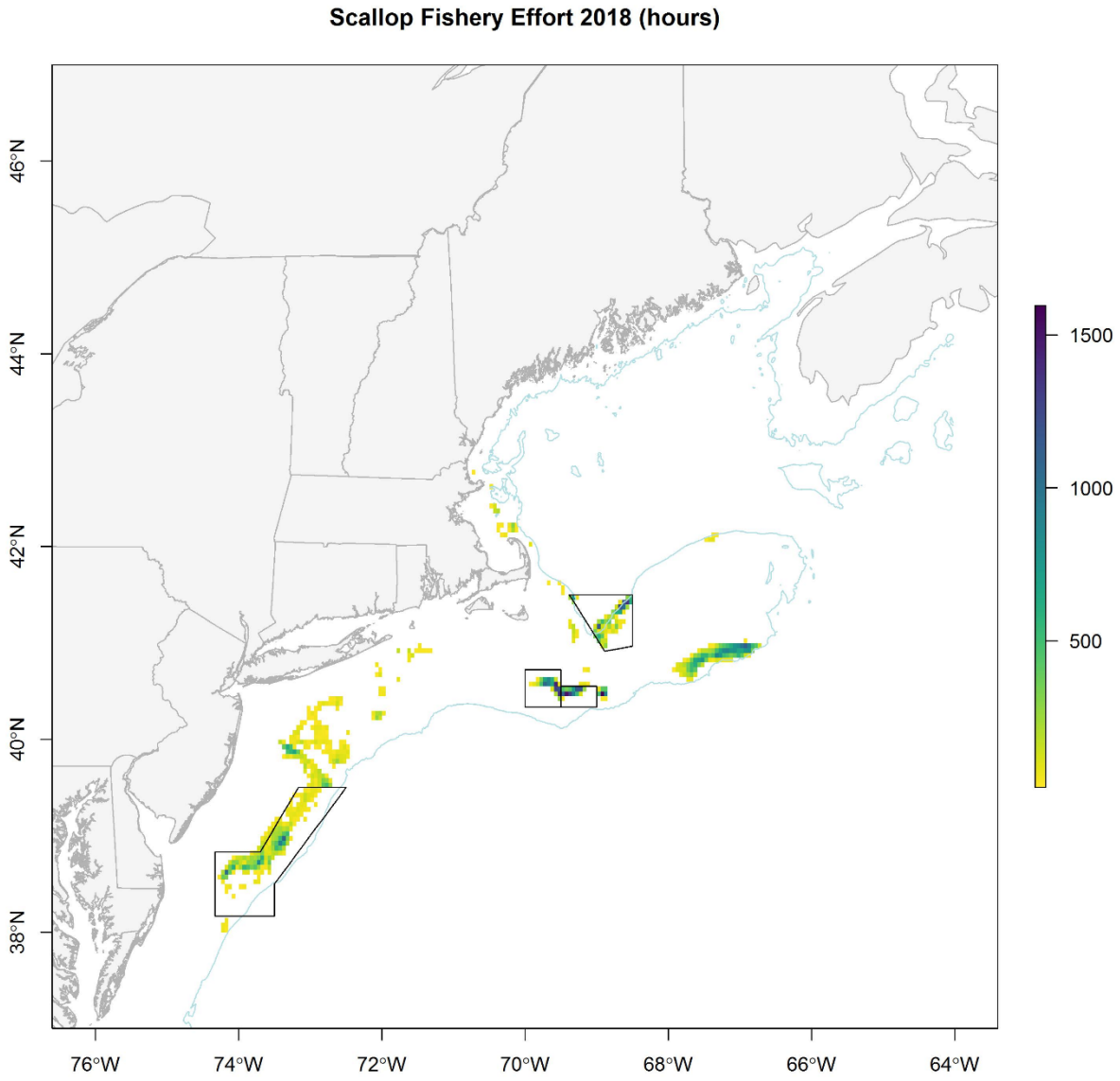


Figure 10. Scallop fishery VMS hours fished for FY2017.

