Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

Date: December 1, 2022

To: Chris Moore, Executive Director

From: Hannah Hart, Staff

Subject: Scup Recreational Measures for 2023

On Tuesday, December 13, the Council and Board will consider 2023 recreational management measures for scup. Materials listed below are provided for the Council and Board's discussion of this agenda item. Please note that some materials will be posted at a later date, as noted below.

1) Summary of November 15, 2022 Monitoring Committee meeting

2) Council staff memo on 2023 recreational scup measures dated November 9, 2022

3) Summary of October 26, 2022 Monitoring Committee meeting

4) 2020-2021 Year-End Catch Accounting and Accountability Measures Letter from GARFO dated October 20, 2022 (*behind Tab 5*)

5) Email comments from advisors and others on summer flounder, scup and/or black sea bass recreational measures received by November 30, 2022

The following materials will be posted to the meeting page once they are available:

6) Summary of the November 30, 2022 Advisory Panel meeting

7) Any additional public comments received by the supplemental comment deadline of December 8, 2022

Summer Flounder, Scup, and Black Sea Bass Monitoring Committee (MC)
November 15, 2022 Webinar Meeting Summary

Monitoring Committee Attendees: Tracey Bauer (ASMFC staff) Julia Beaty (MAFMC staff), Peter Clarke (NJ F&W), Kiley Dancy (MAFMC staff), Lorena de la Garza (NC DMF), Steve Doctor (MD DNR), Alexa Galvan (VMRC), Emily Keiley (GARFO), Hannah Hart (MAFMC staff), Mike Schmidtke (SAFMC staff), Rachel Sysak (NY DEC), Mark Terceiro (NEFSC), Corinne Truesdale (RIDEM), Sam Truesdell (MA DMF), Greg Wojcik (CT DEEP), Rich Wong (DE DFW)

Additional Attendees: Chris Batsavage, Alan Bianchi, Bonnie Brady, Lou Carr-Harris, Greg DiDomenico, Michelle Duval, James Fletcher, Tom Fote, Pat Geer, Emerson Hasbrouck, Dewey Hemilright, Meghan Lapp, John Maniscalco, Jason McNamee, Nichola Meserve, Adam Nowalsky, Scott Steinback, Wes Townsend, Mike Waine

General Comments

Model Comparisons

As discussed at the October 2022 MC meeting, two new statistical models are available this year for estimating harvest under specific measures. These models include:

- Recreational Demand Model (**RDM**): This model accounts for the impacts of regulations, projected population abundance and size distribution, and angler preferences on harvest and discards. Year class strength and population size are based on stock assessment projections. Angler preferences are based on a survey of anglers from Maine through Virginia. This model also accounts for the interaction of summer flounder, scup, and black sea bass fishing regulations on angler behavior. Additional information about this model can be found in this overview document: https://www.mafmc.org/s/fluke-RDM-overview-final-report.pdf. Since the October 2022 MC meeting, this model was updated to account for inflation in trip costs and to incorporate more recent length-weight data for black sea bass.

- Recreational Fleet Dynamics Model (**RFDM**): This model uses a shape constrained additive model to predict harvest and discards based on management measures. Covariates in the models to predict harvest include year, state, minimum size, open season, bag limit, a lagged recruitment variable (for summer flounder and black sea bass), spawning stock biomass (for scup), and the RHL (for summer flounder and black sea bass). Mode (i.e., for-hire vs. private/rental and shore modes) is also included as a variable for scup only. Inclusion of some covariates varied across species based on best model fit and the best judgement of the modelers. An R Shiny App[1] is being developed for this model to allow the MC to modify management measures and view the resulting predicted harvest and

---

[1] An R Shiny app is an interactive web-based app that can be easily accessed and used by others, in this case to explore sets of measures on a state or coastwide scale and display outputs of each scenario.

discards. Additional information about this model can found in this overview document: https://www.mafmc.org/s/RFDM_CompleteModel_WriteUps_Oct2022_FinalDraftclean.pdf. Since the October 2022 MC meeting, this model was updated to add 2021 data. The average weight per harvested fish was also updated based on 2021 average weights.

The MC discussed the appropriate model to use for each species for estimating 2023 harvest under 2022 measures (as required under the Percent Change Approach) and for adjusting measures for federal and state waters.

Neither model can evaluate federal waters measures independently from state measures. The MC agreed this is not an issue for summer flounder or black sea bass, where measures are either identical in state and federal waters (coastwide measures) or the federal waters measures are waived (conservation equivalency). After some discussion, the MC agreed this would also not be an issue for scup given that most scup harvest occurs in state waters. The models can be used for setting state waters scup measures with the assumption that overall harvest will be driven primarily by those measures as opposed to the federal waters measures.

While the MC generally prefers consistency, they agreed that there may be reasons to prefer one model over the other for a particular species, including the ability to model certain regulations, the performance of the model, and the information used in each model, as discussed below. However, one MC member noted a general preference for the RDM given that it considers angler behavior and had narrower confidence intervals (CIs) than the RFDM.

The group supported continued evaluation of both models and their performance for each species, particularly with a comparison to MRIP data, as these models get applied in the first few years. Model performance evaluations were presented during the MC meeting; however, the results were presented in different ways for each model, which made it difficult to directly compare the results. In the future, the MC recommended that performance of the two models be presented the same way, including a side-by-side table of results of each model for ease of comparison and increased transparency. The MC agreed it may not be constructive or efficient to run two models every year; however, they preferred not to be restricted to using the same model for each species every year at this early stage in applying them. Evaluating model performance over more than one year of the recreational measures process may be helpful.

The MC discussed the possibility of averaging outputs from the two models. They agreed this would be complicated for determining how to adjust measures, especially at the state level. It would also be more time intensive to run and reconcile multiple model results for many different configurations of measures.

Confidence Intervals

The MC agreed with the staff recommendation to use 80% CIs for all three species for setting 2023 measures. MC members noted that this recommendation is based on a previous analysis of MRIP data by the Recreational Harvest Control Rule Framework/Addenda Fishery Management Action Team/Plan Development Team (FMAT/PDT) and in general, would be expected to include reasonably tight bounds around the estimates. MC members also noted that CIs that are too wide would limit the ability of managers to respond appropriately to changes in the fishery and would increase the likelihood of remaining in the middle rows of the Percent Change Approach table (see Appendix 1) when other rows may be more appropriate.

One MC member asked for clarification on why 80%, 90% and 95% CIs were presented as opposed to other CIs such as 70%. Staff clarified that 80% is based on the prior FMAT/PDT recommendation. The 90% and 95% CIs were also shown for comparison because they are typical CIs used in other contexts. Staff also noted that the MC could recommend other CIs and both the RDM and RFDM can calculate any percentage CIs.

