



**Mid-Atlantic Fishery Management Council**  
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## MEMORANDUM

**Date:** November 10, 2022  
**To:** Chris Moore, Executive Director  
**From:** Hannah Hart, Staff  
**Subject:** Scup Recreational Management Measures for 2023

### Summary

The information in this memo is intended to assist the Monitoring Committee (MC), Advisory Panels, the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Management Board (Board) in developing recommendations for scup recreational measures for 2023.

2023 will be the first year that measures will be set using the Percent Change Approach, which is pending implementation through the Recreational Harvest Control Rule Framework/Addenda. Under the Percent Change Approach, recreational measures will no longer aim to achieve but not exceed the recreational harvest limit (RHL). Instead, measures will aim to achieve a different level of harvest, which will be defined based on expectations of 2023 harvest under 2022 measures compared to the 2023 RHL as well as considerations about stock biomass.

Each year, the MC is tasked with recommending recreational management measures (possession limits, size limits, and open/closed seasons) for the upcoming year. For scup, the Council and Board agree to federal waters recreational management measures for the upcoming year that apply throughout federal waters from Maine through North Carolina. State waters measures are typically determined separately through the Commission process; however, the combination of both federal waters and state waters measures must achieve the specified percent change as defined through the Percent Change Approach.

Improved statistical modeling tools are available for setting 2023 measures, including a Recreational Demand Model (RDM) and a Recreational Fleet Dynamics Model (RFDM). The two models are described on page 11. As described in more detail below, the 2023 RHL is below five of six potential confidence intervals (CIs) around estimated 2023 harvest under 2022 measures using the RDM and RFDM. Given the most recent estimate of spawning stock biomass is more than 150% of the target level, the Percent Change Approach requires a 10% reduction in harvest relative to estimated 2023 harvest under 2022 measures.

The MC should recommend 2023 federal waters measures and can also discuss considerations for adjustments to state measures to achieve the 10% reduction in harvest required. Additional RDM and RFDM model runs may be necessary to determine the appropriate 2023 measures needed to achieve the required reduction in harvest. As described in more detail below, the RDM results suggest decreasing the possession limit to 15 fish in state and federal waters is not expected to achieve the required 10% reduction necessary for 2023, and increasing the minimum size limit by 1 inch in state and federal waters would reduce harvest by 24%, which is notably more than the 10% reduction required.

### **Overview of Percent Change Approach**

In June 2022, the Council and the Policy Board approved a new process for setting recreational measures called the Percent Change Approach.<sup>1</sup> They agreed to use this approach for summer flounder, scup, and black sea bass starting with 2023 measures. Under this approach, measures will aim to achieve a specified percent change in harvest compared to the expectation of harvest in the upcoming year(s) under current quo measures. Unlike the previous process, the recreational bag, size, and season limits will no longer aim to achieve but not exceed the RHL. Instead, measures will aim to achieve a different level of harvest, which will vary based on the following two factors:

- 1) A confidence interval (CI) around an estimate of expected harvest in the upcoming two years under current measures compared to the average RHL for the upcoming two years and
- 2) Biomass compared to the target level, as defined by the most recent stock assessment.

The resulting percent change in harvest that measures should aim to achieve is summarized in Table 1. Information about how to apply this process to scup for 2023 measures is described in more detail in later sections of the document.

It is worth noting that this process is intended to allow recreational measures to remain unchanged across two years, aligned with the timing of updated management track stock assessments, which are expected to be available every other year. However, measures will be set on a one-year cycle for 2023 given that 2023 is an interim year for the management track assessments. This process will be used for a two-year cycle starting with 2024-2025.

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<sup>1</sup> See action documents and additional information at <https://www.mafmc.org/actions/hcr-framework-addenda>.

Table 1: Process for determining appropriate percent change in expected harvest when developing measures under the Percent Change Approach.

<i>Column 1</i> <b>Future RHL vs Estimated Harvest</b>	<i>Column 2</i> <b>Biomass compared to target level (SSB/SSB<sub>MSY</sub>)</b>	<i>Column 3</i> <b>Change in Harvest</b>
Future 2-year average RHL is <b>greater than</b> the upper bound of the harvest estimate CI (harvest expected to be lower than the RHL)	<b>Very high</b> (greater than 150% of target)	<b>Liberalization</b> percent equal to difference between harvest estimate and 2-year avg. RHL, not to exceed 40%
	<b>High</b> (at least the target level, but no higher than 150% of target)	<b>Liberalization</b> percent equal to difference between harvest estimate and 2-year avg. RHL, not to exceed 20%
	<b>Low</b> (below the target stock size)	<b>Liberalization: 10%</b>
Future 2-year average RHL is <b>within</b> harvest estimate CI (harvest expected to be close to the RHL)	<b>Very high</b> (greater than 150% of target)	<b>Liberalization: 10%</b>
	<b>High</b> (at least the target level, but no higher than 150% of target)	<b>No liberalization or reduction: 0%</b>
	<b>Low</b> (below the target stock size)	<b>Reduction: 10%</b>
Future 2-year average RHL is <b>less than</b> the lower bound of the harvest estimate CI (harvest is expected to exceed the RHL)	<b>Very high</b> (greater than 150% of target)	<b>Reduction: 10%</b>
	<b>High</b> (at least the target level, but no higher than 150% of target)	<b>Reduction</b> percent equal to difference between harvest estimate and 2-year avg. RHL, not to exceed 20%
	<b>Low</b> (below the target stock size)	<b>Reduction</b> percent equal to difference between harvest estimate and 2-year avg. RHL, not to exceed 40%

### Past Management Measures

Scup RHLs were first implemented in 1996. Since then, the RHL varied from a low of 1.24 million pounds in 1999 and 2000 to a high of 9.27 which is the expected RHL for 2023. Performance relative to RHLs through 2019 can only be evaluated using pre-revision ("old") MRIP data, since past RHLs were set using assessments that incorporated the previous MRIP time series.