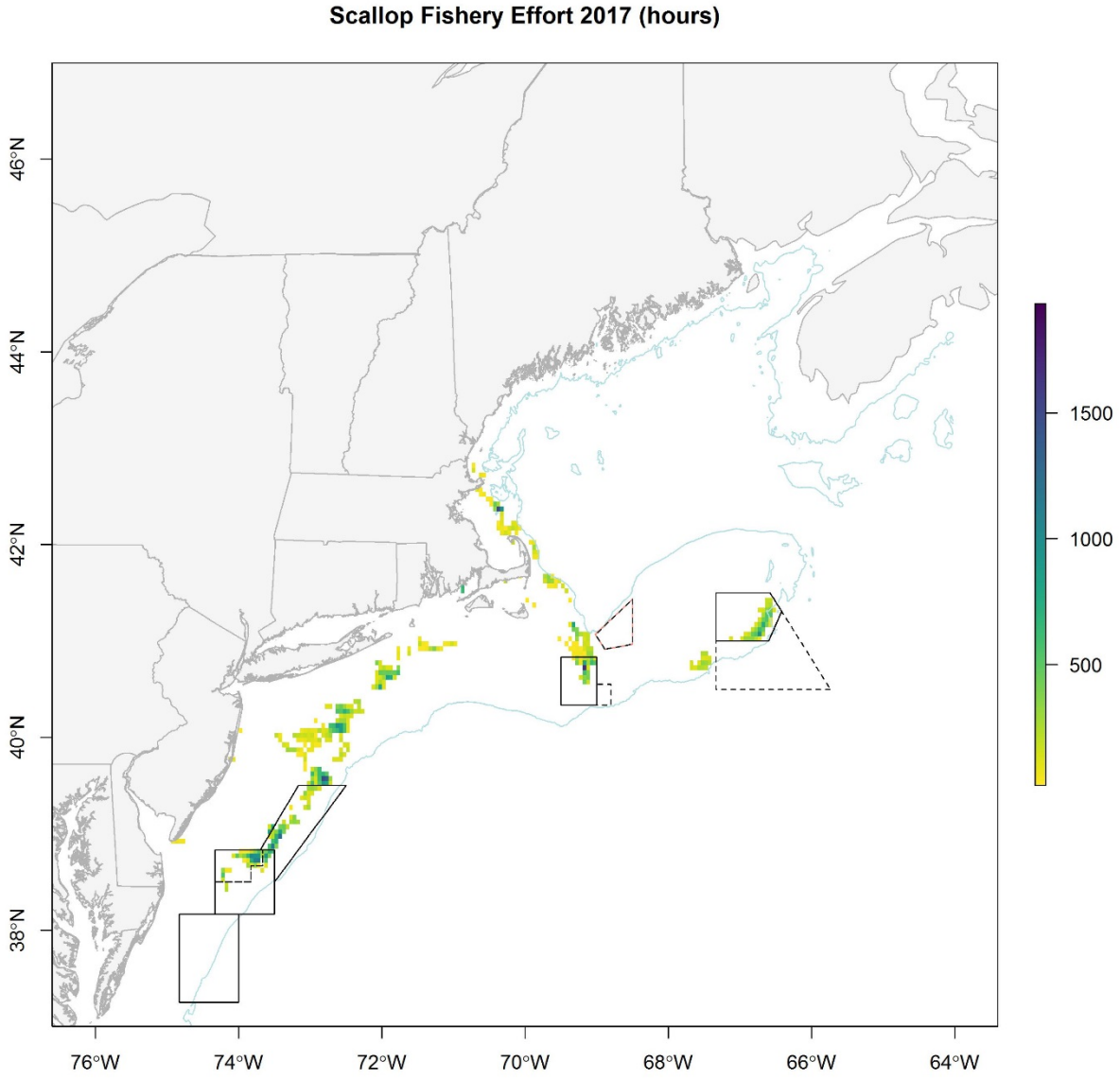
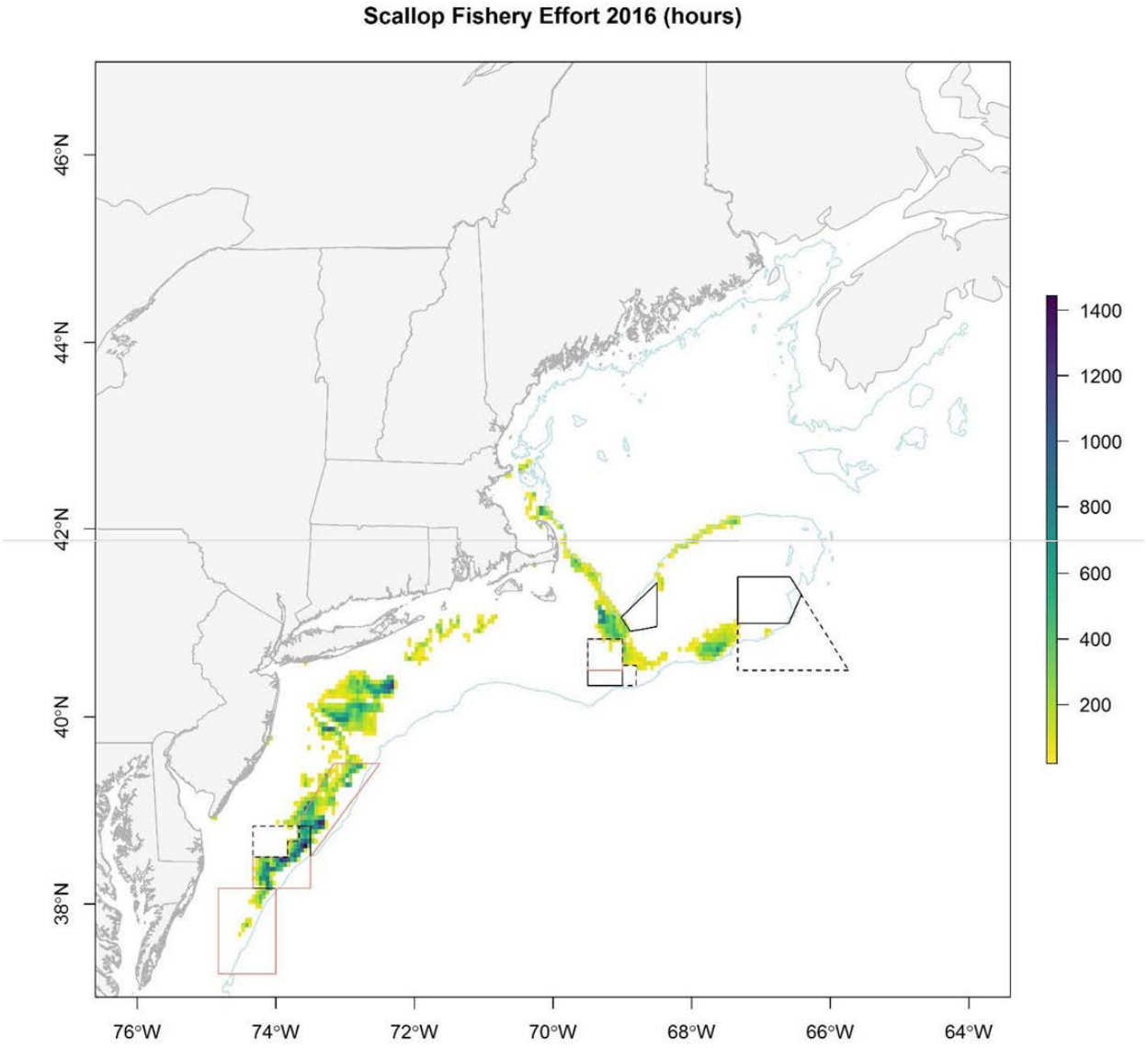


Figure 11. Scallop fishery VMS hours fished for FY2016.