One MC member asked how the CIs calculated by the RDM and RFDM compare to the CIs around the annual MRIP estimates. Staff said this comparison has not yet been done. CIs generated from model outputs are not directly comparable to MRIP percent standard errors (PSEs). Prior to availability of the models, the FMAT/PDT analysis used MRIP PSE values to calculate the CIs, but the models consider other factors in addition to MRIP data. CIs are generated from the range of values produced by the model for each run.

Although the MC supported the use of 80% CIs for all three species for setting 2023 measures, they also recommended further analysis and further discussion in 2023 of the most appropriate CI over the longer-term.

MC Comments on the Percent Change Approach

The MC discussed that the choice of model (or other) estimates of harvest and choice of the CI under the Percent Change Approach should be rooted in technical justification. They agreed that they should not adopt recommendations based on desire for a particular outcome. In the future, a side-by-side view of model performance may help with these conversations. They also acknowledged that there may be situations where they do not believe the resulting bin is appropriate for a given species in that year. However, they must follow the Percent Change Approach bins as they have been laid out by the Council and Board.

One MC member noted that under the Percent Change Approach, CIs are only considered when determining the appropriate percent change in coastwide harvest. CIs are not used when determining which combinations of measures would achieve that percentage change. Instead, measures will be evaluated based on point estimates. This MC member said this feels like a disconnect within the Percent Change Approach and may create challenges when setting measures.

Some MC members expressed some concerns about how the Percent Change Approach relates to recreational Accountability Measures (AMs). For example, as discussed below for scup, in some situations the Percent Change Approach could specify a liberalization despite an AM requiring some degree of reduction also being triggered.

Stability was a primary goal of the Recreational Reform Initiative. Starting with 2024 measures, the Percent Change Approach may provide some increased stability by setting measures for two years at a time. However, the MC expressed **concern that the Percent Change Approach may require frequent changes in measures even in situations when managers would otherwise prefer status quo**. For example, when biomass falls into the "Very High" category there is no option for status quo under this approach; the only options will be to liberalize or reduce harvest.

Scup

One MC member questioned if the Percent Change Approach puts the scup fishery at risk of exceeding the overfishing limit (OFL) given it would allow major RHL overages in 2023. The MC member also questioned if either the RDM or RFDM provides an estimate of fishing mortality (F). Staff responded that hypothetically if the commercial sector were to catch their full Annual Catch

Limit, there is potential for the scup fishery to exceed the OFL in 2023; however, given recent trends in commercial harvest it is not expected that the commercial sector will harvest the full commercial quota and therefore it is less likely that the scup fishery will exceed the OFL in 2023. Staff also confirmed that neither model produces an estimate of F but an updated management track stock assessment in 2023 (and every other year going forward) will provide those details.

The MC did not reach consensus on the recommended model to use for setting 2023 scup measures. After a second vote as described in more detail below, **six MC members supported use of the RFDM, three MC members were in support of using the RDM, and three MC members abstained.**

MC Considerations for using the RFDM

2021 data were added to the RFDM model based on recommendations made during the October 2022 MC meeting. New model estimates that were not previously available to the MC were presented during the meeting (Table 1). When converted to pounds of fish, the new model estimates changed the outcome under the Percent Change Approach. This change resulted in scup falling in the 10% liberalization bin instead of the 10% reduction bin based on previous model results (Table 3, column 3).

The RFDM modelers presented a retrospective analysis that shows that the model does a decent job of predicting harvest, with MRIP harvest point estimates generally falling within the upper and lower quartiles of the model estimates in each year since 2014. The out-of-sample predictions (where a single year's worth of data is removed from the model and then predicted by the model) shows fairly consistent results, except for a notable underprediction in 2016 and 2017. For discards, the retrospective analysis indicates the model does a decent job of estimating discards as well, generally falling within or just outside the upper and lower quartiles of the model estimates each year.

Table 1: Updated RFDM results for scup presented during the November 15 MC meeting compared to RFDM estimates provided in the meeting materials. The model was updated to include 2021 data. All values are in millions of pounds. *Note RFDM provides estimates in number of fish, which were converted to pounds based on the average weight of harvested fish from the most recent year of MRIP data incorporated into the RFDM (i.e., 2019 for the results included in the briefing materials and 2021 for the results presented during the November 15 MC meeting).*

RFDM output	Estimated 2023 harvest under 2022 measures	95% CI	90% CI	80% CI	2023 RHL
Included in 11/15 MC meeting materials	16.84 (median)	8.21 – 31.38	9.38 – 28.10	10.73 – 25.68	9.27
Updated model results presented during MC meeting	14.42 (median)	6.87 – 28.38	7.83 – 25.87	8.95 – 23.08	

MC Considerations for using the RDM

The RDM modeler presented out-of-sample predictions for 2018-2020 and preliminary 2022. For this analysis the model was calibrated to 2021 and the appropriate measures were set for each year. This analysis indicated the model did a better job at predicting recent years, 2020 and preliminary 2022, compared to earlier years, 2018-2019. In recent years, estimates of harvest and total catch

fall within the MRIP PSEs. For 2022 data through wave 4, the model is just slightly underpredicting harvest.

Other Considerations and MC Recommendations for 2023 Measures

Some MC members initially leaned towards taking an average of the two models to inform the process for this year. These MC members initially said they did not have a strong opinion on which model to use since it is not possible to directly compare the model performance results as presented during the meeting. These MC members felt using both models may be appropriate, especially in this first year of using them. However, as described in General Comments above, it would complicate the process of determining what measures should be taken to achieve the percent change in harvest required and which model would then be used to make that determination. Another MC member noted it may be inappropriate to average the two models for scup given they result in opposing percent change results.

Other MC members leaned towards the RDM because it incorporates angler behavior or the RFDM due to the ability of state staff to easily run their own regulation queries by using the R Shiny App. It was also noted that the RFDM could consider mode for scup and the RDM could not. One MC member noted they were uncomfortable with the choice presented to the MC and felt it was inappropriate to choose a model based on the preferred outcome as opposed to model performance. Other MC members voiced general frustration with the Percent Change Approach options for scup in 2023 being limited to a 10% reduction or 10% liberalization, when many members believed status quo to be more appropriate. Initially, the MC took a vote on three options, 1) use of the RDM, 2) use of the RFDM, or 3) averaging the two model results. Initially, the MC identified the RDM as the model to use in 2023. However, this vote was later revisited following additional discussion during black sea bass and summer flounder. The second vote was modified and only polled the group on the use of the RFDM or the RDM. As described above, this vote resulted in six MC members in favor of the RFDM, three in favor of the RDM, and three abstentions.

