Environmental Consequences – Analysis of Impacts Economic Impacts

7.0 Environmental Consequences – Analysis of Impacts

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 Annual Catch Limits

7.4.1.1 Annual Catch Limits

7.4.1.1.1 Option 1: No Action

Economic impacts on the commercial groundfish fishery

[Quota change model results to be provided]

Economic impacts on the recreational groundfish fishery

Option 1 would have neutral impacts to the recreational fishery relative to FY 2017 for GOM cod and positive impacts for GOM haddock. The recreational groundfish sub-ACLs for GOM cod and GOM haddock would be unchanged from those specified in FW55, constant quota for GOM cod and an increasing quota for GOM haddock.

Option 1 would likely have negative impacts to the recreational fishery relative to Option 2, as the recreational sub-ACLs for both GOM cod and GOM haddock in FY 2018 would be unchanged and considerably lower from those specified in FW57. Option 2 would increase the recreational sub-ACLs for both stocks. The higher sub-ACLs under Option 2 should allow for more relaxed regulations while keeping GOM cod and GOM haddock mortality in the recreational fishery below the sub-ACL.

Economic impacts on other fisheries

Sea scallop fishery

Under Option 1, the following sub-ACLs would be allocated to the scallop fishery during the 2018 FY: 55mt of GB yellowtail flounder, 37mt of SNE/MA yellowtail flounder, 209mt of SNE/MA windowpane flounder, and 36mt of GOM/GB windowpane flounder. Under Option 1, the FY 2017 sub-ACL adjustment for GB yellowtail would be +23mt and the adjustment for SNE/MA yellowtail would be +3mt from FY2017 levels. Accordingly, Option 1 would have positive impacts to the scallop fishery relative to FY2017. The sub-ACL for SNE/MA windowpane flounder and GOM/GB windowpane flounder would be unchanged from FY2017.

Under Option 1, the sea scallop fishery sub-ACL for GB yellowtail flounder of 55mt in FY2017 would be expected to be limiting if incidental catches remain similar to FY2017. Actual catches were 29.8mt in FY 2015, 2.1mt in FY2016, and are projected to be 63 mt in FY 2017. The sub-ACL for SNE/MA yellowtail flounder of 37mt in FY2017 would likely not be limiting if incidental catch rates remain similar to recent fishing years. Actual catches were 34.6 mt in FY 2015, 10.7 mt in FY 2016, and are projected to be 11.9 mt in FY 2017. The sub-ACL for SNE/MA windowpane flounder of 209mt in FY2017 would likely not be limiting if incidental catch rates remain similar to recent fishing years. The sub-ACL for GOM/GB windowpane flounder of 36mt in FY2017 would likely be limiting if incidental catch rates remain similar to projections. The sea scallop fishery sub-ACL for GOM/GB windowpane flounder was first allocated in FY 2017. Catches were projected to be 107.4 mt in FY 2017. As of October 2017, catch was 43 mt, and so catch may exceed 36 mt (see Scallop PDT memo on Scallop Fishery Bycatch Projections, dated Nov. 22, 2017). The projected bycatch for FY 2018 is between 44.96 and 74.79 mt. The extent of revenue reduction from the presence of AMs is uncertain at this time.

Relative to the Option 2, overall Option 1 would result in larger sub-ACLs for groundfish stocks and therefore would have positive impacts to the sea scallop fishery.

Midwater trawl directed Atlantic herring fishery

Option 1 would have positive and neutral impacts to the Midwater trawl directed Atlantic herring fishery relative to FY2017. The sub-ACL for GOM haddock would increase from 42mt in FY2017 to 45mt for FY2018. The sub-ACL for GB haddock would decrease from 801mt in FY2017 to 724mt for FY2018.

Actual catches of GOM haddock were 0mt in FY 2015 and 1.9mt in FY2016. Actual catches of GB haddock were 235.5mt in FY 2015 and 118.9mt in FY2016. Accountability measures were triggered inseason in FY2015 due to overages in FY2015.

Under Option 2, the midwater trawl directed Atlantic herring fishery sub-ACL for GB haddock is 680mt in FY2018 and for GOM haddock 122mt in FY2018. Relative to Option 2, Option 1 is expected to have positive economic impacts for the midwater trawl directed Atlantic herring fishery for GB haddock and negative economic impacts for GOM haddock.

Small mesh fishery

Option 1 would have positive impacts to the small mesh fishery relative to FY2017. The sub-ACL for GB yellowtail flounder in the small mesh fishery would increase from 4mt in FY2017 to 7mt for FY 2018. Actual catches were 0.1mt in FY 2015 and 4.8mt in FY2016.

Option 1 would also have positive impacts to the small mesh fishery relative to Option 2. Option 2 would decrease the sub-ACL for GB yellowtail flounder to 4mt in FY2018. While this sub-ACL is not monitored in-season, AMs can be triggered at the end of the FY from an overage.

<u>Large-mesh non-groundfish trawl fisheries (included within the other sub-component)</u>

Option 1 would have neutral impacts to the small mesh fishery relative to FY2017. The other subcomponent for SNE/MA windowpane flounder would remain at 249mt in FY2017 and FY 2018. Actual catches in the other sub-component were 256.1mt in FY 2015 and 178.1mt in FY2016. Accountability measures were triggered for FY2017 due to overages in FY2015.

Option 1 would also have positive impacts to the large-mesh non-groundfish trawl fisheries relative to Option 2. Option 2 would decrease the other sub-component to 218mt in FY 2018. While this component of catch is not monitored in-season, AMs can be triggered at the end of the FY from an overage.

7.4.1.1.2 Option 2: Revised Annual Catch Limit Specifications

[Quota change model results to be provided]

Table 1 provides the changes in the commercial groundfish fishery sub-ACLs between FY2017 and FY2018 for allocated and non-allocated groundfish stocks, under Option 2. Table 2 summarizes the changes in sub-ACLs for groundfish stock for the recreational fishery, sea scallop fishery, midwater directed Atlantic herring fishery, small-mesh fisheries, and large-mesh non-groundfish trawl fisheries included in the other sub-component.

Table 1- Commercial groundfish sub-ACLs for FY 2017 and FY 2018 under Option 2 in mt.

| | Stock | FY 2017 commercial groundfish sub- ACL | FY 2018 commercial groundfish sub- ACL | % Change |
|-------------------------|----------------------------------|---|---|----------|
| Allocated | GB Cod | 531 | 1,360 | 156.1% |
| Stocks | GOM Cod | 280 | 390 | 39.3% |
| | GB Haddock | 52,620 | 44,659 | -20.8% |
| | GOM Haddock | 3,018 | 8,738 | 189.5% |
| | GB Yellowtail | 163 | 169 | 3.7% |
| | Flounder | | | |
| | SNE/MA Yellowtail Flounder | 187 | 42 | -77.5% |
| | CC/GOM | 341 | 398 | 16.7% |
| | Yellowtail Flounder | 311 | 370 | 10.770 |
| | American Plaice | 1,218 | 1,580 | 29.7% |
| | Witch Flounder | 734 | 849 | 15.7% |
| | GB Winter Flounder | 620 | 731 | 17.9% |
| | GOM Winter Flounder | 639 | 357 | -44.1% |
| | SNE/MA Winter Flounder | 585 | 518 | -11.5% |
| | Redfish | 10,183 | 10,755 | 5.6% |
| | White Hake | 3,358 | 2,735 | -18.6% |
| | Pollock | 17,817 | 37,400 | 109.9% |
| Non-allocated Stocks | GOM/GB Windowpane Flounder | 129 | 63 | -51.2% |
| | SNE/MA Windowpane Flounder | 104 | 53 | -49% |
| | Ocean Pout | 130 | 94 | -27.3% |
| | Atlantic Halibut | 91 | 93 | 2.2% |
| | Atlantic Wolffish | 72 | 82 | 13.9% |