Until 2002, the recreational scup fishery was managed with coastwide measures as dictated by the FMP at the time. These measures included a common minimum fish size, possession limit, and open season that were implemented in both state and federal waters. Since 2003, the Commission has applied a regional

management approach to recreational scup fisheries in state waters, where New York, Rhode Island, Connecticut, and Massachusetts develop regulations intended to achieve 97% of the RHL. Federal waters regulations have been updated occasionally since 2003; however, from 2015 – 2021 federal waters measures remained unchanged (Table 2).

The Council and Board agreed to leave the recreational scup measures in all states and federal waters unchanged in 2020 and 2021 despite expected RHL overages. This was viewed as a temporary solution to allow more time to consider how to fully transition the management system to use of the revised Marine Recreational Information Program (MRIP) data (see the next section of this document for more details), including further development of the then ongoing Commercial/Recreational Allocation Amendment and the Recreational Harvest Control Rule Framework/Addenda.

However, due to recreational overages in 2019-2020 and expected overages in 2021 the Council and Board required a 1-inch increase to the scup recreational minimum size in state and federal waters for 2022. In federal waters, this resulted in a 10-inch total length minimum size limit (Table 2). Management measures in state waters vary by state, mode (e.g., private, for-hire), and season, but like federal waters, the minimum size limit in each state was increased by 1 inch resulting in a 10-inch size limit in most northern states and a 9-inch minimum size limit in most southern states (Table 3). Implementation of the state specific 1-inch minimum size limit increase varied by state, but all states regulations were updated prior to July 1, 2022.

**Table 2:** Summary of federal management measures for the scup recreational fishery, 1997-2023. ABCs, TACs, ACLs, RHLs, and harvest are in millions of pounds. Recreational harvest values are for Maine through North Carolina and old and revised MRIP estimates are shown.

Year	TAC/ABC	Rec. ACL	RHL	Rec. harvest (Old MRIP)	% over/under RHL <sup>a</sup>	Rec. harvest (New MRIP)	Bag limit (# of fish)	Size limit (inches, total length)	Open season
1997	9.10	-	1.95	1.20	-38%	2.54	-	7	1/1 - 12/31
1998	7.28	-	1.55	0.87	-44%	1.82	-	7	1/1 - 12/31
1999	5.92	-	1.24	1.89	+52%	4.63	-	7	1/1 - 12/31
2000	5.92	-	1.24	5.44	+339%	11.39	-	-	1/1 - 12/31
2001	8.37	-	1.76	4.26	+142%	9.77	50	9	8/15 - 10/31
2002	12.92	-	2.71	3.62	+34%	6.23	20	10	7/1 - 10/2
2003	18.65	-	4.01	8.48	+111%	17.21	50	10	1/1 - 2/28 7/1 - 11/30
2004	18.65	-	3.99	7.28	+82%	12.83	50	10	1/1 - 2/28 9/7 - 11/30
2005	18.65	-	3.96	2.69	-32%	4.30	50	10	1/1 - 2/28 9/18 - 11/30
2006	19.79	-	3.99	3.72	-7%	5.93	50	10	1/1 - 2/28 9/18 - 11/30
2007	13.97	-	2.74	4.56	+66%	7.10	50	10	1/1 - 2/28 9/18 - 11/30
2008	9.9	-	1.83	3.79	+107%	5.76	15	10.5	1/1 - 2/28 9/18 - 11/30
2009	15.54	-	2.59	3.23	+25%	6.28	15	10.5	1/1 - 2/28 10/1 - 10/31
2010	17.09	-	3.01	5.97	+98%	12.48	10	10.5	1/1 - 2/28 10/1 - 10/31
2011	31.92	-	5.74	3.67	-36%	10.32	10	10.5	6/6 - 9/26
2012	40.88	31.89	8.45	4.17	-51%	8.27	20	10.5	1/1 - 12/31
2013	38.71	30.19	7.55	5.37	-29%	12.57	30	10	1/1 - 12/31
2014	35.99	28.07	7.03	4.43	-37%	9.84	30	9	1/1 - 12/31
2015	33.77	26.35	6.8	4.41	-35%	11.93	50	9	1/1 - 12/31
2016	31.11	6.84	6.09	4.26	-30%	10.00	50	9	1/1 - 12/31
2017	28.4	6.25	5.50	5.42	-1%	13.54	50	9	1/1 - 12/31
2018	39.14	8.61	7.37	5.61	-24%	12.98	50	9	1/1 - 12/31
2019	36.43	8.01	7.37	5.40 <sup>b</sup>	-27%	14.12	50	9	1/1 - 12/31
2020	35.77	7.87	6.51	N/A	+98%	12.91	50	9	1/1 - 12/31
2021	34.81	7.66	6.07	N/A	+174	16.62	50	9	1/1 - 12/31
2022	32.11	7.06	6.08	N/A	-	-	50	10	1/1 - 12/31
2023 <sup>c</sup>	29.67	10.39	9.27	N/A	-	-	TBD	TBD	TBD

<sup>a</sup> Based on a comparison with old MRIP estimates through 2019 and new MRIP estimates starting in 2020

<sup>b</sup> Old MRIP estimates provided to the National Marine Fisheries Service Greater Atlantic Regional Fisheries Office by the Northeast Fisheries Science Center

<sup>c</sup> Pending approval and implementation by NMFS.

**Table 3:** State recreational fishing measures for scup in 2021 and 2022. Note: the minimum size limit was the only regulation updated in 2022 and timing of implementation varied by state.

