



Mid-Atlantic Fishery Management Council
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MEMORANDUM

Date: November 9, 2022
To: Chris Moore, Executive Director
From: Kiley Dancy, Staff
Subject: Summer Flounder Recreational Management Measures for 2023

Summary

This memo provides information 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 summer flounder recreational measures (i.e., bag, size, and season limits) 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. As described in more detail below, 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.

For summer flounder, the MC is tasked with recommending either the use of coastwide measures (identical measures in all states and federal waters) or conservation equivalency (state- or region-specific measures in state waters, and "non-preferred" federal measures that are waived in favor of the state measures). Under conservation equivalency, the Council and Board must also adopt non-preferred coastwide and precautionary default measures (described in more detail below). Both the non-preferred coastwide measures and the combination of state/regional measures must achieve the same level of expected harvest. The appropriate level of harvest will be 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), as described in more detail below. As described in more detail below, results of the RDM are available to project harvest in 2023 under status quo (2022) measures for summer flounder. While preliminary results of the RFDM are also available, given that model's inability to model slot limits at this time, the RFDM is currently thought to be over-projecting harvest given the slot limit in New Jersey in 2022. Given this constraint, staff recommend using the results of the RDM for development of the 2023 harvest target. The RDM suggests that the 80%, 90%, and 95% confidence intervals around expected harvest in 2023 under status quo measures would be below the 2023 RHL. This, in combination with the current summer flounder stock

status, would result in a **10% liberalization in harvest relative to the projected 2023 harvest under status quo measures**. The projected 2023 harvest under status quo measures is 8.38 million pounds, resulting in a harvest target of 9.21 million pounds under a 10% liberalization.

Staff recommend considering the results of the recent summer flounder management strategy evaluation (MSE)¹ in the development of 2023 recreational management measures, as discussed by the Council and Board in August 2022. As described in more detail below, staff considered several modeled management procedures (or variations on them) for potential use as either regional measures under conservation equivalency or as non-preferred coastwide measures (if applicable) to achieve the 10% liberalization in harvest associated with the percent change approach.

As described below, to achieve the harvest target associated with a 10% liberalization, **staff recommend continuation of regional conservation equivalency, with associated non-preferred coastwide of a 17.5-inch minimum size, 3 fish bag limit, and season of May 1-September 30**. This is a slightly modified version of a set of measures evaluated through the summer flounder MSE. **In addition, staff recommend that the precautionary default measures remain at a 20-inch minimum size, a 2-fish possession limit, and an open season of July 1-August 31**.

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.² 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 measures. Unlike the previous process, the recreational measures 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 summer flounder 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.

¹ Additional information and MSE results are available at <https://www.mafmc.org/actions/summer-flounder-mse> and in the summary document previously provided to the MC at: <https://www.mafmc.org/s/MSE-Briefing-Document-for-MC-Oct-2022.pdf>.

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

Past Management Measures

RHLs for summer flounder were first implemented in 1993. Since then, they have varied from a high of 11.98 million lb in 2005 to a low of 3.77 million lb in 2017. From 1993-2000, coastwide measures were in place for all states and federal waters, with possession limits ranging from 3-10 fish and size limits ranging from 14.0-15.5 inches. Starting in 2001, conservation equivalency was implemented, and has been used as the preferred management system each year since (Table 1). Under conservation equivalency, individual states or multi-state regions set measures that collectively are designed to constrain harvest to the coastwide RHL. Federal regulations are waived and anglers are subject to the summer flounder regulations of the state in which they land. State-by-state conservation equivalency was adopted each year from 2001 through 2013, with each state implementing different sets of management measures. Each year from 2014 through 2022, the Board has approved the use of regional conservation equivalency, where some states form multi-state regions with the same measures. Through 2022, the combination of regional measures has been designed to constrain the coastwide harvest to the RHL.

In December 2021, the Council and Board adopted conservation equivalency for the summer flounder recreational fishery in 2022. They also agreed to allow for up to a 16.5% liberalization of state or regional measures given an increase in the RHL in 2022 as well as a projected harvest underage under 2021 measures. Many states adjusted their measures between 2021 and 2022. Region-specific possession limits in 2022 range from 2-5 fish with size limits ranging from 15-18.5 inches, with various seasons (Table 2).