Table 2 – Sub-ACLs for other fisheries for FY 2017 and FY 2018 under Option 2 in mt.

| Fishery | Stock | FY 2017 sub- ACL | FY 2018 sub- ACL | % Change |
|---|----------------------------------|---------------------|---------------------|----------|
| Recreational | GOM Cod | 157 | 220 | 40.1% |
| Groundfish | GOM Haddock | 1,160 | 3,358 | 189.5% |
| Sea Scallop | GB Yellowtail Flounder | 32 | 33 | 3.1% |
| | SNE/MA Yellowtail Flounder | 34 | 5 | -85.3% |
| | GOM/GB Windowpane Flounder | 36 | 18 | -50% |
| | SNE/MA Windowpane Flounder | 209 | 158 | -24.4% |
| Midwater Trawl | GB Haddock | 801 | 680 | -15.1% |
| | GOM Haddock | 42 | 122 | 190.5% |
| Small-Mesh | GB Yellowtail Flounder | 4 | 4 | 0% |
| Other Sub- components – Large-Mesh Non- Groundfish ¹ | SNE/MA Windowpane Flounder | 249 | 218 | -12.4% |

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

Economic impacts on the commercial groundfish fishery

[Quota change model results to be provided]

Economic impacts on the Recreational Fishery relative to FY2017

Option 2 would likely result in positive impacts to the recreational fishery. Option 2 would increase the recreational sub-ACLs for GOM haddock and GOM cod in FY2018 compared with those in FY2017 (Table 2). Higher sub-ACLs for GOM haddock and GOM cod should result increased recreational fishing opportunities. Overall, Option 2 would be expected to have a positive economic impact compared to No Action.

Economic impacts on other fisheries

Sea scallop fishery

Under Option 2, the sea scallop fishery sub-ACL for GB yellowtail flounder is expected to increase from 32 mt in FY2017 to 33 mt in FY2018, an increase of 3%. Actual catches were 29.8 mt in FY 2015, 2.1 mt in FY2016, and are projected to be 63 mt in FY 2017. Accountability measures were not triggered in FYs 2015 or 2016. Recent utilization rates of GB yellowtail flounder in the groundfish fishery (9.5% in FY 2016; 18.9% in FY 2015; 24.5% in FY 2014) suggest that the total ACL is unlikely to be exceeded in FY 2018, even if the sub-ACL in the scallop fishery is. The scallop fishery is currently under a temporary provision to the AM implementation policy for FY 2017 and FY 2018 for GB yellowtail flounder, so that AMs would only be implemented if the scallop fishery exceeds its sub-ACL for the stock and the overall ACL is also exceeded. This means that the likely threshold of GB yellowtail catch to trigger scallop fishery AMs would be 33 mt, and only if the total ACL of 206 mt is also exceeded, under Option 2. The projected bycatch of GB yellowtail flounder bycatch by the scallop in FY 2018 is between 6.06 and 67.95 mt (see Scallop PDT memo on Scallop Fishery Bycatch Projections, dated Nov. 22, 2017). Therefore, the scallop fishery would not be functionally limited by a sub-ACL of 33 mt in FY 2018.

GB yellowtail flounder AMs were developed for the sea scallop fishery in Amendment 15 to the Atlantic Sea Scallop FMP, and later modified in FW23. Currently, the scallop fishery is under a temporary provision to the AM implementation policy for FY 2017 and FY 2018, and is subject to an AM in the following fishing year if scallop vessels participating in either open-area or access-area trips exceed their sub-allocation of GB yellowtail flounder, and the total GB yellowtail flounder ACL is exceeded. The length of the AM area closures is determined by the overage percent. If the total ACL is exceeded, the fishery that caused the overage would also be subject to a pound for pound payback under the US/Canada resource sharing agreement.

Under Sub-option 2, the sea scallop fishery sub-ACL for SNE/MA yellowtail flounder is expected to decrease from 34 mt in FY 2017 to 5 mt in FY 2018, a decrease of 85.3%. Actual catches were 34.6 mt in FY 2015, 10.7 mt in FY 2016, and are projected to be 11.9 mt in FY 2017.

Accountability measures were not triggered in FYs 2015 or 2016 and are not projected to be triggered in FY 2017. With a sub-ACL of 5 mt in FY 2018 and catch projections in FY 2017 and actual catches in FY 2016 that exceed 7.5 mt (150% of 5 mt), there is a possibility that accountability measures will be triggered. However, the temporary provision to the AM implementation policy, described above for GB yellowtail flounder, is being considered for SNE/MA yellowtail flounder for FY 2018, so that AMs would only be implemented if the scallop fishery exceeds its sub-ACL for a stock and the overall ACL is also exceeded. If the temporary provision to the AM implementation policy were to be implemented in FY 2018, this means that the likely threshold of SNE/MA yellowtail catch to trigger scallop fishery AMs would be 5 mt, and only if the total ACL of 50 mt is also exceeded, under Option 2. Recent utilization rates of SNE/MA yellowtail flounder in the groundfish fishery (30.6% in FY 2016; 48.9% in FY 2015; 71.0% in FY 2014) suggest that the total ACL is unlikely to be exceeded in FY 2018, even if the sub-ACL in the scallop fishery is. The projected bycatch of SNE/MA yellowtail flounder bycatch by the scallop fishery in FY 2018 is between 3.84 and 5.96 mt (see Scallop PDT memo on Scallop Fishery Bycatch Projections, dated Nov. 22, 2017). Therefore, the scallop fishery would not be functionally limited by a sub-ACL of 5 mt in FY 2018. If SNE/MA yellowtail flounder bycatch does exceed the projections, the scallop fishery could be negatively impacted by AMs.

Under Option 2, the sea scallop fishery sub-ACL for SNE/MA windowpane flounder is expected to decrease from 209 mt in FY2017 to 158 mt in FY2018, a decrease of 24.4%. Actual catches were 210.6 mt in FY 2015, 84.4 mt in FY 2016, and were projected to be 85.08 mt in FY 2017. As of October 2017, catch was 210 mt, and so catch may exceed 209 mt (see Scallop PDT memo on Scallop Fishery Bycatch

Projections, dated Nov. 22, 2017). The AM for SNE/MA windowpane flounder is implemented if the scallop fishery exceeds its sub-ACL for the stock and the overall ACL is also exceeded. This means that the likely threshold of SNE/MA windowpane flounder catch to trigger scallop fishery AMs would be 158 mt, and only if the total ACL of 457mt is also exceeded, under Option 2. Recent utilization rates of SNE/MA windowpane flounder in the groundfish fishery (121.9% in FY16; 134.9% in FY15; 94.4% in FY14) suggest that the total ACL could be exceeded in FY 2018. The projected bycatch of SNE/MA windowpane flounder bycatch by the scallop in FY 2018 is between 33.73 and 308.23 mt (see Scallop PDT memo on Scallop Fishery Bycatch Projections, dated Nov. 22, 2017). There is a possibility that accountability measures will be triggered. Given these recent conditions, it is possible that the scallop fishery would be functionally limited by a SNE/MA windowpane flounder sub-ACL of 158 mt in FY 2018.