Amendment 15 established seasonal closures for the scallop fishery as the AM for the GB yellowtail flounder sub-ACL in 2011. The closures would be in statistical area 562, which extends from just west of Closed Area II (CAII), through that closed area, and to the southeast of that closed area. In addition, a small portion of statistical area 525 within the CAII access area would also be closed. FW 23 revised the areas to occur in the months with the highest yellowtail flounder catch rates, rather than consecutive months beginning at the start of the fishing year. In 2018, FW 29 further revised the AM from closed areas to gear restricted areas. The new AM requires the use of the AM gear (i.e., scallop dredge with modified apron) in the GB AM Area for a period of time based on the corresponding percent overage of the GB yellowtail flounder sub-ACL (Table 9).

Table 9- GB Yellowtail Flounder AM Duration.

Percent Overage of sub-ACL	Duration of Gear Restriction
20 or Less	November 15 through December 31.
Greater than 20	April through March (year-round).

The rationale for the change in AM was that it would have the greatest reduction of GB yellowtail flounder bycatch, but not impact the months when scallop landings are highest from the CA II AA.

7.1.3.1.1.1 Option 1: No Action

Impacts on regulated groundfish species
The AM policy established in FW 47 for the scallop fishery would remain unchanged. Option 1/No Action would continue to provide positive impacts on all groundfish stocks for which the scallop fishery has a sub-ACL.

Impacts on other species
Option 1/No Action is not expected to have direct or indirect impacts on non-groundfish species such as monkfish, dogfish, and skates. The impacts of Option 1/No Action on Atlantic sea scallops would be negligible if the scallop fishery was able to continue to prosecute their fishery in times/areas outside of the AM areas.

7.1.3.1.1.2 Option 2: Temporary change to the Atlantic sea scallop fishery AM implementation policy for the GB yellowtail flounder stock

Option 2 would allow for a temporary change to the AM implementation policy for the GB yellowtail flounder stock so that the only criteria to determine if an AM would be implemented would be if the scallop fishery exceeds its sub-ACL for a stock and the overall ACL is also exceeded. This measure includes a 2-year "sunset" provision. Therefore, if the measure was implemented in FY 2019, the temporary change to AM policy would only apply for FY 2019 and FY 2020 catches. The underlying policy would apply (i.e., as described under No Action) in FY2021 and beyond.

Impacts on regulated groundfish species
The information provided on the scallop and groundfish fisheries suggests that the GB yellowtail flounder ACL is unlikely to be exceeded in FY 2018 or FY2019. The Scallop PDT's projected catch estimate for 2019 suggests that the catches would be XX the sub-ACL with the AM likely to be triggered under No Action . Relative to No Action/Option 1, Sub-Option A would be low negative to neutral impacts on regulated groundfish species depending on the magnitude of all fisheries catches and the fact that this option would be put in place as a temporary measure for two years (for catches occurring in FY 2019 and FY 2020).

Impacts on other species
Compared with No Action/Option 1, Option 2 is not expected to have direct or indirect impacts on non-groundfish species such as monkfish, dogfish, and skates. The impacts of Option 1/No Action or Option 2 on Atlantic sea scallops would be negligible if the scallop fishery was able to continue to prosecute their fishery in times/areas outside of the AM areas.

7.3 Impacts on Endangered and Other Protected Species

The FW 58 alternatives are evaluated for their impacts on species protected under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972. Section 6.5 of the Affected Environment Section contains a complete list of protected species (i.e., ESA listed and MMPA protected species) that inhabit the areas of operation for the Northeast multispecies fishery. This impact analysis considers how the fishery may overlap with protected species in time and space, as well as records of protected species interaction with particular gear types (e.g. gillnet, bottom otter trawl).

7.3.1 Updates to Formal Rebuilding Programs and Annual Catch Limits

7.3.1.1 Formal Rebuilding Programs

7.3.1.1.1 Georges Bank Winter Flounder Rebuilding Strategy
7.3.1.1.1.1 Option 1: No Action

XXX

7.3.1.1.1.2 Option 2: Revised Rebuilding Strategy for Georges Bank Winter Flounder

XXX

7.3.1.1.2 Southern New England/Mid-Atlantic Yellowtail Flounder Rebuilding Strategy
7.3.1.1.2.1 Option 1: No Action

XXX

7.3.1.1.2.2 Option 2: Revised Rebuilding Strategy for Southern New England/Mid-Atlantic Yellowtail Flounder

XXX

7.3.1.1.3 Witch Flounder Rebuilding Strategy
7.3.1.1.3.1 Option 1: No Action

XXX

7.3.1.1.3.2 Option 2: Revised Rebuilding Strategy for Witch Flounder

XXX

7.3.1.1.4 Northern Windowpane Flounder Rebuilding Strategy
7.3.1.1.4.1 Option 1: No Action

XXX

7.3.1.1.4.2 Option 2: Revised Rebuilding Strategy for Northern Windowpane Flounder

XXX

7.3.1.1.5 Ocean Pout Rebuilding Strategy
7.3.1.1.5.1 Option 1: No Action

XXX

7.3.1.1.5.2 Option 2: Revised Rebuilding Strategy for Ocean Pout

XXX

7.3.1.2 Annual Catch Limits

7.3.1.2.1 Option 1: No Action

Under the Option 1/No Action, the ACLs specified for FY 2019 would be unchanged from those adopted through FW 57. There would be no changes to the specifications for FY 2019 – FY 2020 (Table X). Default specifications would be in effect from May 1, 2019, to July 31, 2019, and would equal 35% of the FY 2018 catch limits, which would only be necessary for EGB cod and EGB haddock and would use FY 2018 catch limits as a basis for also adjusting GB cod and GB haddock for expected Canadian catches. There would be no FY 2019 quotas specified for the transboundary Georges Bank stocks (i.e. GB cod, GB haddock, GB yellowtail flounder), which are managed through the US/CA Resource Sharing Understanding. These quotas are specified annually.