Given the lack of consensus on model preference and the resulting percent change in harvest required by each model, the MC discussed recommendations under both scenarios. The RFDM would result in a 10% liberalization. Two MC members expressed concern about the wide CIs produced by the RFDM compared to the RDM. They noted that the wide CIs are less meaningful for management and questioned if a 10% liberalization is truly the appropriate result for scup under the Percent Change Approach. They reiterated concerns expressed earlier related to the use of a higher percent CI (i.e., 95% or 90%) and noted having similar concerns for all CIs under the RFDM. Another MC member said they were less worried about the wide CIs produced by the RFDM given uncertainty in the MRIP data, and such wide CIs might be appropriate for scup. The majority, but not all MC **members agreed that because the AMs were triggered this year and due to recent fishery performance, a liberalization would not be appropriate for scup; however, because biomass is currently almost two times the target, it would be appropriate to recommend status quo instead.** All MC members that voted in favor of the RFDM voted for this model option under the stipulation that status quo measures would be recommended for scup. However, one MC member noted that because the AMs state "adjustments to measures will be made," status quo measures may not be justifiable under current regulations.

In contrast, the RDM would result in a 10% reduction. Therefore, if the Council/Board prefer to use the RDM or if GARFO indicates a liberalization or status quo does not satisfy the triggered AMs, the MC discussed their preferred action under the 10% reduction scenario. However, it is

important to note that because the majority of MC members voted in favor of the RFDM, the MC recommendation for 2023 scup measures was status quo. After reviewing the information presented by staff and the additional RDM analysis of different sets of measures, the MC agreed with the staff recommended option for a reduced coastwide possession limit of 15 fish with additional adjustments to state waters measures made through the Commission's process to achieve the full 10% reduction. One MC member expressed dropping the possession limit would negatively impact party/charter boats fishing in federal waters during winter months. For-hire captains in the past argued in favor of high possession limits to attract clients and promote trips to be worth the client's time and money. This MC member said for many of these captains this is their only source of income and that a significant decrease in the possession limit could negatively impact their ability to sell and run trips. One MC member expressed interest in further evaluation of a coastwide possession limit that would achieve the full 10% reduction simply to better understand how much of a reduction would be necessary. Another MC member expressed interest in modifying the open season for scup but agreed with the staff recommendation that it would be more appropriate to implement a seasonal closure on a state by state or regional scale as opposed to a coastwide closure in federal waters.

Public Comments

One AP member asked what the harm would be in waiting to review MRIP wave 5 harvest information. Staff responded that this data will not be available until mid-December and preliminary 2022 data are not currently considered in the models to estimate 2023 harvest. Preliminary wave 1-4 2022 data were shown in presentations for comparison purposes only. Modeling approaches provide an opportunity to rely less on preliminary current year data, although this information could be included in future model runs if desired.

Black Sea Bass

MC Considerations for using the RDM or RFDM

The MC reviewed figures illustrating how well the RDM and RFDM predicted past MRIP estimates at the coastwide level. As previously stated for scup, the analyses were not conducted in an identical manner across the two models. For example, different time periods were analyzed and the results were presented in different formats. This posed challenges for directly comparing the two models. Both models appeared to predict past MRIP estimates reasonably well.

The RDM overpredicted coastwide harvest and catch in 3 of the 4 years shown. The modeler and MC were not able to provide a clear explanation for this overprediction without additional time to consider it in more detail.

The RFDM produced similar estimates of harvest as the MRIP estimates in most, but not all years. The model notably under-predicted harvest in 2016 and 2017. However, the MRIP estimates in those years were previously identified as outliers due to the outsized influence of single state/wave (and in one case, mode) estimates on the coastwide estimate. The model similarly produced reasonable estimates of discards, with no apparent trend of consistently over or under-predicting across the time period shown.

One of the RFDM modelers noted that the disconnect between the model estimates of harvest and the MRIP estimates for 2016 and 2017 is not unexpected as those MRIP estimates are considered outliers. In fact, this could be an example of how models may be more appropriate to use when

setting measures than using MRIP data alone, especially single-year MRIP estimates. The models may provide better predictions of reality because they consider other information beyond just MRIP data and can consider uncertainty in that information.

The modelers presented an R Shiny app during the meeting to show the MC how estimates of harvest in numbers of fish can be quickly generated based on specified bag, size, and season limits. The version of the tool that was shown to the MC analyzed coastwide measures (i.e., the same measures in all states), which is useful for evaluating the non-preferred coastwide measures that are required under conservation equivalency. The modelers plan to develop a modified version of this tool to allow for specification of variable bag, size, and season limits by state. The MC agreed that this tool is very useful and strongly supported the ability to use this tool on their own to develop state waters measures through the Commission's Technical Committee.

Given the ability of the model to produce harvest estimates which reasonably matched the MRIP estimates in most years, and given the ease of use of the model through the R Shiny app, including future use by the Technical Committee when developing state waters measures, **the MC supported use of the RFDM for setting 2023 recreational black sea bass measures**.

After the MC adopted their recommendation to use the RFDM to set 2023 black sea bass measures, they discussed how the model is currently configured in more detail. For example, recruitment is included as a variable in the model for black sea bass, but lagged by three years (e.g., the 2021 value is 2019 recruitment from the latest stock assessment). This allows the model to consider availability of each year class when they are large enough to start being retained in the fishery.

The RFDM also includes the RHL as a covariate in the black sea bass model, with the rationale that it is a proxy for stock status. Some MC members questioned whether this is an appropriate assumption. One of the RFDM modelers explained that alternative versions of the model using SSB as a covariate instead of the RHL did not produce a logical effect. However, the RHL covariate explained a decent amount of variance in the model. This may be because in the past measures were set based on the RHL and there were often time lags between increases in the SSB and resulting increases in the RHL.

One MC member questioned whether the harvest target based on the 10% reduction would be a better variable to input in the model for 2023, rather than the 2023 RHL, as under the Percent Change Approach, measures will not be set based on the 2023 RHL. Given how the model is currently configured, one of the RFDM modelers said the 2023 RHL would be most appropriate.

As previously noted, the RFDM produces outputs in numbers of fish. The group briefly discussed the need to convert those numbers to pounds to determine which measures achieve the 10% reduction in harvest under the Percent Change Approach. It may be possible to update the RFDM to generate outputs in weight in future years; however, this will not be possible in time for setting 2023 recreational measures.

MC Recommendations for 2023 Measures

The RFDM output of 2023 harvest in numbers of fish under 2022 measures was converted to weight based on the average weight of harvested fish in 2021 (the most recent year of data included in the model). This resulted in a median estimate of 11.96 million pounds of harvested fish, with an 80% CI of 8.17 – 16.81 million pounds. The 2023 RHL of 6.57 million pounds is below the lower bound of this CI. Considering that the most recent estimate of biomass is more than 150% of the target level, **the Percent Change Approach requires a 10% reduction in harvest in 2023**.