Under Option 2, the sea scallop fishery sub-ACL for GOM/GB windowpane flounder is expected to decrease from 36 mt in FY2017 to 18 mt in FY2018, a decrease of 50%. The sea scallop fishery sub-ACL for GOM/GB windowpane flounder was first allocated in FY 2017. Catches were projected to be 107.4 mt in FY 2017. As of October 2017, catch was 43 mt, and so catch may exceed 36 mt (see Scallop PDT memo on Scallop Fishery Bycatch Projections, dated Nov. 22, 2017). The scallop fishery is currently under a temporary provision to the AM implementation policy for FY 2017 and FY 2018 for GOM/GB windowpane flounder, so that AMs would only be implemented if the scallop fishery exceeds its sub-ACL for the stock and the overall ACL is also exceeded. This means that the likely threshold of GOM/GB windowpane flounder catch to trigger scallop fishery AMs would be 18 mt, and only if the total ACL of 86 mt is also exceeded, under Option 2. Recent utilization rates of GOM/GM windowpane flounder in the groundfish fishery (68.25% in FY 2016; 75.1% in FY 2015; 160.9% in FY 2014) suggest that the total ACL is not likely to be exceeded in FY 2018. The projected bycatch of GOM/GB windowpane flounder bycatch by the scallop in FY 2018 is between 44.96 and 74.79 mt (see Scallop PDT memo on Scallop Fishery Bycatch Projections, dated Nov. 22, 2017). Given these recent conditions, it is likely that the scallop fishery would be functionally limited by a GOM/GB windowpane flounder sub-ACL of 18 mt in FY 2018.

Overall, relative to Option 1/No Action, Option 2 is expected to have negative impacts on the sea scallop fishery.

Midwater trawl directed Atlantic herring fishery

Under Option 2, the midwater trawl directed Atlantic herring fishery sub-ACL for GB haddock is expected to decrease from 801mt in FY2017 to 680mt in FY2018, a decrease of 15.1%. Actual catches were 235.5mt in FY 2015 and 118.9mt in FY2016. Accountability measures were triggered in-season in FY2015 due to overages in FY2015.

Under Option 2, the midwater trawl directed Atlantic herring fishery sub-ACL for GOM haddock is expected to increase from 42mt in FY2017 to122mt in FY2018, an increase of 190.5%. Actual catches were 0mt in FY 2015 and 1.9mt in FY2016.

Relative to Option 1, Option 2 is expected to have negative economic impacts for the midwater trawl directed Atlantic herring fishery for GB haddock and positive economic impacts for GOM haddock.

Small-mesh fisheries

Under Option 2, the small-mesh fisheries sub-ACL for GB yellowtail flounder is expected to remain at 4mt in FY2017 and FY2018. Actual catches were 0.1mt in FY 2015 and 4.8mt in FY2016.

Option 2 would have negative impacts to the small mesh fishery relative to Option 1. Option 2 would decrease the sub-ACL for GB yellowtail flounder to 4mt in FY2018 from the value of 7mt under No

Action for FY2018. While this sub-ACL is not monitored in-season, AMs can be triggered at the end of the FY from an overage.

<u>Large-mesh non-groundfish trawl fisheries (included within the other sub-component)</u>

Under Option 2, the other sub-component value (used to evaluate if an AM is triggered for large-mesh non-groundfish trawl fisheries) for SNE/MA windowpane flounder is expected to decrease from 249mt in FY2017 to 218mt in FY2018, a decrease of 21.4%. Actual catches in the other sub-component were 256.1mt in FY 2015 and 178.1mt in FY2016. Accountability measures were triggered for FY2017 due to overages in FY2015.

Option 2 would also have negative impacts to the large-mesh non-groundfish trawl fisheries relative to Option 1. Option 2 would decrease the other sub-component to 218mt in FY 2018. While this component of catch is not monitored in-season, AMs can be triggered at the end of the FY from an overage.

7.5.1.1.2.1 Sub-Option 1: Updates to Common Pool Vessel Accountability Measures - Target (Trimester) Total Allowable Catch (TAC)

Option 1: No Action

Groundfish Fishery

No action would maintain the trimester TAC apportionments as determined in Amendment 16. The economic impacts of Option 1 would be neutral in that status quo would be retained, and there would be no revisions to the trimester TAC apportionments. However, relative to Option 2, Option 1 would likely have low negative economic impacts to the common pool segment of the groundfish fishery. Option 1 would not offer the same flexibility as Option 2 to adjust trimester TAC apportionments using the most recent data on fishing effort and catches.

Option 2: Revised Common Pool Vessel Trimester Total Allowable Catch (TAC) Apportionments

Groundfish Fishery

Amendment 16 outlined the process for updating trimester TAC apportionments, which specified they should be calculated using the most recent 5-year period of data available. The Council recommended limiting the revisions to those stocks that have experienced early closure in trimester 1 or 2 since implementation of A16.

Table 3 shows the stocks that meet the Council's criteria: Georges Bank cod, Gulf of Maine (GOM) cod, Southern New England/Mid-Atlantic yellowtail flounder, Cape Cod/GOM yellowtail flounder, American plaice, and witch flounder. In general, stocks that experienced early closure in either trimester 1 or 2 had high utilization of the common pool TAC for those years (Table 4). Two stocks, GOM haddock and white hake, met the criteria early in the time series (FY 2012 and FY 2013), but the following rationale was provided for recommending not adjusting common pool trimester TACs for these stocks:

• White hake had closures in Trimester 1 and 2 of FY 2012, in which 91.6% of the common pool sub-ACL for white hake was utilized. But since then, utilization of the common pool sub-ACL for white hake has decreased substantially while the sub-ACL has increased slightly from 26 mt in FY 2012 to 32 mt in FY 2015. This change in utilization of the sub-ACL and increase in sub-ACL provides support for not adjusting the common pool trimester TAC for white hake.

• GOM haddock had a closure in Trimester 1 of FY 2013, in which 108.9% of the common pool sub-ACL for GOM haddock was utilized. The common pool sub-ACL for GOM haddock had decreased from 5 mt in FY 2012 to 2 mt in FY 2013; the sub-ACL then doubled to 4 mt in FY 2014 and has continued to increase, with a FY 2016 sub-ACL of 25.6 mt. Utilization of the common pool sub-ACL for GOM haddock has remained relatively stable since FY 2013. This change in utilization of the sub-ACL and increase in sub-ACL provides support for not adjusting the common pool trimester TAC for GOM haddock.

Table 5 shows the common pool trimester TACs under the No Action apportionments and Option 2 apportionments. The six stocks that would have changes to trimester TAC apportionments are highlighted. Trimester TACs under the updated apportionments would be allocated at the beginning of FY 2018.