Under conservation equivalency, the Council and Board must adopt two associated sets of measures: the non-preferred coastwide measures, and the precautionary default measures. The **non-preferred coastwide measures** are a set of measures that would be expected to constrain harvest to the appropriate coastwide target³ if implemented on a coastwide basis (the same measures in all states and in federal waters). The combination of state or regional measures under conservation equivalency is designed to be equivalent to this set of non-preferred coastwide measures in terms of coastwide harvest. These coastwide measures are included in the federal regulations but waived in favor of state- or region-specific measures. **The non-preferred coastwide measures adopted in 2022 include a 4-fish possession limit, an 18.5-inch total length (TL) minimum size, and an open season from May 15-September 15.**

The **precautionary default measures** would be implemented in any state or region that failed to develop adequate measures to constrain or reduce landings as required by the conservation equivalency guidelines. **The precautionary default measures in 2022 include a 2-fish possession limit with a 20-inch TL minimum fish size and an open season from July 1-August 31.**

³ Through 2022, the target level of harvest was the RHL. Starting with 2023, the target level of harvest will be defined by the Percent Change Approach.

Table 2: Summary of federal management measures for the summer flounder recreational fishery, 1996-2023.

Measure	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
ABC (m lb)	-	-	-	-	-	-	-	-	-	-	-	-	-	21.5
Recreational ACL (land+disc; m lb)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RHL (m lb)	7.41	7.41	7.41	7.41	7.41	7.16	9.72	9.28	11.21	11.98	9.29	6.68	6.22	7.16
Harvest - OLD MRIP (m lb)	9.82	11.87	12.48	8.37	16.47	11.64	8.01	11.64	11.02	10.92	10.5	9.34	8.15	6.03
% Over/Under RHL ^c	33%	60%	68%	13%	122%	63%	-18%	25%	-2%	-9%	13%	40%	31%	-16%
Harvest - NEW MRIP	15.02	18.52	22.86	16.7	27.03	18.56	16.29	21.49	21.2	18.55	18.63	13.89	12.34	11.66
Possession Limit	10	8	8	8	8	3	a	a	a	a	a	a	a	a
Size Limit (TL in)	14	14.5	15	15	15.5	15.5	a	a	a	a	a	a	a	a
Open Season	1/1 – 12/31	1/1 – 12/31	1/1 – 12/31	5/29 – 9/11	5/10 - 10/2	4/15 - 10/15	a	a	a	a	a	a	a	a
Measure	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
ABC (m lb)	25.5	33.95	25.58	22.34	21.94	22.57	16.26	11.3	13.23	25.03	25.03	27.11	33.12	33.12
Recreational ACL (land+disc; m lb)	-	-	11.58	10.23	9.07	9.44	6.83	4.72	5.53	11.51	11.51	12.48	14.64	14.90
RHL (m lb) - landings only	8.59	11.58	8.49	7.63	7.01	7.38	5.42	3.77	4.42	7.69	7.69	8.32	10.36	10.62
Harvest - OLD MRIP (m lb)	5.11	5.96	6.49	7.36	7.39	4.72	6.18	3.19	3.35	-	-	-	-	-
% Over/Under RHL ^c	-41%	-49%	-24%	-4%	5%	-36%	14%	-15%	-24%	1%	31%	-18%	-	-
Harvest - NEW MRIP	11.34	13.48	16.13	19.41	16.24	11.83	13.24	10.06	7.60	7.80	10.06	6.82	-	-
Possession Limit	a	a	a	a	b	b	b	b	b	b	b	b	b	-
Size Limit (TL in)	a	a	a	a	b	b	b	b	b	b	b	b	b	-
Open Season	a	a	a	a	b	b	b	b	b	b	b	b	b	-

^a State-specific conservation equivalency measures.

^b Region-specific conservation equivalency measures.

^c Based on a comparison with old MRIP data through 2018 and new MRIP data starting in 2019.

Table 3: Summer flounder recreational fishing measures 2021-2022, by state, under regional conservation equivalency. Conservation equivalency regions in these years include: 1) Massachusetts, 2) Rhode Island, 3) Connecticut and New York, 4) New Jersey, 5) Delaware, Maryland, The Potomac River Fisheries Commission, and Virginia, and 6) North Carolina.

State	2021			2022		
	Minimum Size (inches)	Possession Limit	Open Season	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	17	5 fish	May 23-October 9	16.5	5 fish	May 21-September 29
Rhode Island (Private, For-Hire, and all other shore-based fishing sites)	19	6 fish	May 3-December 31	18	4 fish	May 3-December 31
RI 7 designated shore sites	19	4 fish ^a		18	2 fish ^b	
	17	2 fish ^a		17	2 fish ^b	
Connecticut	19	4 fish	May 4- September 30	18.5	4 fish	May 1-October 9
CT Shore Program (45 designated shore sites)	17			17		
New York	19			18.5		
New Jersey	18	3 fish	May 22-September 19	Slot limit 17-18	2 fish ^c	May 2-September 27
				18	1 fish ^c	
NJ Shore program site (ISBSP)	16	2 fish		16	2 fish	
New Jersey/Delaware Bay COLREGS	17	3 fish		17	3 fish	
Delaware	16.5	4 fish	January 1- December 31	16	4 fish	January 1- December 31
Maryland						
PRFC						
Virginia						
North Carolina ^d	15	4 fish	September 1-14	15	1 fish	September 1-30

^a Rhode Island's 2021 shore program included a combined possession limit of 6 fish, no more than 2 fish at 17-inch minimum size limit.