This reduction is applied to the estimate of 2023 harvest under 2022 measures. As such, the MC's recommendation for use of the RFDM would result in a 2023 harvest target of 10.76 million pounds.

The MC recommended continued use of conservation equivalency to waive federal waters black sea bass measures in favor of state waters measures in 2023. Based on the RFDM model results, **the current non-preferred coastwide measures would result in harvest exceeding this target level**. The MC discussed how to modify these measures to achieve the appropriate coastwide harvest target. They agreed that **further discussion was needed after the meeting to finalize their recommendation for non-preferred coastwide measures**.

The MC noted that the RFDM results suggest that changing the minimum size limit has a larger impact on harvest than changes to the bag limit or open season. The MC has reached similar conclusions in the past based on analyses of MRIP data. One MC member asked if the RDM showed similar results. The RDM modeler confirmed that this same general trend is evident in the RDM.

The RFDM Shiny app was used during the MC meeting to consider how to change the non-preferred coastwide measures. The results suggested that, compared to the current non-preferred coastwide measures, increasing the minimum size by one inch, decreasing the bag limit by two fish, and closing half of wave 3 and all of wave 5 may achieve the 10% reduction in 2023. However, the RFDM modelers said this may be an overly conservative estimate as the model may need adjustments to ensure no harvest is predicted for closed waves. The modelers agreed to make these adjustments to the model and to provide the MC with updated results over email. They agreed this could be done in time to allow the MC to finalize their recommendations for non-preferred coastwide measures prior to the December 13 Council and Board meeting.

The MC supported the staff recommendation for 2023 precautionary default measures of a 16-inch minimum fish size, a 2 fish possession limit, and an open season of June 1 – August 31.

The MC also had no concerns with Virginia's proposal to open their 2023 February fishery using the same process as prior years to monitor February harvest and make adjustments to the season later in the year as needed.

Public Comments

One AP member asked why the MC hasn't considered his past requests to use a total cumulative length limit with no discards. He would like the MC to state on the record that they prefer dead discards over total utilization.

A staff member of the NEFSC noted that there seemed to be a misconception about how the RDM could be used to set state waters measures. He noted that states will be closely involved in future model runs to analyze state waters measures, even if states can't run the RDM on their own. The staff involved in developing the RDM are committed to working with states to analyze multiple options for state waters measures in a timely manner.

One AP member asked if the RFDM shiny app could be used to generate a starting point for measures, which could then be run through the RDM to further examine the results. Staff indicated that this is a possibility.

Summer Flounder

The MC supported the use of the **RDM for setting 2023 summer flounder measures**, due to model performance, ability to model slot limits, and concern over high confidence intervals resulting from the RFDM.

MC Considerations for Using the RDM

The RDM model performs well for summer flounder. Out-of-sample predictions indicate the model does a better job of predicting summer flounder harvest in general compared to the other species. All model estimates of harvest in pounds fall within the MRIP PSEs. For 2022 data through wave 4, the model is spot on. For harvest in numbers, similarly, the estimates are close. Summer flounder total catch is generally less well predicted, with more underprediction, but results are somewhat similar to MRIP confidence bounds. All results fall within bounds except for 2022 up to wave 4. It was also noted that extensive effort was put into developing and refining this model during the development of the summer flounder management strategy evaluation (MSE).

Some MC members were concerned that if using the RDM, a lot of time and back and forth with modelers would be needed, as the model is currently not set up to be run by others and requires several hours to run. In some states, there is extensive back and forth between state staff, advisors, Board members, Marine Advisory Councils, etc. This occurs throughout the process of developing potential regulations for Board approval, and during the process of selecting a final set of regulations. However, Lou Carr-Harris noted that he is available to do this work, as it is in his contract to work with state managers and the Council/Board throughout the recreational measures process. The MC agreed that one way to make the process of running state measures more efficient would be to share the input spreadsheet for the RDM so that the states can pull together inputs themselves for running through the model. This can be coordinated among the Technical Committee to make things as manageable as possible. It is also possible that MC members can use the **RFDM** (which they will be able to run on their own via the Shiny app) to test different sets of measures to generate ideas for possible adjustments. This could help narrow down the requests for model runs through the **RDM**.

MC Considerations for Using the RFDM

The RFDM is not currently able to explicitly model slot limits, as it works off past data. Because slot limits have not been applied prior to 2022, they cannot be modeled directly. The MC discussed that in the future, once MRIP data on harvest under slot limits are available, the model will be able to handle slot limits. In initial runs of the RFDM, the modelers used a straight 17-inch minimum size for New Jersey which appeared to notably over-predict harvest. Prior to the MC meeting, the modelers tried two different methods of adjusting projected harvest in New Jersey in an attempt to account for the slot limits. However, due to the methods used for these adjustments,[2] confidence intervals could not be calculated for them.

---

[2] The two methods used to adjust New Jersey's harvest included: 1) Taking total landings at length over 18 inches in 2022 (year with the slot) divided by landings at length over 18 inches in 2021 (no slot). This gives the proportion of landings in that size range that 2022 represents relative to 2021, which is used to calculate the proportional decrease which is applied to the model estimate for NJ. 2) The proportion of harvest at length over 18 inches in 2022 is subtracted from the proportion of harvest over 18 inches in 2021. This is used to calculate the proportional decrease which is applied to the model estimate for NJ. The results of the RFDM runs using these methods resulted in median 2023 harvest estimates of 10.45 or 10.18 million pounds, respectively.

For model performance, the straight retrospective analysis shows that the model does a decent job of predicting harvest, with MRIP harvest point estimates generally falling within the upper and lower quartiles of the model estimates in each year since 2013. However, in some years the model is biased low. An estimate for 2022 generated using partial year data fairly closely matches the MRIP estimates. However, estimates for 2023 jump way up, as the result of New Jersey's regulations being modeled as a 17-inch minimum size as opposed to a slot limit. The out-of-sample predictions (where a single year's worth of data is removed from the model and then that year is predicted by the model) show fairly good results, except for a more notable underprediction of 2017 and overpredictions in 2019 and 2021. For discards, the retrospective analysis indicates that the model does not do a good job of estimating discards in the early years, but does better later on. Similarly, out-of-sample predictions suggested the model better predicted discards in recent years than earlier in the time series.

Several MC members initially leaned toward the RFDM due to the ability of state staff to easily run their own queries on regulations using the Shiny app.[3] As noted above, MC members should still be able to run RFDM queries to inform their selection of model request runs through the RDM.