Option 2 would result in low positive impacts to the common pool segment of the groundfish fishery. By updating trimester TAC apportionments using the most recent catch data, TACs would be reassigned into trimesters where more of the catches are occurring for these stocks. This could reduce the likelihood of the common pool exceeding the trimester TACs for these stocks and experiencing early closures, which could allow for increased fishing effort on certain stocks in Trimesters 1 and 2.

Table 3 – Stocks with Common Pool Closures in Trimester 1 or 2 from FY2012-FY2017

| | FY2 | 2012 | FY2 | 2013 | FY2 | 2014 | FY2 | 2015 | FY2 | 2016 | FY2 | 017 |
|----------------------|-----|-----------|-----|-----------|-----|-----------|------------|-----------|-----|-----------|-----|-----|
| Stock | T1 | T2 | T1 | T2 | T1 | T2 | T 1 | T2 | T1 | T2 | T1 | T2 |
| GB Cod | | | X | | X | | | | X | X | X | X |
| GOM Cod | | | | | X | | X | | X | | | |
| GB Haddock | | | | | | | | | | | | |
| GOM Haddock | | | X | | | | 1 | | | | | |
| GB Yellowtail | | | | | | | | | | | | |
| SNE/MA Yellowtail | | | | | X | | X | | | | | |
| CC/GOM Yellowtail | | | | | | | X | | X | | | |
| American Plaice | | | | | X | | X | | | | X | |
| Witch Flounder | | | | | | | | | X | X | | |
| GB Winter | | | | | | | | | | | | |
| GOM Winter | | | | | | | | | | | | |
| Redfish | | | | | | | | | | | | |
| White Hake | X | X | | _ | _ | _ | _ | _ | _ | _ | _ | |
| Pollock | - | | | _ | _ | _ | _ | | _ | _ | _ | |

An "x" indicates a closure for that stock in that trimester. Trimester 2 of FY2017 is currently in progress.

Table 4 – Percent of Common Pool Sub-Annual Catch Limits Taken (%) for Stocks with Common Pool Closures in Trimester 1 or 2 from FY2012-FY2016

| Stock | FY2012 | FY 2013 | FY 2014 | FY 2015 | FY2016 |
|-----------------|--------|---------|---------|---------|--------|
| GB Cod | 35.4 | 101.0 | 65.8 | 95.8 | 124.8 |
| GOM Cod | 37.3 | 48.9 | 57.1 | 86.3 | 68.8 |
| GOM Haddock | 18.6 | 108.9 | 21.6 | 24.8 | 40.4 |
| SNE/MA | 24.4 | 93.1 | 85.7 | 91.7 | 51.3 |
| Yellowtail | | | | | |
| CC/GOM | 13.0 | 31.5 | 6.3 | 64.0 | 83.7 |
| Yellowtail | | | | | |
| American Plaice | 6.1 | 14.3 | 31.3 | 51.5 | 86.6 |
| Witch Flounder | 10.5 | 30.6 | 9.6 | 98.7 | 94.2 |
| White Hake | 91.6 | 21.6 | 28.6 | 0.8 | 2.7 |

Values in bold indicate that a trimester closure occurred for that stock in that fishing year.

Table 5 - Common Pool Trimester Total Allowable Catches (TACs) under No Action apportionments and Option 2 apportionments (mt). Option 2 would update FY 2018 trimester TAC apportionments for six stocks (highlighted).

| | No A | ction | | | Option 2 | |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Stock | Trimester 1 | Trimester 2 | Trimester 3 | Trimester 1 | Trimester 2 | Trimester 3 |
| GB Cod | 6.3 | 9.3 | 9.6 | 7.0 | 8.5 | 9.6 |
| GOM Cod | 3.4 | 4.6 | 4.7 | 6.2 | 4.2 | 2.3 |
| GB Haddock | 84.0 | 102.6 | 124.4 | 84.0 | 102.6 | 124.4 |
| GOM | 25.6 | 24.7 | 44.6 | 25.6 | 24.7 | 44.6 |
| Haddock | | | | | | |
| GB Yellowtail | 0.5 | 0.8 | 1.3 | 0.5 | 0.8 | 1.3 |
| SNE/MA | 1.7 | 3.0 | 3.4 | 1.7 | 2.2 | 4.1 |
| Yellowtail | | | | | | |
| CC/GOM | 6.1 | 6.1 | 5.3 | 10.0 | 4.6 | 3.0 |
| Yellowtail | | | | | | |
| American | 7.1 | 10.6 | 11.8 | 21.8 | 2.4 | 5.3 |
| Plaice | | | | | | |
| Witch | 5.1 | 5.9 | 7.9 | 10.4 | 3.8 | 4.7 |
| Flounder | | | | | | |
| GB Winter | 0.5 | 1.4 | 4.2 | 0.5 | 1.4 | 4.2 |
| GOM Winter | 6.5 | 6.7 | 4.4 | 6.5 | 6.7 | 4.4 |
| Redfish | 14.8 | 18.4 | 26.1 | 14.8 | 18.4 | 26.1 |
| White Hake | 8.3 | 6.8 | 6.8 | 8.3 | 6.8 | 6.8 |
| Pollock | 66.4 | 83.0 | 87.7 | 66.4 | 83.0 | 87.7 |

7.5.1.1.2.2 Sub-Option 2: Scallop Sub-ACL for SNE/MA Yellowtail Flounder

Option 1: No Action

Groundfish Fishery

No Action will continue to provide positive benefits to the groundifsh fishery as the sea scallop fishery will be accountably to its own catches. Relative to Sub-Option 2, Option 1 would be negative as it would not incorporate the most recent catch estimates – which are much lower than previously estimated.

Sea Scallop Fishery

Under Option 1, the FY 2017 sub-ACL adjustment for GB yellowtail would be +23mt and the adjustment for SNE/MA yellowtail would be +3mt from FY2017 levels. Accordingly, Option 1 would have positive

impacts to the scallop fishery relative to FY2017. The sub-ACL for SNE/MA yellowtail flounder of 37mt in FY2017 would likely not be limiting if incidental catch rates remain similar to recent fishing years. Actual catches were 34.6 mt in FY 2015, 10.7 mt in FY 2016, and are projected to be 11.9 mt in FY 2017.

Relative to the Sub-Option 2, overall Option 1 would result in larger sub-ACL and therefore would have positive impacts to the sea scallop fishery.

Sub-Option2: Scallop Sub-ACL for SNE/MA Yellowtail Flounder

Groundfish Fishery

Sub-Option 2 will continue to provide positive benefits to the groundfish fishery as the sea scallop fishery will be accountably to its own catches. Relative to Option 1, Sub-Option 2 would be positive as it would incorporate the most recent catch estimates – which are much lower than previously estimated.

Sea scallop fishery

Under Sub-option 2, the sea scallop fishery sub-ACL for SNE/MA yellowtail flounder is expected to decrease from 34 mt in FY 2017 to 5 mt in FY 2018, a decrease of 85.3%. Actual catches were 34.6 mt in FY 2015, 10.7 mt in FY 2016, and are projected to be 11.9 mt in FY 2017.