State	2021 Minimum Size (inches)	2022 Minimum Size (inches)	Possession Limit	Open Season
MA (private & shore)	9	10	30 fish; 150 fish/vessel with 5+ anglers on board	January 1-December 31
MA (party/charter)	9	10	30 fish	January 1-April 30; July 1-December 31
			50 fish	May 1-June 30
RI (private & shore)	9	10	30 fish	January 1-December 31
RI shore program (7 designated shore sites)	8	9		
RI (party/charter)	9	10	30 fish	January 1-August 31; November 1-December 31
			50 fish	September 1-October 31
CT (private & shore)	9	10	30 fish	January 1-December 31
CT shore program (45 designated shore sites)	8	9		
CT (party/charter)	9	10	30 fish	January 1-August 31; November 1-December 31
			50 fish	September 1-October 31
NY (private & shore)	9	10	30 fish	January 1-December 31
NY (party/charter)	9	10	30 fish	January 1-August 31; November 1-December 31
			50 fish	September 1- October 31
NJ	9	10	50 fish	January 1- December 31
DE	8	9	50 fish	January 1-December 31
MD	8	9	50 fish	January 1-December 31
VA	8	9	30 fish	January 1-December 31
NC, North of Cape Hatteras (N of 35° 15'N)	8	9	50 fish	January 1-December 31

### **Recreational Catch and Harvest Trends**

In July 2018, the Marine Recreational Information Program (MRIP) released revisions to their time series of recreational catch and landings estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology (i.e., a transition from a

telephone-based effort survey to a mail-based effort survey). Recreational data included in this memo reflect revised MRIP data except where otherwise stated.

MRIP estimates for 2020 were impacted by the COVID-19 pandemic due to temporary suspension of the Access Point Angler Intercept Survey (APAIS) and headboat sampling. Some minor impacts continued into 2021. The National Marine Fisheries Service (NMFS) used imputation methods to fill gaps in 2020-2021 data with data collected in 2018 and 2019. For example, the 2020 scup harvest estimate for Maine through Virginia combined was developed using approximately 25% imputed data and the 2021 estimate used 2% imputed data. For additional information, see the information on 2020 recreational harvest estimates posted at: <https://www.mafmc.org/council-events/2021/sfsbsb-mc-july27>.

Estimates of recreational dead discards in weight for 2020 and 2021 using the typical estimation methods are not currently available. The typical method relies on age and length information that is not currently available for these more recent years. As such, GARFO generated 2020-2021 estimates of dead discards in weight by applying the average weight of discarded fish in 2019 to the estimates of dead discards in number of fish generated by MRIP for 2020 and 2021.<sup>2</sup>

Table 4 provides the annual MRIP time series of recreational harvest (in number of fish and weight), dead discards (in weight), and catch (in number of fish) for 2008-2021, as well as the estimates for waves 1-4 for 2022. Since 1981, estimated recreational scup catch fluctuated from a peak of 37.31 million fish in 1986 to a low of 6.60 million fish in 1997. Estimated harvest fluctuated from a high of 14.18 million pounds (about 30.43 million scup) in 1986 to a low of 1.82 million pounds (about 2.74 million scup) in 1998. In 2021, recreational harvest was about 16.60 million fish (about 16.62 million pounds), and approximately 31.70 million scup were caught, with a release rate of 48% (Table 4).

2022 recreational catch and landings data from MRIP are currently available as preliminary estimates for the first four waves (January – August). Preliminary MRIP estimates indicate that through August 2022, 27.64 million scup were caught and 14.18 million scup (corresponding to about 13.72 million pounds) were harvested from Maine through North Carolina (Table 4). Therefore, even with the increased minimum size limit implemented in 2022, on average, preliminary 2022 wave 1 – 4 estimates are about 3.5 million pounds greater than the 2019-2021 average wave 1 – 4 estimates.

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<sup>2</sup> Specifically, the 2019 average weight of discarded fish was calculated using recent assessment update information. This average weight (0.60 lbs.) was applied to the proportion of MRIP live discards in number of fish (MRIP “B2s”) that are assumed to die after being discarded (15% for scup).

**Table 4:** Recreational scup catch (i.e., harvest and live and dead discards) and harvest by year, ME - NC, 2012-2022 based on new MRIP estimates. 2022 values are preliminary and are for waves 1-4 only.

<b>Year</b>	<b>Catch</b> (mil of fish)	<b>Harvest</b> (mil of fish)	<b>Harvest</b> (mil lbs.)	<b>Dead discards</b> (mil lbs.)	<b>% Released</b> <b>(released</b> <b>alive)</b>	<b>Avg. weight</b> <b>of landed</b> <b>fish (mil lbs.)</b>
2012	21.24	7.33	8.27	1.40	65%	1.13
2013	25.79	11.49	12.57	1.25	55%	1.09
2014	20.37	9.17	9.84	1.06	55%	1.07
2015	24.87	11.33	11.93	1.28	54%	1.05
2016	31.49	9.14	10.00	1.90	71%	1.09
2017	41.20	13.84	13.54	2.38	66%	0.98
2018	30.37	14.55	12.98	1.42	52%	0.89
2019	28.67	14.95	14.12	1.23	48%	0.94
2020	27.27	14.49	12.91	1.15	47%	0.89
2021	31.70	16.60	16.62	1.36	48%	0.99
2022 (wave 1-4)	27.64	14.18	13.72	--	49%	0.97

The majority of scup harvest takes place during waves 3-5; however, harvest by state by wave varies across the year. For example, most of the scup harvest in North Carolina takes place during wave 2 and the majority of scup harvest in Rhode Island, Connecticut, and New York occurred during wave 4 (Table 5). Total landings by state in recent years are shown in Table 6, including full year estimates for 2017 – 2021 and wave 1 – 4 estimates for 2022.