Several MC members expressed concern that the confidence intervals for summer flounder under the RFDM are very wide (approximately 10-15 million pounds depending on the percentage). All of these encompass the RHL and would result in a 10% reduction, but MC noted that because these intervals were so wide, they are less meaningful for management and it is less clear that a reduction is the appropriate course of action. A few MC members also noted that the RDM for summer flounder seems to perform somewhat better in terms of estimation. In addition, because it is not possible to get a confidence interval from the adjusted 2023 estimates (adjusted for the NJ slot limit), it does not appear that it can be used to determine the appropriate harvest bin under the Percent Change Approach.

MC Recommendations for 2023 Measures

For these reasons, the **MC ultimately supported the use of the RDM for estimating summer flounder** 2023 harvest under status quo measures, as well as for adjusting the measures. The MC also supported the use of an 80% confidence interval, consistent with that applied for scup and black sea bass, for reasons described for those species above. Using the 80% confidence interval around the RDM median harvest estimate of 8.38 million pounds for 2023 under status quo measures, the 2023 RHL (10.62 million pounds) falls above the upper bound of the confidence interval. In combination with summer flounder stock status, this would result in a 10% liberalization under the Percent Change Approach, relative to the 8.38 million pounds. The MC confirmed that the 2023 coastwide harvest target would thus be 9.21 million pounds.

The MC agreed with the staff recommendation for **continued use of regional conservation equivalency for summer flounder to achieve the harvest target in 2023**, using the same regions as adopted in 2022 and as defined in Addendum XXXII.

Under conservation equivalency, the MC also agreed with the staff recommended **non-preferred coastwide measures including a 17.5-inch minimum size, 3 fish bag limit, and open season**

---

[3] It was noted that while the Shiny app is currently not configured to run regions (combinations of states), it could do so with some changes in coding, or states could combine state results into regional results.

May 1-September 30. As discussed in the staff memo, this is a slightly modified version of a set of measures evaluated in the summer flounder MSE (Management Procedure #6).

The MC recommended status quo **precautionary default measures including a 20-inch minimum size, a 2 fish possession limit, and an open season of July 1-August 31.** The group agreed that these measures were sufficiently restrictive to deter states from adopting measures outside of the agreed upon conservation equivalency guidelines for 2023.

The MC considered the staff recommendation to evaluate two other MSE options for potential application to state waters measures under conservation equivalency. The MC did not recommend pursuing these options at a coastwide level, because some of these measures would not be desirable in certain states and may not allow all states to liberalize equally or at all. The MC instead supported allowing each region the flexibility to modify their regulations as they see fit (within Board guidelines) to achieve a regional harvest target. These harvest targets would be developed based on a 10% liberalization from the RDM results for each state/region. Individual regions could consider measures similar to the MSE measures discussed, if desired.

Public Comments

An Advisory Panel (AP) member sought clarification on the purpose of the harvest target and asked whether the target was derived from the RHL under the revised allocations. Staff responded that while the 2023 RHL, which was based on the revised allocations, is factored into the determination of the appropriate percent change bin, it is not directly used to derive the harvest target.

Another AP member asked why the MC is not using the best available science in applying the concepts of Big Old Fat Fecund Female Fish. He questioned why managers continue to recommend targeting fish over 17 inches knowing they are mostly breeding females. Staff responded that the implications of various size limit approaches was thoroughly explored in the summer flounder MSE, including the impacts to female stock biomass. Different types of size limits that reduce fishing pressure on larger fish, such as slot limits, have been and are currently being considered by managers.

A Board member requested clarification on how measures would be adjusted under MSE Management Procedure #2, which staff recommended the Board consider applying under conservation equivalency. He noted that the measures for New Jersey under this approach look better than New Jersey's current measures. Staff responded that model runs indicate that this set of measures as modeled in the MSE would need to be restricted somewhat in order to not exceed the recommended harvest target. Model runs with tweaks to these measures were not able to be completed prior to the meeting.

Appendix: Percent Change Approach Recommendation Summary

Table 2: Summary of model results and MC recommendations for Percent Change Approach for each species in 2023. Values are in millions of pounds.

Species	Model	Estimated 2023 Harvest Under 2022 Measures	80% CI	2023 RHL	Stock Size Category	Percent Change Approach Requirement	MC Recommendation	Resulting 2023 Harvest Target
Summer Flounder	**RDM** *Recommended by MC for 2023*	**8.38**	**7.56-9.52**	10.62	Low	**10% liberalization**	**10% liberalization**	**9.21**
Summer Flounder	**RFDM** *Not recommended by MC for 2023*	12.77[a,b]	8.55-18.79[b]			10% reduction	N/A	11.49
Scup	**RFDM** *Recommended by MC for 2023*	**14.42[b]**	**8.95-23.08[b]**	9.27	Very High	**10% liberalization**	**Status quo** *due to AMs*	**14.42**
Scup	**RDM** *Not recommended by MC for 2023*	17.21	13.56-22.68			10% reduction	N/A	15.49
Black Sea Bass	**RFDM** *Recommended by MC for 2023*	**11.96 [b]**	**8.17-16.81[b]**	6.57	Very High	**10% reduction**	**10% reduction**	**10.76**
Black Sea Bass	**RDM** *Not recommended by MC for 2023*	11.05	10.00 -11.96			10% reduction	N/A	9.95

[a] As described above, the RFDM modelers used two methods to adjust this estimate to account for New Jersey's slot limit. The adjusted values were 10.45 and 10.18 million pounds depending on the method used. There are no confidence intervals associated with these adjusted estimates.

[b] RFDM model results are reported in number of fish and were converted to pounds based on average weight of harvest in 2021 from MRIP.

Table 3: Process for determining appropriate percent change in expected harvest when developing measures under the Percent Change Approach, with Nov. 2022 MC recommendations for each species highlighted in orange (summer flounder), purple (scup), and blue (black sea bass). As described above, a recreational AM has also been triggered for scup indicating that adjustments to measures are needed. **As such, the MC recommended that it is not appropriate to take a liberalization for scup and that measures should remain status quo.**

Column 1 **Future RHL vs Estimated Harvest**	*Column 2* **Biomass compared to target level (SSB/SSB$_{MSY}$)**	*Column 3* **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%

Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

M E M O R A N D U M

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.[1] 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.

---

[1] 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.

Column 1 **Future RHL vs Estimated Harvest**	Column 2 **Biomass compared to target level** (SSB/SSB$_{MSY}$)	Column 3 **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

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[a]	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[b]	-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[c]	29.67	10.39	9.27	N/A	-	-	TBD	TBD	TBD

[a] Based on a comparison with old MRIP estimates through 2019 and new MRIP estimates starting in 2020
[b] Old MRIP estimates provided to the National Marine Fisheries Service Greater Atlantic Regional Fisheries Office by the Northeast Fisheries Science Center
[c] 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 designed 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.[2]

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.