Accountability measures were not triggered in FYs 2015 or 2016 and are not projected to be triggered in FY 2017. With a sub-ACL of 5 mt in FY 2018 and catch projections in FY 2017 and actual catches in FY 2016 that exceed 7.5 mt (150% of 5 mt), there is a possibility that accountability measures will be triggered. However, the temporary provision to the AM implementation policy is being considered for SNE/MA yellowtail flounder for FY 2018, so that AMs would only be implemented if the scallop fishery exceeds its sub-ACL for a stock and the overall ACL is also exceeded. If the temporary provision to the AM implementation policy were to be implemented in FY 2018, this means that the likely threshold of SNE/MA yellowtail catch to trigger scallop fishery AMs would be 5 mt, and only if the total ACL of 50 mt is also exceeded, under Option 2. Recent utilization rates of SNE/MA yellowtail flounder in the groundfish fishery (30.6% in FY 2016; 48.9% in FY 2015; 71.0% in FY 2014) suggest that the total ACL is unlikely to be exceeded in FY 2018, even if the sub-ACL in the scallop fishery is. The projected bycatch of SNE/MA yellowtail flounder bycatch by the scallop fishery in FY 2018 is between 3.84 and 5.96 mt (see Scallop PDT memo on Scallop Fishery Bycatch Projections, dated Nov. 22, 2017). Therefore, the scallop fishery would not be functionally limited by a sub-ACL of 5 mt in FY 2018. If SNE/MA yellowtail flounder bycatch does exceed the projections, the scallop fishery could be negatively impacted by AMs.

Relative to the Option 1, Option 2 would result in smaller sub-ACL and therefore would have negative impacts to the sea scallop fishery.

7.4.2 Fishery Program Administration

7.4.2.1 Authority for Common Pool Trimester Total Allowable Catch (TAC) Apportionment Changes

7.4.2.1.1 Option 1: No Action

The economic impacts of Option 1 would be neutral in that status quo would be retained, and any changes to common pool trimester TACs would continue to be done through Council action. However, relative to

Option 2, Option 1 would likely have low negative economic impacts in terms of timing as Option 1 would require Council action. Option 1 would not offer the same flexibility as Option 2 for common pool management to allow the Regional Administrator to have broader authority to modify common pool trimester TACs or AM closures without requiring Council action, under certain conditions.

7.4.2.1.2 Option 2: Broaden Regional Administrator Authority to Modify Common Pool Trimester TACs and/or AM Closures

The economic impacts of Option 2 would likely be low positive relative to No Action. Amendment 16 outlines the process for updating the trimester TAC apportionments, which must be done through Council action. This approach would allow greater flexibility in allowing the Regional Administrator broader authority to modify TACs and AM closures without requiring Council action, under certain conditions. Revisions to the common pool trimester TAC apportionments would be limited to those stocks that have experienced early closure in trimester 1 or 2. By updating trimester TAC apportionments using the most recent catch data, TAC would be reassigned into trimesters where more of the catches are occurring for those stocks. This could reduce the likelihood of the common pool exceeding the trimester TACs for those stocks and experiencing early closure, which could allow for increased fishing effort.

7.4.3 Commercial and Recreational Fishery Measures

7.4.3.1 Accountability Measures

7.5.3.1.1 Atlantic Halibut Accountability Measures for Federal Fisheries

7.5.3.1.1.1. Option 1: No Action

[to be provided]

7.5.3.1.1.2 Option 2: Atlantic Halibut Accountability Measures for Federal Fisheries

7.5.3.1.1.2.1 Sub-Option 2A: Reactive AM of No Possession Would Apply to All Federal Permit Holders

[to be provided]

7.5.3.1.1.2.2 Sub-Option 2B: Modified Gear Restricted Areas

[placeholder]

7.5.3.1.2 Revised Southern Windowpane Accountability Measures for Large-Mesh Non-Groundfish Fisheries

7.5.3.1.2.1 Option 1: No Action

Groundfish fishery

No Action would continue to provide positive benefits to the groundfish fishery. Option 2 would also be expected to provide positive benefits, but to a lesser extent.

Large-mesh Non-groundfish Trawl Fisheries

No action would maintain the current southern windowpane AMs for large-mesh non-groundfish fisheries. These AMs were developed through Framework 47 in 2009. When the AMs are implemented, trawl vessels using five inch or greater mesh are required to use approved selective trawl gears in the large AM areas or in the small AM area, depending on the magnitude of the ACL overage (section 4.3.1.2.1).

These AMs were first triggered for non-groundfish fisheries in 2017 as a result of a 2015 ACL overage. They were implemented on August 1, 2017 and removed on September 1, 2017 via emergency rule (82 FR 41564). Landings and price data for 2017 are currently preliminary and incomplete. The economic impacts of this one-month AM are not known. The expected economic impacts of the AMs on non-groundfish fisheries are summarized below.

Southern windowpane flounder is a discard-only stock, with no economic value. The economic impacts of the no action alternative derive from impacts to targeted non-groundfish fisheries which are impacted by the southern windowpane flounder AMs. The use of approved selective trawl gears in the AM areas would be expected to reduce catches of non-groundfish target species such as summer flounder and scup. The AM areas include economically-important areas for summer flounder and scup fisheries. Revenues within the AM areas were calculated using the methodology described in DePiper (2014). Briefly, the methods are summarized. For the subset of trips that carried an at-sea observer, the true spatial extent of fishing activity on a trip can be determined from more detailed haul-by-haul position data. These detailed observations were compared with the single, self-reported, VTR point locations across a large number of fishing trips to develop models that could be applied to various fishing modes. Revenues were distributed in concentric rings around the VTR point proportional to the probability of fishing coming out of the statistical model. The size of the rings varies according to the trip characteristics. Predictive attributes included gear type and number of days absent. For example, week long trips have a larger footprint than day trips. Once every trip in the VTR database is spatially assigned using this approach, the resulting dataset can be queried according to year, gear type, or species caught, or according to a particular management area. The results of these queries can be mapped, or summarized in tables or figures.

The estimates of revenue or landings within a particular management area are not exact. There are a few possible reasons for a discrepancy between true revenue/effort and the model estimates. One is that for some fishing modes, there are limited haul-by-haul location data to develop a reliable effort/revenue distribution model. Another factor is that some types of fishing are known to occur along a depth contour, such that the assumed circular distribution of data around the reported point infers fishing to unlikely locations. Even for fisheries that are relatively well observed, the spatial imprecision of VTR reports can lead to the assignment of revenue in unlikely locations. Despite these caveats, the VTR data provides a general sense of fishing patterns across all trips and gears, and indicates the relative importance of specific areas in terms of revenue generated, species targeted, and number of participants, and are the most comprehensive data from which to assess fishing location.

Based on this methodology, within the AM areas, the estimated calendar year 2015 revenue from largemesh bottom-trawl fisheries was \$705,776 for summer flounder and \$601,571 for scup (Figure 1 and Figure 2). This represents approximately 2% of summer flounder ex-vessel revenues from all gear types in 2015 and about 5% of annual scup ex-vessel revenues from all gear types. These values give an idea of the economic importance of the areas encompassed by the AMs; however, if is unlikely that the full amount of these revenues would be lost if the AMs were implemented. Vessels may mitigate some economic losses by continuing to fish in the AM areas using approved selective gears or by simply shifting their fishing effort to neighboring areas. These actions may result in negative economic impacts if they result in:

- Lower stock-specific aggregate catches, due to lack of species availability outside of the AM area during the year gear restrictions are in place;
- Higher variable costs due to lower catch rates for economically important stocks either inside the AM area(s) when using selective gears, or outside the AM area(s) when using traditional gears;
- Higher gear costs associated with rigging and using selective gears.