^b Rhode Island's 2022 shore program includes a combined possession limit of 4 fish; no more than 2 fish at 17 inch minimum size limit.

^c New Jersey's slot limit includes a combined possession limit of 3 fish; two fish greater than 17 inches and less than 18 inches, and one fish greater than 18 inches.

^d North Carolina's regulations have been restricted for all flounders in North Carolina (southern, gulf, and summer flounder) in recent years due to the need to end overfishing on southern flounder. North Carolina manages all flounder in the recreational fishery under the same regulations.

Recreational Catch and Landings 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. The National Marine Fisheries Service (NMFS) used imputation methods to fill gaps in 2020 data with data collected in 2018 and 2019. For example, the 2020 summer flounder harvest estimate for Maine through Virginia combined was developed using approximately 19% 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, 2020-2021 estimates of dead discards in weight were generated by GARFO 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 2021.⁴

Table 3 provides the annual MRIP time series of recreational harvest (in number 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 2008, the high of harvest is 19.41 million pounds or 6.60 million fish in 2013, and the low of harvest was in 2021 with 6.82 million pounds or 2.32 million fish harvested. Catch in numbers of fish (harvest plus live and dead releases) over the same time period has ranged from 23 million fish in 2021 to 59 million fish in 2010 (Table 3). Table 3 also shows the percent of summer flounder released⁵ (relative to total catch in numbers of fish) and the mean weight of landed summer flounder each year from 2008-2021, and 2022 through wave 4.

⁴ Specifically, the 2019 average weight of discarded fish was calculated using recent assessment update information. This average weight (1.07 lb) was applied to the proportion of MRIP live discards in number of fish (MRIP “B2s”) that are assumed to die after being discarded (10% for summer flounder).

⁵ Reported as released alive, with 10% of those live releases assumed to die post-release.

Table 4: Summer flounder recreational catch, landings, and dead discards under revised MRIP estimates, Maine through North Carolina, 2008-2021, all waves. 2022 preliminary estimates are shown through wave 4.

Year	Catch (mil fish)	Harvest (mil fish)	Harvest (mil lb)	Dead discards (mil lb) ^b	% Released (Released Alive) ^a	Average Weight of Harvested Fish
2008	39.48	3.78	12.34	4.34	90%	3.26
2009	50.62	3.65	11.66	5.48	93%	3.20
2010	58.89	3.51	11.34	5.97	94%	3.23
2011	56.04	4.33	13.48	5.98	92%	3.12
2012	44.71	5.74	16.13	4.79	87%	2.81
2013	44.96	6.60	19.41	4.67	85%	2.94
2014	44.58	5.37	16.24	4.61	88%	3.02
2015	34.14	4.03	11.83	3.47	88%	2.92
2016	31.24	4.30	13.24	3.27	86%	3.08
2017	28.07	3.17	10.06	3.30	89%	3.18
2018	23.55	2.41	7.60	2.21	90%	3.15
2019	30.74	2.38	7.80	3.04	92%	3.28
2020	33.25	3.49	10.06	3.19	90%	2.88
2021	22.73	2.32	6.82	2.19	90%	2.94
2022 (w1-4 only)	22.75	2.59	6.73	--	89%	2.60

^a For summer flounder, 10% of recreational releases are assumed to die.

^b As noted above, dead discards for 2020 and 2021 were calculated using the average weight of discarded fish from 2019 due to data availability issues.

Landings by state in recent years in thousands of pounds are shown in Table 4 including full year estimates for 2017-2021 and wave 1-4 estimates for 2022.

The percent of summer flounder harvest (in numbers of fish) from state waters (0-3 miles from shore) averaged 72% from 2017-2021 (Figure 1). Over the same time period, most harvest originated from private/rental mode trips (85%), while party/charter mode and shore mode accounted for an average of 4% and 11% of the harvest, respectively (Figure 2).

Table 5: Summer flounder recreational harvest MRIP estimates (in pounds), by state for all waves (January-December), 2017-2022. 2022 values are preliminary estimates through wave 4 (January-August).