---

[2] 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.

Year	Catch (mil of fish)	Harvest (mil of fish)	Harvest (mil lbs.)	Dead discards (mil lbs.)	% Released (released alive)	Avg. weight of landed fish (mil lbs.)
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%
Total	**0%**	**4%**	**29%**	**39%**	**28%**	**1%**

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
Total	**13,526,579**	**12,977,417**	**14,116,226**	**12,913,808**	**16,621,640**	**13,717,857**
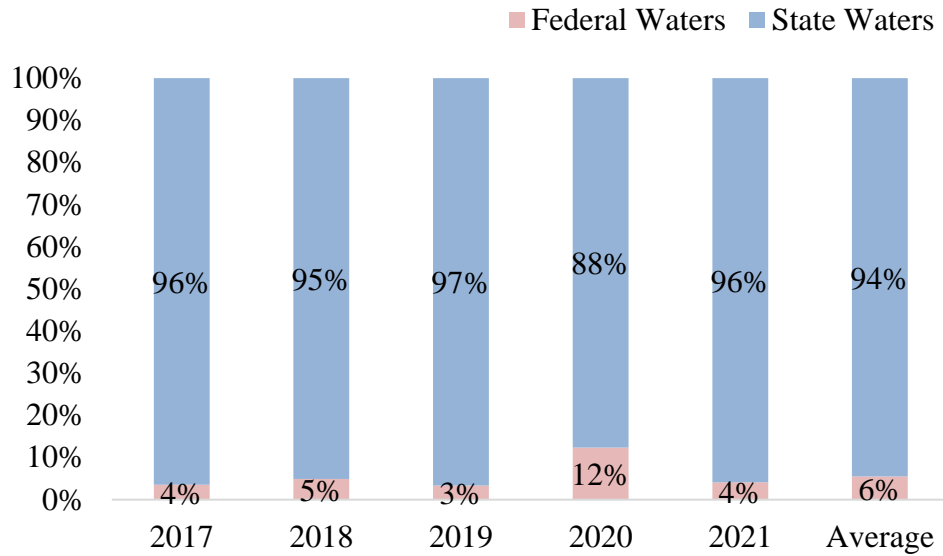
Figure 1: Proportion of 2017 – 2021 recreational harvest (in pounds) in state and federal waters, ME-NC. *Note: area information is self-reported based on the area where the majority of fishing activity occurred on each trip.*
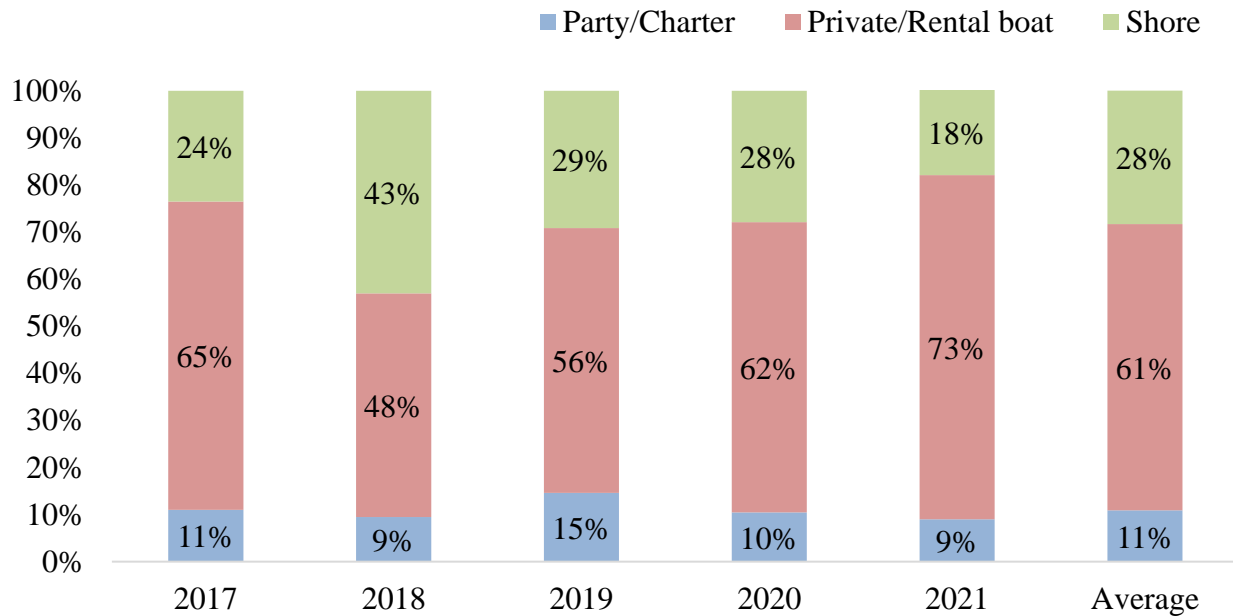

Figure 2: Proportion of 2017 – 2021 recreational harvest (in pounds).

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[3] 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 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 reviewed by the Council's Scientific and Statistical Committee in September 2021[4] 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

---

[3] 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).
[4] The final report from the SSC review is available at 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[5] 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.

---

[5] 60th 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 (½ 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) * $(B_{msy}-B)/$½ 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. <u>If biomass is above the target (B > B_{MSY}):</u> 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.

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

[a] Old MRIP estimates provided to the National Marine Fisheries Service Greater Atlantic Regional Fisheries Office by the Northeast Fisheries Science Center

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

[c] 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. [6]

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

---

[6] 60th 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.