Thus, overall, the economic impacts of the no action alternative on non-groundfish fisheries are expected to be slight to moderate negative in years when the AMs are implemented.

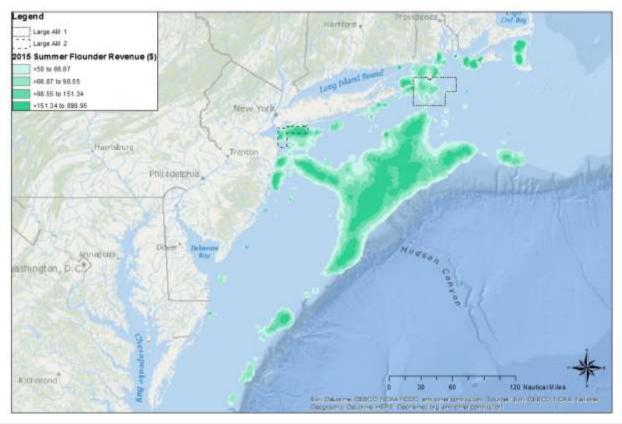


Figure 1: Model-estimated 2015 revenue of summer flounder, overlaid with the southern windowpane flounder accountability measures areas. Only revenues greater than \$50 per cell displayed. Revenue partitioned into four quantiles (see DePiper 2014 and NEFMC 2017 for more details).

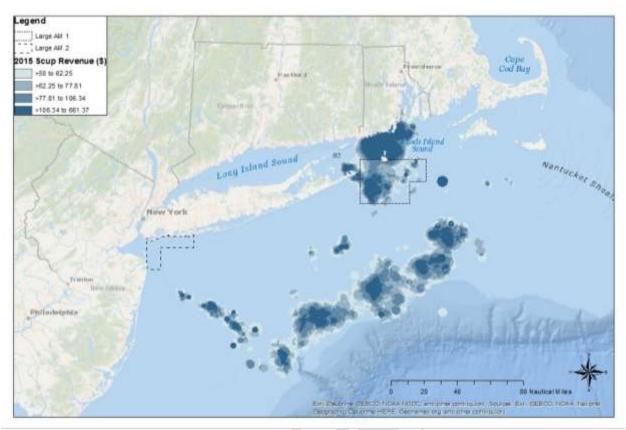


Figure 2: Model-estimated 2015 revenue of scup, overlaid with the southern windowpane flounder accountability measures areas. Only revenues greater than \$50 per cell displayed. Revenue partitioned into four quantiles (see DePiper 2014 and NEFMC 2017 for more details).

7.5.3.1.2.2 Option 2: Revised Southern Windowpane Accountability Measures for Large-Mesh Non-Groundfish Fisheries

The Council may select both Sub-Option 2A and 2B. The expected impacts of these alternatives on commercial fisheries are described in the following sections. If both alternatives were to be implemented, the expected impacts would be additive.

Groundfish fishery

No Action would continue to provide positive benefits to the groundfish fishery. Option 2 would also be expected to provide positive benefits, but to a lesser extent. This is true for both Sub-Option 2A or Sub-Option 2B.

7.5.3.1.2.2.1 Sub-Option 2A: Extension of FW 52 Provisions to Large-Mesh Non-Groundfish Trawl Fisheries

Large-mesh Non-groundfish Trawl Fisheries

This sub-option would allow the small AM area to be implemented instead of the large AM areas and could also allow the AM to be removed mid-year if the conditions described in section 4.3.1.2.2.1, are met. These options, described in this document as "Framework 52 provisions", currently only apply to groundfish fisheries. This sub-option would extend these provisions to non-groundfish trawl fisheries.

Under Sub-Option 2A, the AMs would be expected to result in negative economic impacts if they result in:

- Lower stock-specific aggregate catches, due to lack of species availability outside of the AM area during the year gear restrictions are in place;
- Higher variable costs due to lower catch rates for economically important stocks either inside the AM area(s) when using selective gears, or outside the AM area(s) when using traditional gears;
- Higher gear costs associated with rigging and using selective gears.

However, these negative economic impacts are expected to be lesser in magnitude under Sub-Option 2A than under the No Action alternative because the likelihood of the large AM areas being implemented for the full year and the likelihood of the large AM areas being implemented instead of the small AM areas would be reduced, compared to the no action alternative. A reduction in size of the AM area or a reduction in the duration of the AMs would be expected to lessen the negative economic impacts of the AMs.

7.5.3.1.2.2.2 Sub-Option 2B: Modified Gear Restricted Areas

Large-mesh Non-groundfish Trawl Fisheries

As described in section 4.3.1.2.2.2, under Sub-Option 2B, the small AM area would be a seasonal AM. When implemented, it would be in place from September 1 through April 30. It would not be in place during May through August. In addition, the large AM area 1 would be reduced in size as shown in Figure 7in the draft alternatives (dated December 1, 2017).

Under Sub-Option 2B, the AMs would be expected to result in negative economic impacts if they result in:

- Lower stock-specific aggregate catches, due to lack of species availability outside of the AM area during the year gear restrictions are in place;
- Higher variable costs due to lower catch rates for economically important stocks either inside the AM area(s) when using selective gears, or outside the AM area(s) when using traditional gears;
- Higher gear costs associated with rigging and using selective gears.

However, these negative economic impacts are expected to be lesser in magnitude under Sub-Option 2B than under the no action alternative because the likelihood of the large AM areas being implemented for the full year and the likelihood of the large AM areas being implemented instead of the small AM areas would be reduced, compared to the No Action alternative. A reduction in size of the AM area or a reduction in the duration of the AMs would be expected to lessen the negative economic impacts of the AMs.

The size of the large AM area 1 is smaller under sub-option 2B than under Sub-Option 2A. In addition, the small AM area would never be implemented during May-August under Sub-Option 2B. Under Sub-Option 2A, the small AM area could be implemented year-round. For these reasons, although the AMs would still be expected to result in negative economic impacts under Sub-Option 2B, those impacts are expected to be lesser in magnitude than under Sub-Option 2A.

7.5.3.1.3 Atlantic Scallop Fishery Measures

7.5.3.1.3.1 Scallop Fishery AM Implementation Policy

7.5.3.1.3.1.1 Option 1: No Action

Groundfish fishery

No Action would continue to provide positive benefits to the groundfish fishery.

Sea Scallop Fishery

No Action would also result in positive impacts relative to Option 2. Under the Option 2 ACLs, the FY 2018 sub-ACL for SNE/MA yellowtail would be 5mt, a 29mt (78%) decline from FY 2017. Actual catches of SNE/MA yellowtail by the scallop fishery were 64.8mt in FY 2014, 34.6mt in FY2015, and 10.7mt in FY 2016. AMs were not triggered in any of these years. Recent utilization rates of SNE/MA yellowtail flounder in the groundfish fishery (30.6% in FY 2015 and 48.9% in FY 2014) suggests that the total ACL may not be exceeded in FY 2018, even if the sub-ACL in the scallop fishery is. This would mean that the likely threshold of SNE/MA yellowtail catch to trigger scallop fishery AMs would be 51mt (150% of 34mt) under No Action ACLs. If AMs were triggered, the scallop fishery is subject to area closures and/or gear restrictions in the following fishing years. Table 6 summarizes the AM triggers for the four stocks with scallop fishery sub-ACLs.