Under Option 1/No Action, the directed groundfish fishery would be expected to operate in all broad stock areas through July 31, 2019; during this timeframe, minimal changes in fishing effort, relative to current operating conditions, are anticipated. However, on August 1, 2019, EGB cod and EGB haddock would not have ACLs specified. In the absence of stock specific specifications, commercial groundfish vessels would not be allowed to fish in the EGB management area without an allocation. As a result, after July 31, 2019, commercial groundfish fishing effort in the EGB management area is expected to be reduced. As all other stocks would have specifications that would not expire on July 31, 2019, and these specifications are not significantly different from those authorized over the last 5 or more years, significant changes in fishing effort would not be expected in all other broadstock areas though FY2019. Based on this information, fishing effort and behavior under the No Action is expected to remain similar to current operating conditions with the potential for effort to decline in the EGB management area after July 31, 2019.

Understanding expected fishing behavior/effort in a fishery informs potential interaction risks with protected species (ESA listed and MMPA protected species). Specifically, interaction risks with protected species are strongly associated with the amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases of any or all these factors. Taking into consideration the latter, as well as fishing behavior/effort under the No Action (Option 1), impacts of the No Action to protected species are provided below.

MMPA (Non-ESA listed) Protected Species Impacts

Impacts of the No Action on non-ESA listed marine mammals (i.e., species of cetaceans and pinnipeds) are somewhat uncertain as quantitative analysis has not been performed. However, we have considered, to the best of our ability, the most recent (2010-2015) information on non-ESA listed marine mammal interactions with commercial fisheries, of which, the groundfish fishery is a component (Hayes et al. 2017; Hayes et al. 2018). Aside from humpback whales, pilot whales, and several stocks of bottlenose dolphin, there has been no indication that takes of non-ESA listed species of marine mammals in commercial fisheries has gone above and beyond levels which would result in the inability of each species population to sustain itself (Hayes et al. 2017; Hayes et al. 2018). Specifically, aside from MMPA strategic stocks identified in Table X (i.e., humpback whales, pilot whales, and several stocks of bottlenose dolphin), potential biological removal (PBR) levels have not been exceeded for any of the non-ESA listed marine mammal species identified in section 6.4 (Hayes et al. 2017; Hayes et al. 2018). Although humpback whales, pilot whales, and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR level, take reduction strategies and/or plans have been implemented and are currently in place to reduce bycatch in the fisheries affecting these species (Atlantic Trawl Gear Take Reduction Strategy, Atlantic Large Whale Take Reduction Plan, Pelagic Longline Take Reduction Plan; Bottlenose Dolphin Take Reduction Plan; see sections 6.2.4.1.1 and 6.2.4.1.2 for additional information). Although the most recent information presented in Hayes et al. (2017) and Hayes et al. (2018) is a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and does not address the effects of the groundfish fishery specifically, the information does demonstrate that thus far, current management measures are keeping most marine mammal species below PBR; exceptions include marine mammal strategic stocks of: humpback whales, pilot whales and bottlenose dolphin stocks (Hayes et al. 2017; Hayes et al. 2018.

Based on the above information, and the fact that the groundfish fishery must comply with specific take reduction plans (i.e., HPTRP, the BDTRP, ALWTRP; see Section 6.5); and that voluntary measures exist that reduce serious injury and mortality to marine mammal species incidentally caught in trawl fisheries (see the Atlantic Trawl Gear Take Reduction Team), the No Action is expected to have low negative impacts on non-ESA listed species of marine mammal.

ESA Listed Species

The groundfish fishery is prosecuted primarily with bottom otter trawl and gillnet gear. As provided in Section 6.5, ESA listed species of whales, sea turtles, Atlantic sturgeon, and Atlantic salmon are vulnerable to interactions with these gear types, with interactions often resulting in the serious injury or mortality to the species. Based on this, the groundfish fishery is likely to result in some level of negative impacts to ESA listed species. Taking into consideration fishing behavior/effort under the No Action, as well the fact that interaction risks with protected species are strongly associated with the amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, we determined the level of negative impacts to ESA listed species to be low. Below, we provide support for this determination.

As provided above, the No Action alternative will set specifications for FY 2019 – FY 2020; these specifications would remain unchanged from those adopted in FW 57. As specifications under the No Action are no greater than those authorized over the last 5 or more years, resultant fishing behavior and effort in the groundfish fishery is expected to remain similar to what has been observed in the fishery over this timeframe. Specifically, the number of bottom trawls and gillnets, tow or soak times, and area fished are not expected to change significantly from current operating conditions. As noted above, interaction

risks with protected species are strongly associated with the amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases of any or all of these factors. Continuation of "status quo" fishing behavior/effort is not expected to change any of these operating conditions. Based on this, and the fact that the groundfish fishery must comply with the ALWTRP, the impacts of the No Action alternative on ESA listed species is expected to be low negative.