	2017	2018	2019	2020	2021	2022 (w1-4)
MA	171,923	142,540	145,204	175,590	120,805	112,728
RI	596,905	603,752	837,108	479,590	163,104	249,073
CT	402,528	549,268	292,453	387,741	465,968	352,127
NY	4,214,222	2,385,311	2,441,732	2,389,691	1,156,832	2,224,184
NJ	3,601,688	3,154,541	3,229,057	5,491,681	3,780,046	2,661,589
DE	253,703	205,380	224,527	534,247	272,108	211,776
MD	171,498	121,760	206,373	187,228	192,796	151,920
VA	528,350	345,064	368,955	381,165	636,395	768,600
NC	147,426	92,032	52,873	37,936	27,492	0
Coast	10,088,243	7,599,648	7,798,282	10,064,869	6,815,546	6,731,997

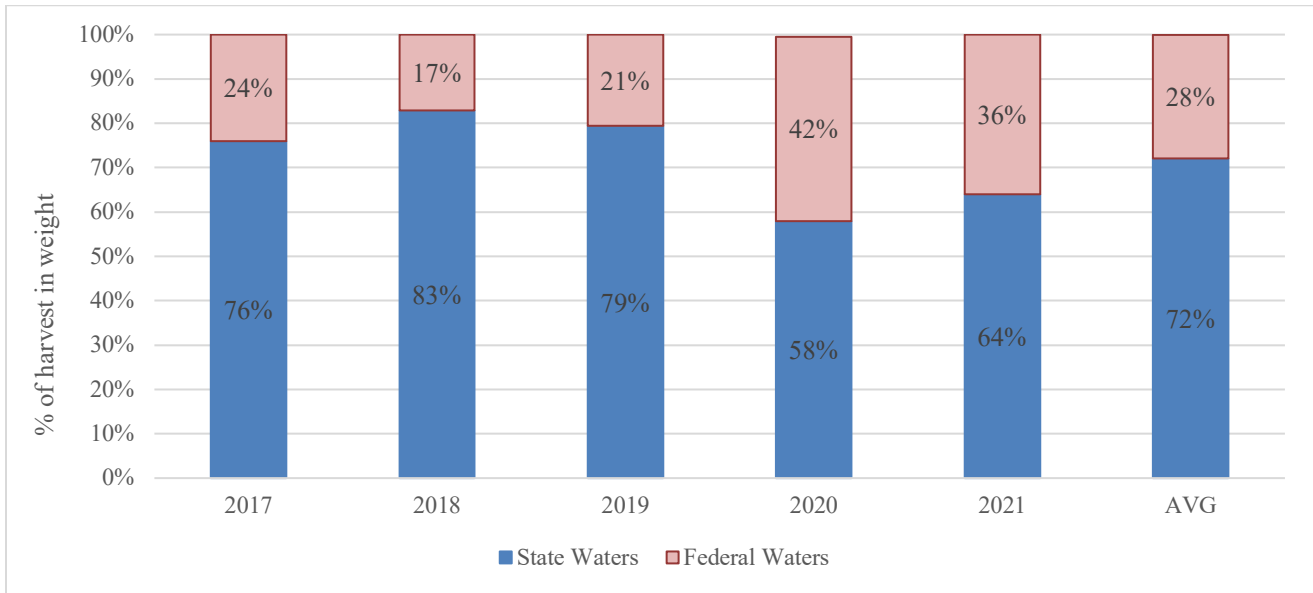


Figure 1: State vs. federal waters harvest (in weight) for summer flounder, 2017-2021. Fishing area information is self-reported by anglers.