7.5.3.1.3.1.2 Option 2: Extend the Temporary Change to the Scallop Fishery AM Implementation Policy to the SNE/MA Yellowtail Flounder Stock

Groundfish Fishery

Option 2 would result in negative impacts to the groundfish fishery, as SNE/MA yellowtail flounder is an allocated stock to the groundfish fishery of economic value. This alternative could potentially result in increased incidental catch of yellowtail flounder by the scallop fishery relative to No Action. The SNE/MA yellowtail flounder stock is in poor condition, in need of a rebuilding plan with overfishing occurring and it is overfished. An increase in SNE/MA yellowtail flounder bycatch by the scallop fishery could have a negative impact on stock rebuilding and result in even lower quotas for the groundfish fishery in the future. However, since the change under Option 2 would be temporary and only in place for FY2018, negative impacts relative to No Action would be for one fishing year and would revert to neutral relative to Option 2 in FY2019 and beyond.

Table 1 in) A summary of recent catches of SNE/MA yellowtail flounder by the groundfish fishery relative to the sub-ACL, along with scallop fishery catches relative to the sub-ACL for SNE/MA yellowtail flounder is provided (see Section Biological Impacts in Atlantic Scallop Fishery Measures). Since FY2010, the groundfish fishery has caught between ~30% and 71% of its sub-ACL each year.

Scallop Fishery

Option 2 would result in positive impacts to the scallop fishery. In addition, the scallop fishery would have the same AM triggers in FY2018 for all groundfish stocks in which they have sub-ACLs (Table 6). The removal of one of the triggering mechanisms for AMs during FY2018 could allow for increased fishing effort in Southern New England by the scallop fishery. In a subsequent fishing year, AMs close areas 537, 539, and 613 to the limited access scallop fleet. The length of the closure depends on the SNE/MA yellowtail overage. For example, an overage of 2% or less results in a closure for March-April, while an overage of 19.1% or greater results in a full scallop fishing year closure (March-February). Scallop Framework Adjustment 29 is considering revisions to scallop fishery AMs, which may be gear restrictions or areas closures, and these may further determine impacts to the scallop fishery. However, since the change under Option 2 would be temporary and only in place for FY2018, positive impacts relative to No Action would be for one fishing year and would revert to neutral relative to Option 2 in FY2019 and beyond.

Table 7 shows the catch of SNE/MA yellowtail flounder by the scallop fishery relative to the sub-ACL. Quota transfers occurred from the scallop fishery to the groundfish fishery of SNE/MA yellowtail flounder in FY2013, FY2015, and FY2016, based on projected shortfalls in scallop fishery bycatch. While the scallop fishery sub-ACL was exceeded in 2013, no AMs were triggered since the scallop fishery has been allowed to catch 150% of its sub-ACL if the total ACL is not exceeded.

Table 7 shows that Option 2 would not have impacted the scallop fishery in recent years in terms of avoiding AMs. However, the scallop fishery may have still had some costs associated with modifying fishing behavior to avoid SNE/MA yellowtail flounder.

Table 6 – Current scallop fishery AM triggers for groundfish stocks with scallop sub-ACL

| | AM Trig | gger |
|---------------------|---------------------|----------------------|
| Stock | Sub-ACL + total ACL | 150% sub-ACL or sub- |
| | exceeded | ACL + total ACL |
| | | exceeded |
| GB Yellowtail | x (2017 and 2018) | X |
| SNE/MA Yellowtail | | X |
| Northern Windowpane | x (2017 and 2018) | X |
| Southern Windowpane | X | |

Table 7 - Catch of SNE/MA yellowtail by the scallop fishery relative to the sub-ACL, FYs 2010-2016. *AMs are triggered if 150% of the sub-ACL is exceeded.

| Scallop Fishing Year | SNE/MA Yellowtail Flounder Sub-ACL (mt) for Scallop Fishery | Estimated SNE/MA Yellowtail Flounder Catch (mt) by Scallop Fishery | % Sub- ACL Caught* |
|----------------------------|---|--|--------------------------|
| 2010 | 135 | 113 | 83.7% |
| 2011 | 82 | 110.9 | 135.2% |
| 2012 | 127 | 54 | 42.5% |
| 2013 | 43.6 | 48.6 | 111.4% |
| 2014 | 66 | 64.8 | 98.2% |
| 2015 | 44 | 34.6 | 79.1% |
| 2016 | 17 | 10.7 | 63.9% |

7.5.3.1.4 Recreational Fishery Measures

7.5.3.1.4.1 Georges Bank Cod Accountability Measures for the Recreational Fishery

Information on FY2016 and in-season FY2017 recreational catch and effort are provide in Figures 3-7 and Tables 8-11.

Figure 3- FY2016 Georges Bank cod recreational catch (numbers of fish) by MRIP wave. Wave 2, 2017 MRIP data are preliminary and subject to change.

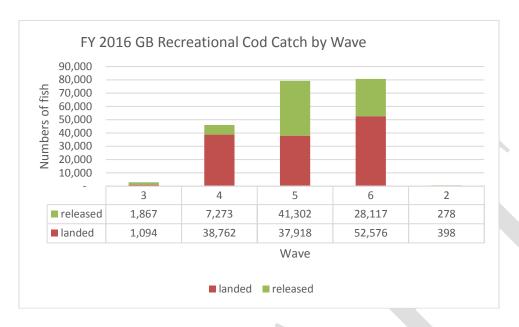


Table 8- FY 2016 GB Recreational Cod Catch by Wave (includes coefficient of variation, the number of intercepts the catch estimates were derived from, and the total number of angler trips that caught cod).

| | Harvest | Harvest | Releases | Releases | Total Catch | Total Catch | Number | Total | Total |
|------|-----------|---------|-----------|----------|--------------------|-------------|------------|---------------------------|--------------|
| | (A+B1) | (A+B1) | (B2) | (B2) | (A+B1+B2) | (A+B1+B2) | of | Angler Trips ¹ | Angler Trips |
| Wave | (numbers) | CV | (numbers) | CV | (numbers) | CV | Intercepts | (numbers) | CV |
| 3 | 1,094 | 0.52 | 1,867 | 0.05 | 2,961 | 0.20 | 4 | 2,479 | 0.24 |
| 4 | 38,762 | 0.41 | 7,273 | 0.58 | 46,035 | 0.41 | 24 | 22,614 | 0.36 |
| 5 | 37,918 | 0.65 | 41,302 | 0.46 | 79,220 | 0.51 | 69 | 22,186 | 0.57 |
| 6 | 52,576 | 0.38 | 28,117 | 0.41 | 80,693 | 0.37 | 53 | 34,452 | 0.35 |
| 2 | 398 | 0.43 | 278 | 0.26 | 676 | 0.30 | 26 | 460 | 0.27 |
| | 130,749 | 0.27 | 78,836 | 0.29 | 209,585 | 0.26 | 176 | 82,191 | 0.23 |

¹ The total number of angler trips that caught cod

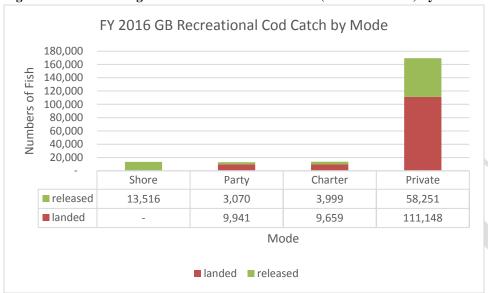


Figure 4- FY2016 Georges Bank cod recreational catch (numbers of fish) by mode.