On average, recreational scup harvest (in pounds) from 2017 – 2021 accounted for about 6% in federal waters and 94% in state waters (Figure 1). During 2017 – 2021 about 11% of recreational harvest was from party/charter vessels, 28% was from shore-based anglers, and 61% was from private/rental boats (Figure 2).

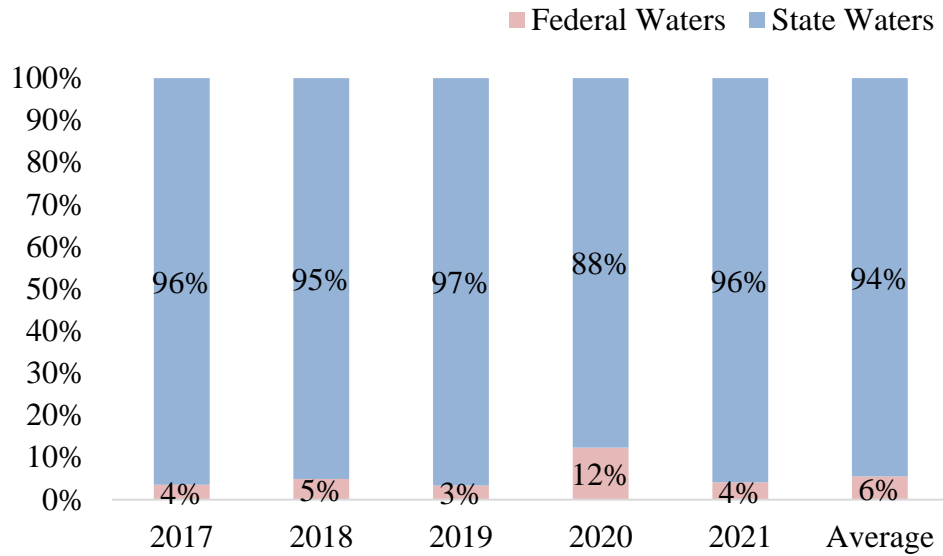


**Table 5:** Percent of scup harvest (in weight) by wave for each state in 2019 – 2021, based on MRIP data. Values may not add to 100% due to rounding. North Carolina is the only state in the management unit which conducts MRIP sampling during wave 1.

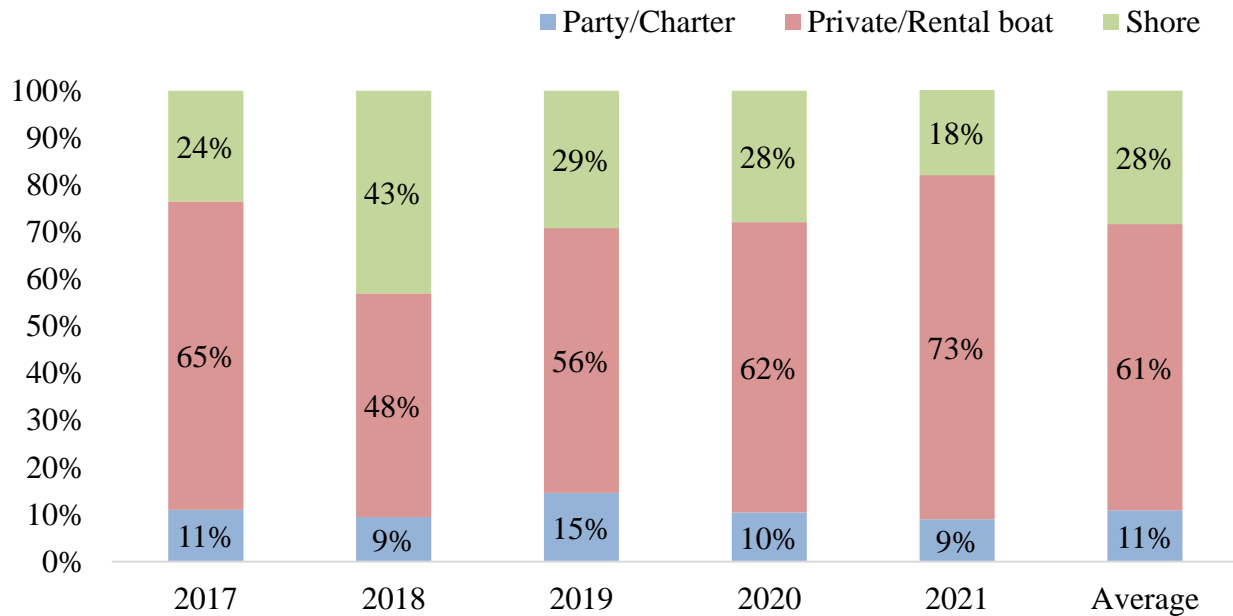
State	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
ME	--	--	--	--	--	--
NH	--	--	--	--	--	--
MA	0%	22%	43%	20%	15%	0%
RI	0%	0%	19%	44%	36%	1%
CT	0%	0%	23%	43%	33%	0%
NY	0%	0%	32%	42%	25%	2%
NJ	0%	0%	0%	45%	55%	1%
DE	0%	0%	0%	0%	1%	99%
MD	0%	0%	0%	0%	8%	92%
VA	0%	0%	0%	0%	100%	0%
NC	0%	39%	28%	17%	14%	1%
<b>Total</b>	<b>0%</b>	<b>4%</b>	<b>29%</b>	<b>39%</b>	<b>28%</b>	<b>1%</b>

**Table 6:** Recreational scup harvest (in pounds) by state for all waves (January – December) 2017 – 2021. 2022 values are preliminary estimate through wave 4 (January – August).