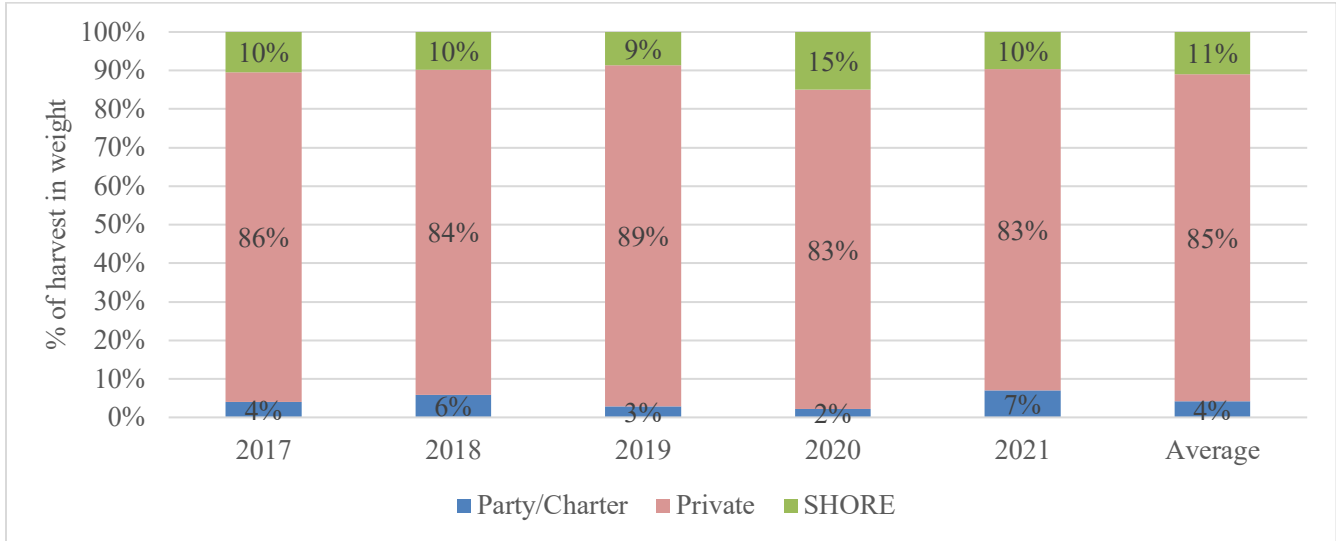


Figure 2: Summer flounder harvest by fishing mode (in weight), 2017-2021.

Percent Change in Harvest Needed for 2023

Comparison of 2023 RHL to Expected 2023 Harvest Under Current Measures

As previously stated, for 2023, summer flounder recreational measures will be set for a single year using the Percent Change Approach. The first step in using the Percent Change Approach for 2023 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., 10.62 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 year⁶ and assuming that harvest in the following year would remain at similar levels if measures remained unchanged. This year, alternative methods of estimating harvest are available to improve projections of harvest in future years under a specified set of management measures. 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. This model was also used through the Summer Flounder MSE. This model accounts for the impacts of regulations, year class strength and 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. This model can also account for the interaction of fishing regulations across species between summer flounder, scup, and black sea bass, meaning that it can incorporate information about how regulations for other species may impact harvest and discards of summer flounder. 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, a lagged recruitment variable, spawning stock biomass, and the RHL. The model is limited to analyzing the impacts of management strategies that have been used in the past. Novel strategies (e.g., slot limits which were used for the first time for summer flounder in New Jersey in 2022) cannot be directly analyzed through this model until MRIP data are available for years when those strategies were used. 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 found in this overview document: 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 peer reviewed by the Council's Scientific and Statistical Committee in September 2021⁷ and have been improved since that time based on their recommendations.

⁶ 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).

⁷ The final report from the SSC review is available at https://www.mafmc.org/s/05_Rec-Model-Peer-Review-Reports.pdf.

At the time of this memo, model results for expected 2023 harvest under status quo measures are available through the RDM. For the RFDM, while preliminary results are available, this model is not able to analyze slot limit measures at this time. As such, the model is currently thought to be over-projecting harvest for summer flounder and producing unrealistic estimates for 2023. The RFDM modelers are considering different methods of accounting for this to adjust the projections. Additional refinements to the RFDM are also in progress to incorporate 2021 data as suggested by the MC. Results may be available by the time of the November 15 MC meeting. During the meeting, the MC should discuss whether this model should be considered for development of 2023 measures given the inability to model slot limit regulations.

Model results from the RDM suggest that under status quo measures, projected harvest in 2023 would be 8.38 million pounds. Under 95, 90% and 80% CIs, the 2023 RHL is **greater than** the upper bound of the harvest estimate CI (i.e., harvest expected to be lower than the RHL; Table 6).

Council staff recommend use of the 80% CI and caution against use of the higher percentage CIs shown in Table 6. 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 6 would be used under the Percent Change Approach (Table 1), all three of the CIs calculated for the RDM would result in the same outcome for summer flounder in 2023 (i.e., a 10% liberalization).

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 6: RDM model results for estimated 2023 harvest under 2022 measures for summer flounder, including the mean, standard deviation, and 95%, 90%, and 80% confidence intervals of 35 simulations in the model. All values are in millions of pounds.

Median	95% CI	90% CI	80% CI	2023 RHL
8.38	6.72-10.47	7.04-10.03	7.56-9.52	10.62

Summer Flounder Stock Status

As shown in Table 1, the second step under the Percent Change Approach is to consider the most recent estimate of spawning stock biomass compared to the target level. According to the 2021 management track stock assessment (using data through 2019),⁸ summer flounder is below the target stock size (estimated at 86% of the spawning stock biomass target). This puts summer flounder in the “**low**” **stock size category for the Percent Change Approach** (Table 1, Column 2).