Overall Impacts to Protected Species

Based on the above protected species impacts analysis, overall impacts of Option 1 on protected species (ESA listed and MMPA protected) are expected to be low negative. Relative to Option 2, Option 1 may result in neutral to low positive impacts to protected species. Although Option 2 includes new U.S./Canada TACs, the total ACL for the majority of the stocks remains consistent with those provided in Option 1. All proposed ACLs are within the range of ACLs authorized within the fishery over the last 5 (or more) years. As a result, any changes in fishing effort or behavior between either Option are not expected to be significant. However, as Option 1 will not have specifications specified for EGB cod or haddock after July 31, 2019, some reduction in effort is possible in this management area. The latter potentially equates to less fishing time, and therefore, less gear being present in the water. As protected species (ESA listed and MMPA species) interactions with gear, regardless of listing status, is greatly influenced by the amount of gear, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, any decrease in either of these factors will reduce the potential for protected species interactions with gear. Based on this information, Option 1 may provide some benefit to protected species relative to Option 2.

7.3.1.2.2 Option 2: Revised Annual Catch Limit Specifications

Based on the most recent scientific data, Option 2 would adopt new specifications for groundfish stocks for FY 2019 – FY 2020 (see Table X). This measure includes the identification of ACLs, ABCs, and OFLs as required by the M-S Act and as implemented by Amendment 16, as well as adjustments to state and sub-ACL sub-components, and new U.S./Canada TACs.

Annual catch limits can be considered a proxy for relative fishing effort. Information on fishing effort in turn informs potential interaction risks to protected species. Specifically, interaction risks to protected species are associated with the amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, (i.e., components of fishing effort); however, this information is often unavailable. As a result, assessments of protected species interactions with an associated fishery are often dependent on looking at changes (if any) in ACL as a means to identify potential changes in fishing behavior/effort from one year to the next, and therefore, identification of new or additional interaction risks to a protected species. Under Option 2, in FY 2019, relative to the ACLs provided in FW 57, the ACL will remain unchanged for GB cod and GB haddock, and will be lower for GB yellowtail flounder; FY 2020 ACLs for GB cod and GB haddock will return to the same levels specified in Option 1, while GB yellowtail flounder will remain lower than those specified in Option 1. All other groundfish stocks will have specifications similar to those provided in Option 1 for FY 2019- FY 2020. Additionally, these proposed specifications under Option 2 are no greater than or are within the range of the specifications that have been authorized by the fishery over the last 5 or more years, and so resultant fishing behavior and effort in the groundfish fishery is expected to remain similar to what has been observed in the fishery over this timeframe. Specifically, the number of bottom trawls and gillnets, tow or soak times, and areas fished are not expected change significantly from current operating conditions. As noted above, interaction risks with protected species are strongly associated with the amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, with risk of an

interaction increasing with increases of any or all these factors. As Option 2 is not expected to change any of these operating conditions, and is not expected to result in significant changes in effort, increased interaction with protected species are not expected. Based on this, and the fact that the groundfish fishery must comply with the take reduction plans (i.e., HPTRP, the BDTRP, ALWTRP; see Section 6.5), impacts of Option 2 on protected species are expected to be similar to those provided in Option 1, low negative. Relative to Option 1, Option 2 is likely to result in neutral to negative impacts to protected species as there is the potential for a slight decrease in effort under Option 1 relative to Option 2.

7.3.2 Fishery Program Administration

7.3.2.1 Minimum Fish Size Exemptions for Vessels Fishing in NAFO Regulatory Area

7.3.2.1.1.1 Option 1: No Action

The No Action would maintain that U.S. vessels participating in the NAFO fishery would continue to be prohibited from possessing any fish, including parts of fish, that do not meet the minimum fish size in the domestic fishery (see section 7.1.2.1 for a description of the requirements for vessels to fish in the NAFO area). Option 1/No Action is administrative in nature and therefore, is not expected to have a direct impact on protected species because it does not, in and of itself, change fishing effort or fishing behavior. However, while this measure is administrative in nature, and may not directly impact protected species, indirectly, Option 1 may affect protected species as Option 1/No Action does inform fishing activity of U.S. vessels fishing in the NAFO Regulatory Area, and fishing activity may result in interactions with protected species. Option 1/No Action will not provide any incentive to increase effort or change fishing behavior of vessels fishing in the NAFO Regulatory Area in a manner that differs from how the fishery currently operates (e.g., no changes to gear soak/tow times, gear quantity, or area fished). Based on this, and the fact that interaction risks to protected species are strongly associated with amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases of any or all these factors, Option 1 is expected to result in neutral to low negative impacts to protected species. Relative to Option 2, Option 1 is expected to result in neutral to potentially negative impacts to protected species as there is no potential for effort to decrease under Option 1 as there is under Option 2.

7.3.2.1.1.2 Option 2: Exempt vessels fishing in the NAFO Regulatory Area from Northeast Multispecies FMP commercial minimum fish sizes

Option 2 would allow U.S. vessels fishing exclusively in the NAFO Regulatory Area to be exempt from the domestic fishery minimum sizes, and instead would be required to land fish that met the NAFO minimum sizes as specified in the NAFO Conservation and Enforcement Measures (CEM). A comparison of NAFO and domestic minimum fish sizes is shown in Table X. Similar to Option 1, exempting vessels fishing exclusively in the NAFO Regulatory Area from minimum fish sizes in the domestic fishery is administrative in nature, and is not expected to have a direct impact on protected species because it does not, in and of itself, change fishing effort or fishing behavior. However, indirectly, Option 2 may affect protected species as it has the potential to change fishing activity relative to current operating conditions. Specifically, exempting vessels fishing exclusively in the NAFO Regulatory Area from minimum fish sizes in the domestic fishery may provide an incentive to change fishing activity, as vessels would now be allowed to harvest fish that they currently cannot under the domestic minimum fish sizes. Allowing U.S. vessels to harvest fish using NAFO minimum sizes enables the United States to be better stewards of the NAFO resource by reducing discards that meet the NAFO size standards but are below the domestic minimum size. This has the potential to result in a decrease in fishing activity in the NAFO Regulatory Area, as vessels would be able to harvest fish that they previously were required to discard, which may