State	2017	2018	2019	2020	2021	2022 (w1-4)
ME	0	0	0	0	0	0
NH	2,156	0	0	0	0	0
MA	2,363,922	3,021,958	1,924,202	1,174,791	3,763,515	1,994,630
RI	1,113,035	2,030,259	2,856,461	1,330,398	2,467,933	2,362,071
CT	1,712,421	2,574,308	2,242,549	2,951,959	2,856,535	1,162,622
NY	6,626,059	4,906,041	6,970,872	6,253,478	7,177,771	8,150,145
NJ	1,708,354	443,700	118,832	1,200,942	194,090	47,087
DE	118	362	0	316	1,179	0
MD	6	369	444	578	331	0
VA	0	0	229	0	157,455	0
NC	508	420	2,637	1,346	2,831	1,302
<b>Total</b>	<b>13,526,579</b>	<b>12,977,417</b>	<b>14,116,226</b>	<b>12,913,808</b>	<b>16,621,640</b>	<b>13,717,857</b>



**Figure 1:** Proportion of 2017 – 2021 recreational harvest (in pounds) in state and federal waters, ME-NC. *Note: area information is self-reported based on the area where the majority of fishing activity occurred on each trip.*



**Figure 2:** Proportion of 2017 – 2021 recreational harvest (in pounds).

## **Percent Change in Harvest Needed for 2023**

### *Comparison of 2023 RHL to Expected 2023 Harvest Under Current Measures*

As previously stated, 2023 scup recreational measures will be set using the Percent Change Approach. The first step will be to generate an estimate of expected 2023 harvest under status quo (i.e., 2022) measures, with an associated confidence interval, and comparing that CI to the 2023 RHL (i.e., 9.27 million pounds). The Percent Change Approach does not define specific methods for calculating CIs. The MC should provide advice to the Council and Board on the appropriate CI for 2023.

In the past, expected harvest under status quo measures has been estimated by projecting harvest for the current year<sup>3</sup> and assuming that harvest in the following year would remain at similar levels if measures remained unchanged. This year, improved methods of estimating future harvest are available. The Council and Commission have supported development of two statistical models to predict the impacts of recreational bag, size, and season limits on recreational harvest and discards of summer flounder, scup, and black sea bass.

The Northeast Fisheries Science Center has developed the **Recreational Demand Model (RDM)** for these species. The scup version of this model currently accounts for the impacts of regulations, population size, and angler preferences on harvest and discards. Year class strength is based on stock assessment projections and angler preferences are based on a survey of anglers from Maine through Virginia. Additional information about this model can be found in this overview document: <https://www.mafmc.org/s/fluke-RDM-overview-final-report.pdf>.

Additionally, the **Recreational Fleet Dynamics Model (RFDM)** is being developed by scientists at the Rhode Island Department of Environmental Management and uses a shape constrained additive model to predict harvest and discards based on management measures. Covariates in the model include year, minimum size, wave, state, bag limit, spawning stock biomass, and the RHL. An R Shiny App is being developed for this model to allow the MC to modify management measures and view the resulting predicted harvest and discards. Additional information about this model can be found in this overview document: [https://www.mafmc.org/s/RFDM\\_CompleteModel\\_WriteUps\\_Oct2022\\_FinalDraftclean.pdf](https://www.mafmc.org/s/RFDM_CompleteModel_WriteUps_Oct2022_FinalDraftclean.pdf)

Both models allow for consideration of varying management measures at the state and wave level. Both models were reviewed by the Council's Scientific and Statistical Committee in September 2021<sup>4</sup> and have been improved since that time based on their recommendations.

Table 7 shows RDM and RFDM estimates of 2023 scup harvest under 2022 measures as well as associated CIs. Model results suggest that under 2022 measures, projected harvest in 2023 would be 17.21 million pounds using the RDM and 16.84 million pounds using the RFDM. The 2023 RHL is **below** the lower bound of the 2023 harvest estimate CI under all but one of the six CIs shown in Table 7 (i.e., harvest is expected to be greater than the RHL). Under a 95% CI, results from the RFDM suggest the 2023 RHL is greater than only a very small proportion of the lower

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<sup>3</sup> Staff typically project current year harvest using preliminary wave 1-4 data and assuming the same proportion of catch and landings by wave as in the previous year (with some adjustments to this methodology as appropriate).

<sup>4</sup> The final report from the SSC review is available at [https://www.mafmc.org/s/05\\_Rec-Model-Peer-Review-Reports.pdf](https://www.mafmc.org/s/05_Rec-Model-Peer-Review-Reports.pdf).

bound of the CI (Table 7). This is the widest of the CIs shown in Table 7 and may not be appropriate for use in management under the Percent Change Approach.

Council staff recommend use of the 80% CI and caution against use of the higher percentage CIs shown in Table 7. The Recreational Harvest Control Rule Framework/Addenda Fishery Management Action Team/Plan Development Team (FMAT/PDT) recommended use of an 80% CI under the Percent Change Approach based on an analysis of several years of MRIP data for each species. The FMAT/PDT agreed that an 80% CI would be appropriate in this context given variability in MRIP data from year to year, even under unchanged measures. A higher percentage CI would result in a wider range of values, which may not be appropriate given how the CI would be used in management under the Percent Change Approach. The FMAT/PDT made this recommendation prior to availability of preliminary results from the RDM and RFDM. Considerations about variability and uncertainty in projections of future harvest may differ under these models (e.g., as more variables are incorporated); however, because MRIP is a primary data source in these models, the rationale behind the 80% CI is still appropriate. In addition, the RDM and RFDM are expected to generate more accurate predictions of harvest compared to past methods, as they use a statistical modeling approach to account for more variables than the MC has traditionally been able to consider when using only MRIP data. Therefore, it would not be appropriate to use a CI resulting in a wider range of values than the 80% CI recommended by the FMAT/PDT based on their analysis of MRIP data.