Resulting Percent Change and Harvest Target

Applying the expected 2023 harvest under status quo measures and the most recent stock status for summer flounder results in a **10% liberalization** in harvest for summer flounder for 2023 (Table 1, Column 3). This change in harvest is relative to the projected harvest under status quo measures. Assuming the projected 2023 harvest under status quo measures referenced above (8.38 million pounds), the **resulting harvest target for summer flounder in 2023 would be 9.21 million pounds.**

Accountability Measures

Federal regulations include reactive accountability measures (AMs) for when the recreational summer flounder annual catch limit (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 against 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.
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

⁸ Available at: https://www.mafinc.org/s/c_2021_summer_flounder_MTA_report.pdf.

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 management 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.

Average recreational catch was below the average recreational ACLs for summer flounder from 2019-2021, meaning that an AM has not been triggered for summer flounder (Table 6).

Table 7: Evaluation of summer flounder recreational AMs using the 2019-2021 average recreational ACL compared to the 2019-2021 average recreational dead catch.

	Recreational Harvest (mil lb)	Recreational Dead Discards (mil lb)	Total Dead Recreational Catch (mil lb)	Recreational ACL (mil lb)	% Over/ Under ACL
2019	7.80	3.04	10.84	11.51	-6%
2020^b	10.06 ^a	3.19 ^b	13.25	11.51	+15%
2021	6.82	2.19 ^b	9.01	12.48	-28%
Average	8.23	2.81	11.03	11.83	-7%

^a 2020 recreational estimates were developed using imputation methods (incorporating 2018 and 2019 data) to account for missing 2020 APAIS data.

^b 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.

Summer Flounder MSE Results

The Council recently completed a recreational summer flounder MSE to 1) Evaluate the biological and economic benefits of minimizing discards and converting discards into landings in the recreational summer flounder fishery; and 2) Identify management procedures to effectively realize these benefits.

Results of the MSE were presented to the Council and Board in August 2022, and were discussed at the October 26, 2022 MC meeting. The management procedures considered via the MSE are listed for quick reference in Table 8 below; for additional information and a summary of the MSE results, see the document previously provided to the MC at: <https://www.mafmc.org/s/MSE-Briefing-Document-for-MC-Oct-2022.pdf>.

As discussed at these previous meetings, **results from the MSE suggest multiple management procedures outperform recent “status quo” management (specified as 2019 management measures in the MSE) at reducing discards and converting those discards into harvest while limiting risk to the summer flounder stock.** In August, the Council and Board agreed that the outcomes from the MSE

should be used to help inform potential recreational management options for summer flounder in 2023. In addition, they supported the use of the modeling approaches developed as part of the MSE (e.g., the RDM) to estimate recreational catch and harvest of summer flounder.

As discussed below, the MSE results were used to inform staff recommended non-preferred coastwide measures under conservation equivalency, as well as a staff recommendation to further exploring MSE management procedures for potential application under regional conservation equivalency measures.

Table 8: Summary of the seven different management procedures tested as part of the EAFM recreational summer flounder MSE. Each MP is labeled with the shorthand used in the display of model results. See the [October 26 MC meeting materials](#) for more information.

Management Procedure #	Procedure Explanation
1 (status quo)	Status Quo: 2019 regulations
2 (minsize-1)	Status quo regions, modified size: 2019 regulations but a 1 inch decrease in minimum size within each state to a minimum of 16 inches
3 (season)	Status quo regions, modified season: 2019 regulations but season of April 1 - Oct 31 for all states
4 (region)	Modified regions: MA-NY - 5 fish, 18 inch min, May 1 - Sept 31 NJ - 3 fish, 17 inch minimum, May 1 - Sept 31 DE-NC - 3 fish, 16 inch minimum, May 1 - Sept 31
6 (c3@17)	Coastwide measures: 3 fish possession limit, 17 inch minimum size, May 1 - Sept 30
7 (c1@16-19)	Modified slot: 1 fish from 16 inches - 19 inches, 2 fish 19 inches and greater, May 1 - Sept 30
8 (slot)	True slot limit: 3 fish possession limit between 16 inches and 20 inches, May 1 - Sept 30

^a The numbering goes from 4 to 6 due to the removal of management procedure #5 from consideration. MP #5 included a 1 fish possession limit, 14 inch minimum size, and May 15-September 15 season.

2023 Staff Recommendation

The development of the MSE and past recreational measures processes have made clear that while there is some stakeholder interest in coastwide measures, it has been difficult to identify coastwide measures that don't disproportionately impact certain states or regions. The MSE process explored potential coastwide or more simplified regional measures that may be beneficial to further explore for future years; however, additional work is needed to evaluate how impacts vary by state.