result in less overall fishing effort. As interaction risks with protected species are influenced by the amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, any decrease in either of these factors will reduce the potential for protected species interactions with gear. Therefore, Option 2 has the potential to reduce interaction risks for protected species in the NAFO Regulatory Area. There is also the potential that exempting vessels fishing exclusively in the NAFO Regulatory Area from minimum fish sizes in the domestic fishery may provide an incentive to increase fishing effort in the NAFO Regulatory Area. However, there is no data available to suggest whether fishing effort of vessels fishing in the NAFO Regulatory Area would be expected to increase or change significantly relative to current operating conditions, but it is expected that any changes in fishing effort would be negligible. Based on this, Option 2 is expected to have neutral to low negative impacts on protected species. Relative to Option 1, Option 2 is likely to result in neutral to potentially low positive impacts to protected species as there is the potential for a slight decrease in effort, compared to Option 1. Option 2 potentially equates to less fishing effort, and therefore, less gear being present in the water, although these differences may be negligible. Based on the above information, Option 2 may provide some benefit to protected species relative to Option 1.

7.3.3 Commercial Fishery Measures

7.3.3.1 Atlantic Sea Scallop Fishery AM Implementation Policy

7.3.3.1.1.1 Option 1: No Action

The No Action would maintain the AM policy established in FW 47 for the scallop fishery for the GB yellowtail flounder stock. Option 1/No Action will not provide any incentive to increase effort or change scallop or groundfish fishing behavior in a manner that differs from how the fishery currently operates. Based on this, the AM measure is not expected to impact protected resources. As provided in previous sections, interaction risks with protected species are strongly associated with amount of gear in the water, the time the gear is in the water (e.g., soak time, tow time), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases of any or all these factors. Fishing behavior/effort (e.g., gear quantity, soak/tow time, area fished) in the groundfish fishery is not expected to change from current operating conditions as a result of Option 1. Similarly, overall effort in the scallop fishery, relative to current operating conditions, is not expected to increase as a result of Option 1. Further, FW 29 to the Scallop FMP implemented changes to the scallop fishery flatfish AMs so that the AMs are now a gear modification requiring use of a modified dredge, in place of time-area closures (NEFMC 2018). Thus, there is not an expected shift in scallop fishing effort under this Option, but if any resultant shift in scallop fishing effort should occur as a result of this Option, any shift in effort will be to areas which have been considered by NMFS in its assessment of fishery effects to protected species (NMFS 2012; Hayes et al. 2018; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html). With effort in either fishery not expected to increase or change significantly relative to current operating conditions, gear quantity, soak/tow time, and areas fished are also not expected to change. Based on this, new or elevated (e.g., more gear, longer tow times) interaction risks to protected species (MMPA protected and ESA listed) are not expected. Relative to Option 2, impacts of Option 1 on protected species are neutral.

7.3.3.1.1.2 Option 2: Temporary change to the Atlantic sea scallop fishery AM implementation policy for the GB yellowtail flounder stock

Option 2 would allow for a temporary change to the AM implementation policy for the GB yellowtail flounder stock so that the only criteria to determine if an AM would be implemented would be if the scallop fishery exceeds the sub-ACL for a stock and the overall ACL is also exceeded. This measure would include a 2-year “sunset” provision. Therefore, if the measure is implemented in FY 2019, the

exception to the AM policy would only be available for FY 2019 and FY 2020, and in FY 2021 and beyond the underlying policy would apply (i.e., as described under No Action).

Although the proposed changes will allow more flexibility and possibly less constraints on the scallop fishery, similar to Option 1, Option 2 will not provide any incentive to increase effort or change scallop fishing behavior in a manner that differs from how the fishery currently operates. Similarly, fishing behavior/effort (e.g., gear quantity, soak/tow time, area fished) in the groundfish fishery is not expected to change from current operating conditions as a result of Option 2. Based on this, the AM measures are not expected to impact protected species and are similar to those provided above for Option 1; for rationale to support this determination see Option 1, Section 7.3.3.1.1.1. Relative to Option 1, Option 2 will result in neutral impacts to protected species.

7.4 Economic Impacts

Introduction

Consideration of the economic impacts of the changes made in this framework is required pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1976. NEPA requires that before any federal agency may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS) that includes the integrated use of the social sciences (NEPA Section 102(2) (C)). The MSA stipulates that the social and economic impacts to all fishery stakeholders should be analyzed for each proposed fishery management measure to provide advice to the Council when making regulatory decisions (Magnuson-Stevens Section 1010627, 109-47).

The National Marine Fisheries Service (NMFS) provides guidelines to use when performing economic reviews of regulatory actions. The key dimensions for this analysis are expected changes in net benefits to fishery stakeholders, the distribution of benefits and costs within the industry, and changes in income and employment (NMFS 2007). Where possible, cumulative effects of regulations are identified and discussed. Non-economic social concerns are discussed in Section 7.5. The economic impacts presented here consist of both qualitative and quantitative analyses dependent on available data, resources, and the measurability of predicted outcomes. It is assumed throughout this analysis that changes in revenues would have downstream impacts on income levels and employment; however, these are only mentioned if directly quantifiable.

7.4.1 Updates to Formal Rebuilding Programs and Annual Catch Limits

7.4.1.1 Formal Rebuilding Programs

7.4.1.2 Annual Catch Limits

7.4.1.2.1 Option 1: No Action
7.4.1.2.2 Option 2: Revised Annual Catch Limit Specifications

Table A, Econ: Comparison of commercial groundfish sub-ACLs (mt) for FY2018 and FY2019, including the percent change between years.