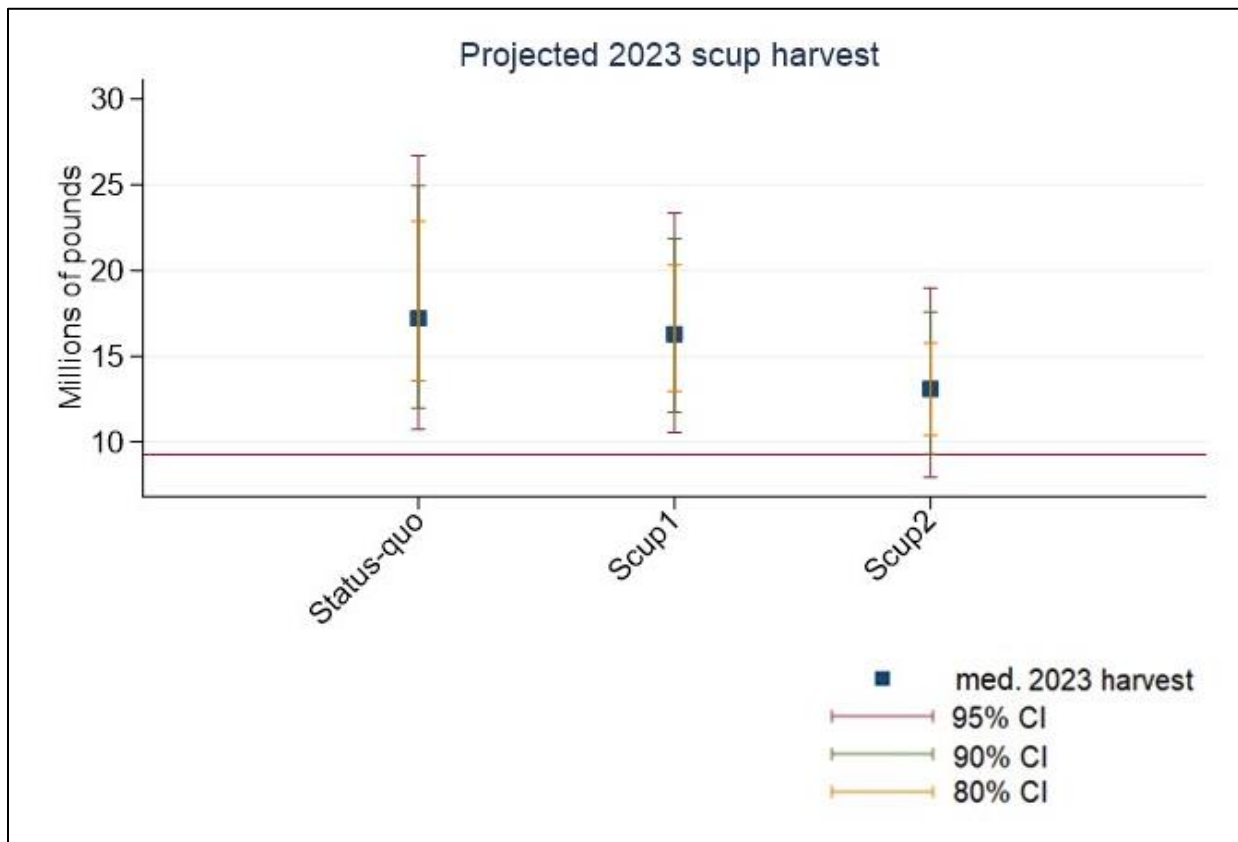| Set of Measures	Minimum Size (inches)	Possession Limit	Season
Scup 1	Status quo (2022 measures; 9 or 10 inches depending on state; see Table 3)	15 fish	Open year-round
Scup 2	1-inch increase in state and federal waters	Status quo (2022 measures; 30 or 50 fish depending on state and mode; see Table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

Summer Flounder, Scup, and Black Sea Bass Monitoring Committee
Webinar Meeting Summary
October 26, 2022

Monitoring Committee Attendees: Tracey Bauer (ASMFC), Julia Beaty (MAFMC), Peter Clarke (NJ DFW), Kiley Dancy (MAFMC), Lorena de la Garza Hernandez (NC DMF), Steve Doctor (MD DNR), Alexa Galvan (VMRC), Hannah Hart (MAFMC), Emily Keiley (NMFS), Dustin Colson Leaning (ASMFC), John Maniscalco (for Rachel Sysak; NY DEC), Mark Terceiro (NEFSC), Corinne Truesdale (RI DFW), Greg Wojcik (CT DEP), Rich Wong (DE DFW)

Other Attendees: Katie Almeida, Chris Batsavage, Alan Bianchi, Lou Carr-Harris, Joe Cimino, Geret DePiper, Greg DiDomenico, James Fletcher, Jeff Kaelin, Kathryn, Meghan Lapp, Jason McNamee, Brandon Muffley, Willow Patten, Marisa Ponte, Will Poston, Scott Steinback

The Summer Flounder, Scup, and Black Sea Bass Monitoring Committee (MC) met via webinar on Wednesday, October 26, 2022 to review the Percent Change Approach for setting recreational measures, accountability measures, outcomes of the Summer Flounder Management Strategy Evaluation, and two statistical models which will be available for setting 2023 recreational measures for all three species (i.e., the Recreational Demand Model and the Recreational Fleet Dynamics Model).

Briefing materials considered by the Monitoring Committee are available at:
https://www.mafmc.org/council-events/2022/summer-flounder-scup-and-black-sea-bass-monitoring-committee.

Percent Change and Accountability Measures

Council staff presented an overview of the Percent Change Approach which was approved by the Council and the Policy Board through the Recreational Harvest Control Rule Framework/Addenda. This approach will be used to set 2023 recreational bag, size, and season limits for summer flounder, scup, and black sea bass.

Council staff also noted that a recreational accountability measure (AM) was triggered for scup and black sea bass due to an overage of the average 2019-2021 annual catch limits. The NMFS Greater Atlantic Regional Fisheries Office (GARFO) sent a letter to the Council which stated that, given actions taken by the Council and Board over the past year, no additional action is needed to address the AM for scup or black sea bass.

The MC discussed the intersection between the AMs and the Percent Change Approach. It was noted that the Percent Change Approach and the AMs work together. One does not supersede the other. Additional discussion will take place during the November 15 MC meeting when the group will finalize their recommendations for the percent change in harvest needed for 2023.

Summer Flounder Management Strategy Evaluation (MSE)

Council staff provided an overview of the recently completed Summer Flounder MSE. The MSE evaluated the biological and economic benefits of minimizing recreational summer flounder discards and converting discards into landings, as well as identify management procedures to effectively realize these benefits. Council staff asked the MC for feedback on how to apply the result of the MSE to development of 2023 recreational measures, and additionally how the MSE could be applied in future recreational management considerations. The MSE management procedures (options for bag, size, and season limits) were intended to be illustrative of general management concepts and not designed specifically for 2023; therefore, the specifics of the options would likely need modification for 2023 depending on the percent change in harvest needed for summer flounder. MC feedback included:

- The MC agreed that it may be worth further exploring only the management procedures that preformed notably better than the 2019 measures (referred to as status quo measures in the MSE). For example, Management Procedure 3 (status quo regions, modified season of April 1-October 31) performed similarly to the 2019 measures and therefore may not warrant further consideration.

- The results of the management procedures which included coastwide measures can help inform selection of coastwide measures, either as the preferred set of measures or as non-preferred coastwide measures under conservation equivalency.
    - However, one MC member questioned how much support there might be for true coastwide measures and noted that it may be difficult to apply some of the evaluated management procedures given the variation in performance across states.
    - Management Procedure 8 (true slot limit, 3 fish possession limit between 16-20 inches from May 1-September 30) may not be a viable option for coastwide measures. For example, anglers in New Jersey and Virginia have voiced support for allowing harvest of some fish larger than the slot limit. This option also had a slightly increased risk of overfishing compared to other options. Although this approach had some benefits, some MC members said the benefits did not seem to justify the slightly increased risk of overfishing.