Under a higher percent CI, the wider range of values is more likely to encompass the “true” harvest, but this also creates a range around a harvest estimate which is less meaningful for management. For example, the very wide ranges of expected harvest under the 95% CIs may not be realistic estimates of 2023 harvest. This creates a higher likelihood of ending up in a Percent Change Approach bin which is inappropriate for the “true” harvest. This could result in a required liberalization when a reduction is more appropriate, or vice versa, depending on the circumstances. A lower percentage CI may be especially appropriate for 2023 given this is the first year of using these models and applying the Percent Change Approach.

Based on how the values shown in Table 7 would be used under the Percent Change Approach (Table 1), five of the six CIs would result in the same outcome for scup in 2023 (i.e., a 10% reduction).

For all these reasons, **staff recommend using an 80% CI in the Percent Change Approach for 2023.** Staff recommend use of the same percentage CI across summer flounder, scup, and black sea bass for 2023. In addition, staff recommend the MC have additional discussions in 2023 to develop a more consistent approach to application of CIs under the Percent Change Approach for all applicable species in future years.

**Table 7:** RDM and RFDM estimates of 2023 harvest under 2022 measures and associated CIs. All values are in millions of pounds. The RFDM provides estimates in numbers of fish, which were converted to pounds based on average weight of harvested fish in 2019 from MRIP data.

Model	Model estimate for 2023 harvest	95% CI	90% CI	80% CI	2023 RHL
RDM	17.21 (median)	10.75 – 26.68	11.98 – 24.94	13.56 – 22.68	9.27
RFDM	16.84 (median)	8.21 – 31.38	9.38 – 28.10	10.73 – 25.68	

### *Scup Stock Status*

According to the 2021 management track stock assessment<sup>5</sup> scup is about 2 times greater than the target stock size (estimated at 196% of the spawning stock biomass target). This put scup in the “**very high**” stock size category for the percent change approach (Table 1, Column 2).

### *Resulting Percent Change and Harvest Target*

Applying the expected harvest under status quo measures using 5 of the 6 CIs shown in Table 7 and the most recent stock status results in a **10% reduction** in harvest for scup for 2023 (Table 1, Column 3). This change in harvest is relative to projected 2023 harvest under 2022 measures. Assuming the projected 2023 harvest under 2022 measures referenced above (17.21 or 16.84 million pounds), the **resulting harvest target for scup in 2023 would be about 15.49 million pounds or 15.16 million pounds depending on the model used.**

The MC should provide recommendations to the Council and Board on which harvest target is most appropriate. This should include a recommendation for a preferred model for 2023 (i.e., the RDM or RFDM), if appropriate. In making these recommendations, the MC should consider how the models may be used in subsequent steps of the measures setting process, including for setting state waters measures. Given that the two models produce slightly different results, it may not be appropriate to use one model for some parts of the process and the other model for subsequent steps.

As described in the staff recommendation section below, further model runs are needed to evaluate the management measures which may be appropriate to achieve these target levels of harvest. Additional information may be available prior to the November 15, 2022 MC meeting.

### **Accountability Measures**

Federal regulations include reactive accountability measures (AMs) for when the recreational scup ACL is exceeded. This can include paybacks of ACL overages depending on stock status and the magnitude of the overage, as described below. ACL overages in the recreational fishery are evaluated by comparing the most recent 3-year average recreational ACL to the most recent 3-year average of recreational dead catch (i.e., landings and dead discards). If average dead catch exceeds the average ACL, then the appropriate AM is determined based on the criteria listed below. This reflects minor revisions to the AMs made through the Recreational Harvest Control Rule Framework/Addenda.

1. If the stock is overfished ( $B < \frac{1}{2} B_{MSY}$ ), under a rebuilding plan, or the stock status is unknown: The exact amount, in pounds, by which the most recent year’s recreational ACL has been exceeded, will be deducted in the following fishing year, or as soon as possible once catch data are available. This payback may be evenly spread over two years if doing so allows for use of identical recreational management measures across the upcoming two years.

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<sup>5</sup> 60<sup>th</sup> Northeast Stock Assessment Workshop (2015) assessment report and peer review summaries are available at: <https://www.nefsc.noaa.gov/saw/reports.html>

2. If biomass is above the threshold, but below the target ( $\frac{1}{2} B_{MSY} < B < B_{MSY}$ ), and the stock is not under a rebuilding plan:
  - If only the recreational ACL has been exceeded, then adjustments to the recreational management measures (bag, size, and seasonal limits) would be made in the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measures and the conditions that precipitated the overage.
  - If the most recent estimate of total fishing mortality exceeds  $F_{MSY}$  (or the proxy), then an adjustment to the recreational ACT will be made as soon as possible as a payback that will be scaled based on stock biomass. The calculation for the payback amount in this case is: (overage amount) \*  $(B_{msy}-B)/\frac{1}{2} B_{msy}$ . This payback may be evenly spread over two years if doing so allows for use of identical recreational measures across the upcoming two years. If an estimate of total fishing mortality is not available for the most recent complete year of catch data, then a comparison of total catch relative to the ABC will be used.
3. If biomass is above the target ( $B > B_{MSY}$ ): Adjustments to the recreational management measures (bag, size, and seasonal limits) would be considered for the following year, or as soon as possible once catch data are available. These adjustments would take into account the performance of the measures and the conditions that precipitated the overage.

Based on a comparison of 2019-2021 average recreational dead catch to the 2019-2021 average ACLs, recreational AMs have been triggered for scup (Table 8). Given scup biomass is above the biomass target, the regulations require adjustments to the recreational measures. The regulations do not specify how the measures should be modified.