		Commercial groundfish sub-ACL		
	Stock	**FY2018 (adjusted for FY2016 overages*)**	**FY2019**	**% Change**
Allocated Stocks	GB Cod*	1,194	1,568	31%
	GOM Cod*	369	390	6%
	GB Haddock	44,659	53,276	19%
	GOM Haddock	8,738	8,312	-5%
	GB Yellowtail Flounder	169	85	-50%
	SNE/MA Yellowtail Flounder	42	32	-24%
	CC/GOM Yellowtail Flounder	398	398	0%
	American Plaice	1,580	1,467	-7%
	Witch Flounder*	830	854	3%
	GB Winter Flounder	731	774	6%
	GOM Winter Flounder	357	355	-1%
	SNE/MA Winter Flounder	518	518	0%
	Redfish	10,755	10,972	2%
	White Hake	2,735	2,735	0%
	Pollock	37,400	37,400	0%
Non-allocated Stocks	GOM/GB Windowpane Flounder	63	63	0%
	SNE/MA Windowpane Flounder	53	53	0%
	Ocean Pout	94	94	1%
	Atlantic Halibut	77	75	-2%
	Atlantic Wolffish	82	82	0%

Table B, Econ: Comparison of other fisheries sub-ACLs (mt) for FY2018 and FY2019, including the percent change between years.

Fishery	Stock	FY 2018 sub-ACL	FY2019	% Change
Recreational Groundfish	GOM Cod	220	220	0%
	GOM Haddock	3,358	3,194	-5%
Sea Scallop	GB Yellowtail Flounder	33	17	-50%
	SNE/MA Yellowtail Flounder	4	15	275%
	GOM/GB Windowpane Flounder	18	18	0%
	SNE/MA Windowpane Flounder	158	158	0%
Midwater Trawl	GB Haddock	680	811	19%
	GOM Haddock	122	116	-5%
Small-Mesh	GB Yellowtail Flounder	4	2	-51%
Other Sub-components – Large-Mesh Non-Groundfish[1]	SNE/MA Windowpane Flounder	218	218	0%

[1]The value for Other Sub-components for SNE/MA Windowpane Flounder includes the other sub-component value for Large-Mesh Non-Groundfish Trawl Fisheries.

7.5 Social Impacts

7.5.1 Social Impact Analysis

National Standard 8 (NS8) requires the Council to consider the importance of fishery resources to affected communities and provide those communities with continuing access to fishery resources, but it does not allow the Council to compromise the conservation objectives of the management measures. Thus, continued overall access to fishery resources is a consideration, but not a guarantee that fishermen would be able to use a particular gear type, harvest a particular species of fish, fish in a particular area, or fish during a certain time of the year.
A fundamental difficulty exists in forecasting social change relative to management alternatives, since communities or other societal groups are constantly evolving in response to external factors (e.g., market conditions, technology, alternate uses of waterfront, tourism). Certainly, fishery regulations influence the direction and magnitude of social change, but attribution is difficult with the tools and data available.

While the focus here is on the social impacts of the alternatives, external factors may also influence change, both positive and negative, in the affected communities. External factors may also lead to unanticipated consequences of a regulation, due to cumulative impacts. These factors contribute to a community's ability to adapt to new regulations. When examining potential social impacts of management measures, it is important to consider impacts on the following: the fishing fleet (vessels grouped by fishery, primary gear type, and/or size); vessel owners and employees (captains and crew); groundfish dealers and processors; final users of groundfish; community cooperatives; fishing industry associations; cultural components of the community; and fishing families. While some management measures may have a short term negative impact on some communities, these should be weighed against potential long-term benefits to all communities which can be derived from a sustainable groundfish fishery.

Social Impact Factors. The social impact factors outlined below can be used to describe the Northeast multispecies fishery, its sociocultural and community context, and its participants. These factors or variables are considered relative to the management alternatives and used as a basis for comparison between alternatives. Use of these kinds of factors in social impact assessment is based on NMFS guidance (NMFS 2007a) and other texts (e.g., Burdge 1998). Longitudinal data describing these social factors region-wide and in comparable terms is limited. Qualitative discussion of the potential changes to the factors characterizes the likely direction and magnitude of the impacts.

The social impact factors fit into five categories:

1. *Size and Demographic Characteristics* of the fishery-related workforce residing in the area; these determine demographic, income, and employment effects in relation to the workforce as a whole, by community and region.
2. The *Attitudes, Beliefs, and Values* of fishermen, fishery-related workers, other stakeholders and their communities; these are central to understanding the behavior of fishermen on the fishing grounds and in their communities.
3. The *Social Structure and Organization*; that is, changes in the fishery's ability to provide necessary social support and services to families and communities, as well as effects on the community's social structure, politics, etc.
4. The *Non-Economic Social Aspects* of the fishery; these include lifestyle, health, and safety issues, and the non-consumptive and recreational uses of living marine resources and their habitats.
5. The *Historical Dependence on and Participation in* the fishery by fishermen and communities, reflected in the structure of fishing practices, income distribution, and rights (NMFS 2007a).

Data utilized to inform the social impact factors include the 2016 Groundfish-Specific Commercial Engagement and Reliance Indicators, the 2016 Community Social Vulnerability Indicators (CSVI), the 2014 Survey on the Socio-Economic Aspects of Commercial Fishing Vessel Owners in the Northeast and Mid-Atlantic Owner (Owner Survey), and the 2012 Survey on the Socio-Economic Aspects of Commercial Fishing Crew in the Northeast and Mid-Atlantic (Crew Survey). These data sources constitute the best available social scientific data on fishing industry participants and communities engaged in the groundfish fishery in the Northeast.