Staff recommend continued application of regional conservation equivalency in 2023 to achieve the target level of harvest under the 10% liberalization for 2023 (9.21 mil lb). Additionally, **staff recommend applying some of the measures evaluated through the MSE (or modified versions of them) to the development of regional conservation equivalency measures as well as the non-preferred coastwide measures, as described below.**

Non-Preferred Coastwide and Precautionary Default Measures

Under conservation equivalency, a set of **non-preferred coastwide measures** must be identified. The non-preferred coastwide measures must consist of a minimum fish size, possession limit, and season for

2023 that if implemented on a coastwide basis, would be expected to achieve the same level of harvest as the conservation equivalency measures (i.e., would aim to achieve the 9.21 million pound harvest target). Under conservation equivalency, these measures are written into the federal regulations, but waived in favor of the state- or region-specific measures.

For 2022, the non-preferred coastwide measures include an 18.5-inch minimum fish size, 4 fish bag limit, and open season from May 15-September 15. Since conservation equivalency has been implemented at the state or regional level for many years, it has grown more difficult to predict the impacts of coastwide measures. This year, availability of recreational models improves the ability to analyze these measures. **The RDM suggests that the current non-preferred coastwide measures would be too restrictive** relative to the expected 2023 target level of harvest. With 35 simulation runs, the mean harvest projected under these measures was 5.26 million pounds, or 57% of the 9.21 million pound harvest target.

To inform adjustment of these measures, staff requested a model run with a set of coastwide measures considered through the MSE process: Management Procedure #6 consisted of a 17-inch minimum size, 3 fish bag limit, and a season from May 1-September 30. This management procedure was developed as part of the MSE to evaluate and address stakeholder input regarding regulatory equity and complexity. Other than the coastwide slot limit management procedures, this was the only “true” coastwide set of measures evaluated in the MSE, and is the set of measures most similar to the current non-preferred coastwide measures. Results of this run (35 simulations) suggest a mean harvest of 10.80 million pounds, which **exceeds the 10% liberalization target** by 17%.

While the RDM is not currently configured to run half-inch minimum size increments, it can provide harvest estimates within each one-inch size bin. The results of the previous run (MSE Management Procedure #6 with a 17-inch minimum size) estimated that approximately 28% of harvest was predicted to be landed in the 17-17.99 inch bin. Assuming that under a 17.5-inch size limit half of this amount of would be landed, this would adjust the total expected harvest from 10.80 million pounds to 9.28 million pounds, which is 101% of the staff recommended 2023 harvest target of 9.21 million pounds. Therefore, **staff recommend that the non-preferred coastwide measures in 2023 consist of a 17.5-inch minimum size, a 3 fish bag limit, and a season of May 1-September 30.**

As previously stated, the MC must also provide recommendations for **precautionary default measures**. The precautionary default measures are intended to be a deterrent against states/regions implementing measures inconsistent with the conservation equivalency guidelines and are not associated with any particular harvest target. In 2022, the precautionary default measures consist of a 20-inch minimum size, a 2-fish possession limit, and an open season of July 1-August 31. The current precautionary default measures would be much more restrictive than any measure an individual state would implement in 2023. As such, **staff recommend no changes to the current precautionary default measures.**

Conservation Equivalency Measures

The results of the MSE could inform development of regional measures under conservation equivalency, both in terms of considering what the MSE results suggest about how to improve recent management strategies, as well as by potentially informing specific combinations of management measures. The management procedures analyzed through the MSE were not meant to be specific proposals for use in 2023 or any specific future year, but were designed as examples intended to represent a realistic range and scope of regulations that may be of interest to managers and stakeholders. These management procedures were informed by extensive discussion with the MSE core stakeholder group. Modifications to management procedures of interest could be made to achieve the intended percent change for 2023 or a future year. Specifically, **staff recommend that under conservation equivalency (if adopted by the Council and Board), the Technical Committee explore measures similar to either of the following sets of measures, with adjustments as necessary to achieve the 10% liberalization under the Percent Change Approach:**

- **Management Procedure #2:** 2019 regulations but a 1-inch decrease in minimum size within each state to a minimum of 16 inches (except for NC), resulting in the regulations below for each state. Under this management procedure, special shore programs and separate Delaware Bay regulations could not be explicitly analyzed via the model, but the MC could discuss recommending that they remain in place given the expected small percentage of the overall harvest.