Recreational measures for scup were restricted in 2022 with the goal of reducing harvest by 33% compared to 2019-2021 average harvest. These restrictions included a 1-inch size increase to the minimum size limit in federal and state waters and were made in response to RHL and recreational ACL overages in prior years. These changes were not expected to prevent an RHL overage in 2022, and instead were intended to bring harvest closer to the RHL while considering resulting socioeconomic impacts if the full reduction was applied. These restrictions are not accounted for in the 2019-2021 comparisons which triggered an AM for 2023. The impacts of the 2022 restrictions on harvest cannot be fully evaluated with currently available preliminary partial year MRIP data. It is also worth noting that several states did not implement the restrictions until mid-year in 2022; therefore, the restrictions may not have their full intended effect in 2022.

On October 20, 2022, the NMFS Greater Atlantic Regional Fisheries Office Regional Administrator sent a letter to the Council stating that given actions taken by the Council and Commission over the past year, including revisions to the commercial/recreational allocation, the 1-inch increase in the recreational minimum size limit in federal waters and in all states for 2022, and final action on the Recreational Harvest Control Rule Framework/Addenda, no additional action, beyond changes which may be required through the Percent Change Approach, is needed to address the triggering of an AM for scup.

As noted above, based on the results of the RDM and RFDM using an 80% or 90% CI, the Percent Change Approach will require a 10% reduction in scup harvest in 2023 compared to estimated 2023 harvest under 2022 measures. Given all these considerations, Council staff recommend that no additional restrictions beyond this 10% reduction be implemented for scup in 2023 due to the triggering of an AM.

As previously described, Council staff think it would be inappropriate to use a 95% CI. In addition to the concerns previous described, use of a 95% CI would result in a 10% liberalization under the Percent Change Approach, which may not be justifiable given the triggering of AMs.

**Table 8:** Evaluation of scup recreational AMs using the 2019-2021 average recreational ACL compared to the 2019-2021 average recreational dead catch.

	<b>Recreational Harvest (mil lbs.)</b>	<b>Recreational Dead Discards (mil lbs.)</b>	<b>Total Dead Recreational Catch (mil lbs.)</b>	<b>Recreational ACL (mil lbs.)</b>	<b>% Over/ Under ACL</b>
<b>2019<sup>a</sup></b>	5.41	0.41	5.82	8.01	-27%
<b>2020</b>	12.91 <sup>c</sup>	1.15 <sup>b</sup>	14.06	7.87	+79%
<b>2021</b>	16.62	1.36 <sup>b</sup>	17.98	7.66	+135%
<b>Average</b>	11.65	0.97	12.62	7.85	+61%

<sup>a</sup> Old MRIP estimates provided to the National Marine Fisheries Service Greater Atlantic Regional Fisheries Office by the Northeast Fisheries Science Center

<sup>b</sup> 2020 recreational estimates were developed using imputation methods (incorporating 2018 and 2019 data) to account for missing 2020 APAIS data.

<sup>c</sup> As noted above, recreational dead discards in weight are typically provided by the NEFSC and are calculated using the same methods as the stock assessments for each species. Due to data availability issues, dead discards for 2020-2021 could not be calculated using the typical methods and instead were generated using alternative methods.

### **Staff Recommendation for 2023 Measures**

The MC is tasked with developing recommendations for recreational bag, size, and season limits for federal waters for 2023. The MC may also consider what adjustments may be needed to state measures; however, state waters measures will be developed separately through the Commission process. As described above, state and federal waters measures should collectively achieve the 10% reduction required under the Percent Change Approach.

As previously stated, in December 2021, the Council and Board proposed a 1-inch size increase in federal and state waters. This change was later implemented in 2022 and prior to this, federal scup recreational measures had remained the same for many years (Table 2). **Staff recommend avoiding further size limit increases in 2023**, as the effectiveness of the 2022 increase has not yet been evaluated. In addition, leaving size limits unchanged would allow more time for anglers to adjust to the recently implemented 1-inch increase coastwide and help avoid additional regulatory confusion. Another increase to the minimum size limit would also increase the minimum size limit to 11 inches in federal waters which is a relatively large compared to when about 50% of scup reach maturity which is estimated to be around 7 inches.<sup>6</sup>

**Reducing harvest through seasonal closures could be considered but may not be ideal in federal waters and many states** since it would require significantly shortening the season or implementing a split season (mid-year closure) to achieve any sort of meaningful reduction in harvest. Currently, the scup recreational fishery is open year-round in federal waters and in most states. Based on 2019-2021 estimates, waves 3-5 comprise approximately 99% of the total recreational scup harvest (Table 5). The proportion of harvest by wave differs across the states, with some states harvesting the majority of their scup in one wave while other states harvest scup more evenly across multiple waves. Because of this, seasonal closures in federal waters could

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<sup>6</sup> 60<sup>th</sup> Northeast Stock Assessment Workshop (2015) assessment report and peer review summaries are available at: <https://www.nefsc.noaa.gov/saw/reports.html>

disproportionately impact some states depending on the percent of each state's harvest from federal waters by wave (Table 5 and Table 6). Reductions to harvest through seasonal closures may be more appropriately applied at the state or regional level.

The majority of anglers do not keep a full bag limit and considerations for a decreased possession limit may be appropriate at this time. Federal waters and the majority of states have a recreational possession limit of 50 or 30 fish. Currently, several states have a "bonus wave" for the party/charter sector with a higher bag limit and states could consider how best to adjust these seasonal limits.

To better inform adjustments needed to achieve a 10% reduction, staff requested additional analysis using the RDM. Similar analysis can also be accomplished using the RFDM; however, due to timing constraints and ongoing work to update the RFDM with 2021 data based on MC feedback, those results are not included in this document. The two set of measures shown in Table 9 were requested and because the RDM cannot analyze federal waters measures separate from state waters measures, the set of measures were treated as if regulations were adopted in both state and federal waters.