The Groundfish-Specific Engagement and Reliance Indicators are numerical indices that reflect the level of a community's engagement in and reliance upon the groundfish fishery relative to other communities in the Northeast. These indices were generated using a principal components factor analysis (PCFA) of variables related to groundfish fishing activity from NOAA Fisheries regional datasets. PCFA is a common statistical technique used to identify factors that are related, yet linearly independent, and likely represent a latent or unobservable concept when considered together, such as factors that contribute to the level of a community's social vulnerability or engagement in commercial fishing. The variables that were identified to best reflect community engagement in the groundfish fishery were the value of groundfish landings (in dollars), the groundfish pounds landed, the number of federally permitted dealers that purchased at least one pound of groundfish, and the number of vessels with at least one category of large mesh groundfish permit (multiple permits on one vessel in a given year are not double counted). Variables that represent community commercial groundfish reliance were the value of landed groundfish per 1,000 population, groundfish pounds landed per 1,000 population, the number of federally-permitted dealers that purchased at least one pound of groundfish per 1,000 population, and the number of vessels with a groundfish permit per 1,000 population. It should be noted that while groundfish-specific commercial reliance is designed to measure the amount that a community may be reliant upon the commercial groundfish fishery, the total population size of a given community can have an outsized influence on the level of reliance reflected in the index scores. Also, the groundfish-specific commercial reliance indicator does not necessarily mean that a community or its fishery participants are solely dependent upon commercial groundfish fishing activities. There may be other commercial fishing or economic activities that may sustain the livelihoods of individuals or entities within these communities that have relied in groundfish historically. All of the engagement and reliance index variables were constructed as 5-year averages in order to match the range of years considered in the 5-year American Community Survey estimates utilized to create the CSVIs.

The CSVIs include indices of labor force structure, housing characteristics, poverty, population composition, and personal disruption. The labor force structure index measures the makeup of the labor force and is reversed scored so that a higher factor score represents fewer employment opportunities and greater labor force vulnerability. The housing characteristics index measures vulnerability related to infrastructure and home and rental values. It is also reversed score so that a higher score represents more vulnerable housing infrastructure. The poverty index captures multiple different factors that contribute to an overall level of poverty in a given area. A higher poverty index score would indicate a greater level of vulnerability due to a higher proportion of residents receiving public assistance and below federal poverty limits. The population composition index measures the presence of vulnerable populations (i.e., children, racial/ethnic minorities, and/or single-parent, female-headed households) and a higher score would indicate that a community's population is composed of more vulnerable individuals. Finally, the personal disruption index considers variables that affect individual-level vulnerability primarily and include factors such as low individual-level educational attainment or unemployment. Higher scores of personal disruption likely indicate greater levels of individual vulnerability within a community, which can in turn impact the overall level of community social vulnerability.

Data used to develop these indices come from multiple secondary data sources, but primarily the U.S. Census American Community Survey (ACS) at the place level (Census Designated Place (CDP) and Minor Civil Division (MCD)). More information about the data sources, methods, and other background details can be found online at https://www.st.nmfs.noaa.gov/humandimensions/social-indicators/.

Table xx displays the factor scores for the Groundfish-Specific Commercial Engagement and Reliance Indicators and CSVIs for those communities that have high commercial engagement with groundfish. The index factor scores are commonly categorized from low to high based on the number of standard deviations from the mean, which is set at zero. Categories rank from 0.00 or below as "low", 0.00 – 0.49 as "medium," and 0.50 – 0.99 as "medium-high," and 1 standard deviation or above as "high." Medium-high scores are highlighted in Table xx by orange and high scores are highlighted by red. Since all of the communities listed are those communities that have high groundfish-specific commercial engagement, none of the factor scores in the commercial engagement score column needed to be highlighted for emphasis.

Table xx. 2016 Groundfish-Specific Commercial Engagement, Reliance and Social Vulnerability Indicator Factor Scores for Communities Highly Engaged in the Commercial Groundfish Fishery.

	Population Size (2016)	Groundfish Commercial Engagement and Reliance		Social Vulnerability				
Community	*Pop. Size*	*Engagement*	*Reliance*	*Labor Force*	*Housing Characteristics*	*Poverty*	*Population Composition*	*Personal Disruption*
Gloucester, MA	29,546	14.901	**10.675**	-0.117	0.019	-0.352	-0.709	-0.313
New Bedford, MA	94,988	13.968	**3.282**	-0.177	**0.501**	**1.229**	**0.743**	**0.877**
Boston, MA	658,279	6.188	0.012	-0.888	-0.037	**0.933**	**0.781**	0.421
Narragansett/Point Judith, RI	15,672	4.790	**2.368**	0.093	-0.177	-0.860	-0.975	-0.458
Montauk, NY	3,510	3.984	**4.251**	0.221	-0.403	-0.034	-0.516	-0.617
Portland, ME	66,649	3.348	**3.251**	-0.990	0.351	**0.666**	-0.315	-0.088
Chatham, MA	1,429	2.621	**2.234**	**0.951**	0.067	0.216	-0.784	-0.367
Scituate, MA	18,390	2.380	**1.912**	-0.294	-0.879	-0.606	-0.803	-0.735
Hampton Bays/ NY	13,040	2.092	**1.554**	-0.016	-0.725	-0.614	-0.008	-0.539
Cape May, NJ	3,529	1.617	**1.379**	**1.192**	0.196	-0.164	-0.779	-0.699
Portsmouth, NH	21,458	1.435	**1.182**	-0.895	0.074	-0.729	-0.744	-0.677
New London, CT	27,218	1.198	-0.161	-0.549	**0.540**	**1.555**	**0.722**	**1.189**
Point Pleasant, NJ	18,464	1.180	**0.757**	-0.725	-0.662	-0.624	-0.763	-0.648