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	16	5 fish	May 23-October 9
Rhode Island	18	6 fish	May 3-December 31
Connecticut	18	4 fish	May 4- September 30
New York	18		
New Jersey	17	3 fish	May 24- September 21
Delaware	16	4 fish	January 1- December 31
Maryland			
Virginia			
North Carolina	15	4 fish	January 1-September 3

- **Management Procedure #7 - Modified Slot:** 1 fish from 16-19 inches, 2 fish 19 inches and greater, May 1 - Sept 30 in all states.

As described above and as discussed at the October 26 MC meeting, all management procedures (see Table 8) except for one (MP#3), outperformed the status quo alternative across most performance metrics, including those that reduce recreational discards and provide for increased harvest opportunities. During the October 26 meeting, the MC recommended against further consideration of MP#3 given that it did not perform notably better than the status quo under most metrics, and against MP#8 due to the inability for anglers to retain larger trophy fish as well as the slightly increased risk of overfishing. MP#4 did not seem to generate quite as much interest or discussion from the MSE core stakeholder group, the Council and Board, or the MC. The results of MP#6 are considered above in the staff recommendation for non-preferred coastwide measures.

The results of the MSE indicate that MP#2 and MP#7 both nearly double the average number of harvested fish per trip, the percent of trips that kept a fish, and double the harvest:discard ratio over the 26-year time

frame of the simulation. The average number of discards per trip was reduced by 16% (for MP#2) and 11% (for MP#7). Both procedures resulted in angler satisfaction approximately three times higher than the status quo (Table 9). Both options would lower the minimum size in most states and allow for greater access from the shore mode fishery. Additional information on the MSE results is available at <https://www.mafmc.org/actions/summer-flounder-mse>.

Table 9: Summary of model outputs for select performance metrics for MP#1 (status quo), MP#2, and MP#7 under the baseline operating model configuration.

Performance Metric	MP#1	MP#2	MP#7
Percent of trips that harvest one fish	0.193	0.284	0.35
Average number of harvested fish per trip	0.274	0.471	0.458
Harvest:Discards	0.102	0.207	0.189
Average number of discards per trip	2.91	2.45	2.58
Consumer surplus (angler satisfaction) per trip	3.703	12.896	14.352
Total recreational expenses (millions of \$)	470.9	492.3	499.3
Total Spawning Stock Biomass (mature male & female) in metric tons	67,514	60,504	61,088
Percent of female harvest	0.676	0.607	0.602
Total catch (recreational+commercial) in metric tons	15,935	16,468	16,031
Total recreational removals (harvest+dead discards) in metric tons	6,331	8,157	7,685
Total number of recreational trips (millions)	11.22	11.72	11.91
Percent of trips harvesting a trophy fish (>28 inches)	0.017	0.008	0.008

Staff requested initial RDM runs to estimate 2023 harvest under both sets of measures. The resulting estimated mean harvest for 35 simulations, along with associated CIs, is shown in Table 8. The results indicate that these management procedures would be expected to result in harvest above the specified target under the 10% liberalization. As such, **modifications to the measures would be needed to be consistent with the required application of the Percent Change Approach in 2023**. Due to time constraints for running the model, staff were not able to request additional runs with modified versions of these measures for this memo; however, the MC could comment on additional runs that may be informative for development of regional measures should conservation equivalency be adopted as the preferred management approach for 2023.

Table 10: RDM model results for estimated 2023 harvest under two staff requested MSE management procedure runs for summer flounder, including the mean, standard deviation, and 95%, 90%, and 80% confidence intervals of 35 simulations in the model. All values are in millions of pounds.

Management Procedure	Mean	95% CI	90% CI	80% CI	2023 Harvest Target Under 10% Liberalization ^a
MP #2 (Status quo regions, modified size)	10.86	8.72-13.42	9.14-12.67	9.69-11.98	9.21
MP#7 (Modified Slot)	10.31	8.53-12.11	8.86-11.53	9.31-11.53	

^a Staff recommended target resulting from RDM-projected mean 2023 harvest under status quo measures = 8.38 million pounds.

In summary, staff recommend that the summer flounder recreational fishery be managed under regional conservation equivalency in 2023. As previously stated, use of the RDM in the Percent Change Approach indicates a liberalization of 10% in harvest should be made relative to expected 2023 harvest under status quo measures, resulting in a harvest target of 9.21 million pounds. Staff recommend non-preferred coastwide measures informed by MSE Management Procedure #6, including a 17.5-inch TL size limit, a 3-fish possession limit, and an open season from May 1-September 30, 2023, as well as precautionary default measures that include a 20-inch TL minimum size, 2 fish possession limit, and open season from July 1-August 31, 2022. Staff recommend that under conservation equivalency, the Technical Committee and Board consider using the results of the summer flounder MSE to inform development of regional measures, specifically some variation of Management Procedures #2 or #7.