The first set of measures (Scup 1) looked at a decrease in the recreational possession limit to 15 fish coastwide (from the current 30 or 50 fish; see Table 3). The results from Scup 1 estimated 2023 harvest would be about 16.28 million pounds. This represents an 5.4% reduction compared to projected 2023 harvest under 2022 measure (17.21 million pounds; Figure 3).

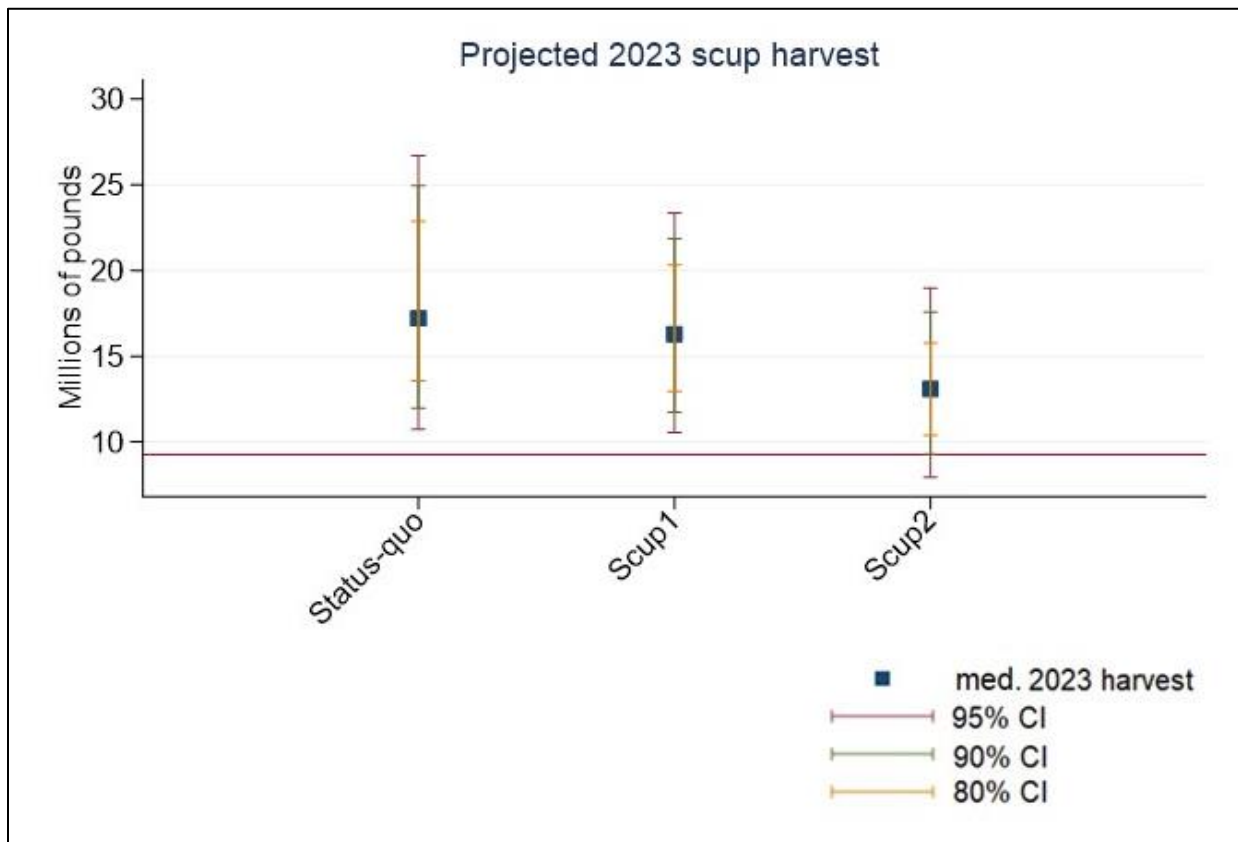
The second set of measures analyzed (Scup 2) looked at a 1-inch increase to the minimum size limit coastwide (from the current 9 or 10 inches depending on the state; see Table 3). Although staff recommend against considering size limit increases for 2023, as described above, this model run was requested to evaluate the magnitude of harvest change and to inform MC discussion of potential options. Scup 2 estimated 2023 harvest would be about 13.22 million pounds which results in about a 24% reduction in harvest compared to projected 2023 harvest under 2022 measures (Figure 3).

Because Scup 1 was below the required 10% reduction, **staff recommend that either a) the MC evaluate a coastwide possession limit of less than 15 fish that would achieve the full 10% reduction, or b) the MC recommend a coastwide 15 fish possession limit with additional adjustments to state waters measures made through the Commission's process to achieve the full 10% reduction.** It is important to note that like the RDM, the RFDM is also not capable of analyzing federal waters measures separate from state waters measures so any additional measures recommended will have to consider changes to both federal and state waters.



**Table 9:** Set of measures evaluated for scup to assess 2023 measures that would achieve a 10% reduction in harvest relative to the estimate of 2023 harvest under 2022 measures.

Set of Measures	Minimum Size (inches)	Possession Limit	Season
Scup 1	Status quo (2022 measures; 9 or 10 inches depending on state; see Table 3)	15 fish	Open year-round
Scup 2	1-inch increase in state and federal waters	Status quo (2022 measures; 30 or 50 fish depending on state and mode; see Table 3)	Open year-round



**Figure 3:** Projected 2023 scup harvest under different set of measures. Status quo represents 2022 scup measures that are currently in place. Scup 1 and Scup 2 represent the set of measures used to evaluate the reduction in projected 2023 scup harvest compared to 2022 scup regulations as described in Table 8. Projected 2023 scup under each scenario is shown using a 95%, 90%, and 80% confidence interval. The red horizontal line on the graph represents the 2023 RHL (9.27 million pounds).