Table 9- FY 2016 GB Recreational Cod Catch by Mode (includes coefficient of variation, the number of intercepts the catch estimates were derived from, and the total number of angler trips that caught cod).

| | Harvest | Harvest | Releases | Releases | Total Catch | Total Catch | Number | Total | Total |
|---------|-----------|---------|-----------|----------|--------------------|-------------|------------|---------------------------|--------------|
| | (A+B1) | (A+B1) | (B2) | (B2) | (A+B1+B2) | (A+B1+B2) | of | Angler Trips ¹ | Angler Trips |
| Mode | (numbers) | CV | (numbers) | CV | (numbers) | CV | Intercepts | (numbers) | CV |
| Shore | - | 0.00 | 13,516 | 0.88 | 13,516 | 0.88 | 2 | 13,516 | 0.88 |
| Party | 9,941 | 0.12 | 3,070 | 0.15 | 13,011 | 0.11 | 101 | 5,066 | 0.28 |
| Charter | 9,659 | 0.14 | 3,999 | 0.34 | 13,659 | 0.15 | 30 | 7,677 | 0.23 |
| Private | 111,148 | 0.32 | 58,251 | 0.33 | 169,399 | 0.31 | 43 | 55,932 | 0.27 |
| | 130,749 | 0.27 | 78,836 | 0.29 | 209,585 | 0.26 | 176 | 82,191 | 0.23 |

¹ The total number of angler trips that caught cod

Figure 5- FY2016 Georges Bank cod recreational catch frequencies (number of fish caught/trip) as a percentage of number of angler trips.

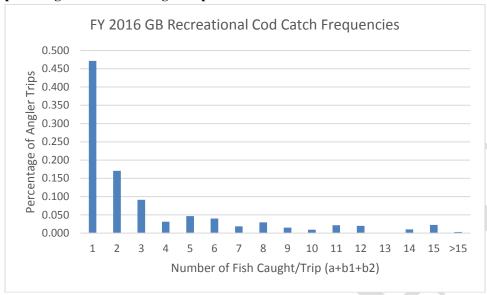


Figure 6-FY2016 Georges Bank cod recreational landings frequencies (number of fish landed/trip) as a percentage of number of angler trips.

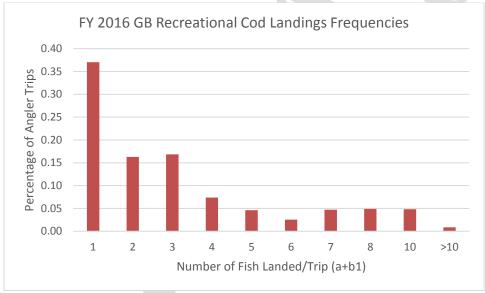


Figure 7- -FY2016 Georges Bank cod recreational landings size frequencies (size of fish in inches) as a proportion of total catch.

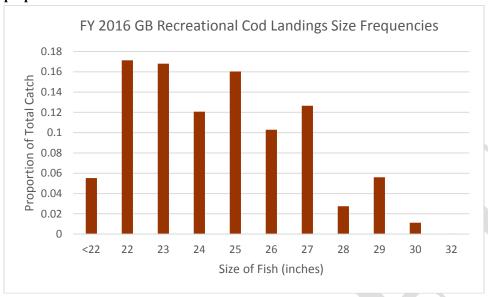


Table 10-Comparison of FY2016 and FY2017 Georges Bank cod recreational catch (waves 3, 4).

| | | | | | | Total | | |
|------|------|-----------|---------|-----------|----------|-----------|--------------------|------------|
| | | Harvest | Harvest | Releases | Releases | Catch | Total Catch | Number |
| | | (A+B1) | (A+B1) | (B2) | (B2) | (A+B1+B2) | (A+B1+B2) | of |
| Year | Wave | (numbers) | CV | (numbers) | CV | (numbers) | CV | Intercepts |
| | | | | | | | | |
| 2016 | 3 | 1,094 | 0.52 | 1,867 | 0.05 | 2,961 | 0.20 | 4 |
| | | | | | | | | |
| 2016 | 4 | 38,762 | 0.41 | 7,273 | 0.58 | 46,035 | 0.41 | 15 |
| | | | | | | | | |
| | | 39,856 | 0.39 | 9,140 | 0.46 | 48,996 | 0.39 | 19 |
| | | | | | | | | |
| | | | | | | | | |
| 2017 | 3 | 5,968 | 0.80 | 3,684 | 0.58 | 9,652 | 0.57 | 8 |
| | | | | | | | | |
| 2017 | 4 | 3,701 | 0.83 | 122 | 0.76 | 3,823 | 0.81 | 7 |
| | | | | | | | | |
| | | 9,669 | 0.59 | 3,806 | 0.56 | 13,475 | 0.47 | 15 |

7.5.3.1.4.1.1 Option 1: No Action

Commercial groundfish fishery

Fisheries with ACLs will continue to be held accountable for any overages of the total ACLs. The commercial fishery is the only component with an ACL for GB cod. Catches of GB cod by the recreational fishery in FY2016 lead to overages. Option 1 would result in negative impacts to the commercial groundfish fishery when compared with Option 2.

Recreational groundfish fishery

Catches of GB cod by the recreational fishery in FY2016 lead to ACL overages. Changes to the recreational management measures require a Council action. Option 1 would result in neutral impacts to the recreational groundfish fishery when compared to the status quo, and positive impacts when compared to Option 2, as measures would likely be less restrictive under Option 1.

7.5.3.1.4.1.2 Option 2: Temporary Administrative Measure to Allow the Regional Administrator Authority to Adjust the Recreational Measures for Georges Bank Cod

Commercial groundfish fishery

Fisheries with ACLs will continue to be held accountable for any overages of the total ACLs. The commercial fishery is the only component with an ACL. Catches of GB cod by the recreational fishery in FY2016 lead to overages. Option 2 would allow for management measures to be adjusted in FY2018 and FY2019 by the Regional Administrator to stay below a catch target of 138.4mt. Option 2 would likely lead to positive impacts relative to Option 1 for the commercial groundfish fishery, if recreational catches remain below the catch target.

Recreational groundfish fishery

Catches of GB cod by the recreational fishery in FY2016 lead to overages. Changes to the recreational management measures require a Council action. Option 2 would allow for management measures to be adjusted in FY2018 and FY2019 by the Regional Administrator to stay below a catch target of 138.4mt. Option 2 would likely lead to negative impacts relative to Option 1 for the recreational groundfish fishery. Measures to date under consideration include increasing the minimum fish size up to 24 inches (from 22 inches) and implementing a 10-fish bag limit for all anglers - party, charter, and private modes (from a 10-fish bag limit on private mode and no limit on party/charter mode).