- One MC member recommended reorganizing the state specific results in geographic order to more easily evaluate of how well each set of measures performed on a latitudinal/regional basis (i.e., north vs. south) which may help inform considerations for regional measures.

- One MC member asked if the impacts would differ from those presented if the implemented management procedure varied by state. Given that most management procedures outperformed 2019 measures, a mixed approach may still have benefits. However, this has not yet been evaluated.

- Some MC members questioned the realism of some management procedure results. For example, one MC member said it does not necessarily seem logical that under a reduced minimum size with no other changes (Management Procedure 2) the stock size would increase over time.
    - Staff responded that the stock doesn't grow under this management procedure but rather hovers around B_{MSY}. Hypothetically, decreasing the minimum size under Management Procedure 2 would shift recreational selectivity and likely lower the F_{MSY} proxy.

○ Measures like the slot option can also change selectivity, focusing mortality on a narrower range, which generally pushes the stock lower relative to the biomass reference point.

Recreational Demand Model

Lou Carr-Harris (Northeast Fisheries Science Center; NEFSC) presented on the Recreational Demand Model (RDM), which has been developed for all three species. The RDM uses data from the NEFSC's 2022 Angler Choice Experiment Survey, Marine Recreational Information Program (MRIP) data, volunteer angler data, NOAA's 2016-2017 National Marine Recreational Fishing Expenditure Survey data, and statistical catch at age frequencies from the NEFSC stock assessments for all three species. The 2022 Angler Choice Experiment Survey provides data to estimate anglers' likelihood of taking a fishing trip based on the numbers of various species they would be expected to retain and discard as well as trip costs. The RDM couples anglers' estimated preferences with projections of availability of different size classes based on the most recent stock assessment and simulates projections for harvest under a specified set of management measures. This model was used to generate preliminary estimates of 2023 harvest and discards in weight under current measures for each species.

Questions and feedback from the MC were as follows:

- In addition to estimating harvest and discards, the RDM can also estimate angler welfare under modeled regulations (derived from the estimated willingness to pay for a particular trip). An MC member asked how sensitive the results were to input parameters, for example, cost per trip which has changed over time, as well as how the satisfaction values were calculated.
    - In the model, angler satisfaction or "utility" is calculated using (1) the estimated utility parameters from the behavioral model and (2) the expected catch and trip costs. This utility value is then translated to a probability of taking a trip. Angler satisfaction is not expressed as a percent satisfied value out of 100. For the cost per trip, while the presentation mentioned an example which was representative of the average trip across all modes, the simulation model actually draws from a wider distribution of variable trip costs. Trip costs derived from the 2017 marine expenditure survey and used in the model will be adjusted for inflation in subsequent model runs.
- The MC was interested to know how angler preferences have changed over the two angler choice surveys (i.e., the 2010 survey used in the first iteration of this model and the 2022 survey used in the recent update). Lou responded that a thorough comparison has not yet been completed. Preferences changed slightly, but the species rankings did not change (i.e., summer flounder was the most valuable, followed by black sea bass, then scup). The survey methods also varied slightly across the two surveys (e.g., the 2010 survey was conducted as an add-on to the shoreside intercept survey and had four versions across different regions that varied in the species presented to survey respondents, while the 2022 survey was conducted as a separate online survey and was uniform across regions).
- Discussion between the MC and the modelers clarified a few things about the configuration of the model:
    - The RDM incorporates information about the probability of taking a trip from the Angler Choice Experiment Survey. These probabilities are affected by the keep and release ratios for all fish. For example, the probability of taking a trip for

summer flounder considers the likelihood of catching scup and black sea bass as well. The regulations for all three species are interactive in terms of their effect on angler behavior.

  - o The RDM does not incorporate preliminary 2022 MRIP data. The projections of 2023 harvest do not account for preliminary wave 1-4 2022 data and are calibrated on 2021 data.
  - o The MC briefly discussed the weight/length relationships used in the RDM and recommended no changes. However, since the October 26 committee meeting, more recent black sea bass weight/length relationship data has been obtained and incorporated into the model.

- The MC discussed the need to consider confidence intervals and how they apply to the percent change approach. Based on preliminary RDM results presented at the meeting for estimated 2023 harvest, it was expected that most configurations of a confidence interval would result in the 2023 RHL falling outside (above for summer flounder and below for scup and black sea bass) that interval of expected harvest for all three species.

  - o Lou clarified that the range of preliminary results presented may be narrower for black sea bass than the other species because the black sea bass results do not yet account for projected 2023 numbers at age and the associated uncertainty in those projections. It may be possible to incorporate these stock projections and provide revised results for the next MC meeting.

- The MC considered whether the model assumption that 100% of 2023 ABC would be caught is appropriate for all three species. The group agreed that this assumption is appropriate given challenges in predicting commercial and recreational dead catch. For example, although the scup and black sea bass recreational ACLs have recently been exceeded, there is not yet enough information to determine how the recently implemented restrictions in measures and other factors are impacting catch in 2022. In addition, the commercial ACLs have not been fully caught for these species in recent years. Both commercial and recreational catch are challenging to predict as they are impacted by a variety of factors other than management measures (e.g., market factors, availability, weather).

Recreational Fleet Dynamics Model

Corinne Truesdale and Jason McNamee (Rhode Island Department of Environmental Management) presented on the Recreational Fleet Dynamics Model (RFDM) for summer flounder, scup, and black sea bass. The RFDM is a shape constrained additive model that can be used to predict future harvest or discards based on historical recreational management measures and stock status variables. Stock status variables included spawning stock biomass, a lagged recruitment variable, and/or the RHL. For each species, discards and harvest were modeled separately. The variables included in each model varied based on which variables best fit the data and some modeler choices about the most logical variables to include. The model can simulate how state or coastwide level adjustments in bag, size, and season limits may affect landings and discards for each species. This model was used to generate preliminary estimates of 2023 harvest and discards (in numbers of fish) under current measures for each species.

The MC discussed the following considerations regarding the RFDM:

- The RFDM currently produces estimates in number of fish.

- o The model could be updated to pounds; however, this would be time consuming as it would require reconstruction of the model framework and datasets.
  - This would also require additional considerations about how to convert discards into weight because MRIP does not generate estimates of discards in weight.
  - It may be possible to make these revisions in a future year; however, given time constraints, it will not be possible to make these revisions in time for setting 2023 measures.
  - However, the model can still be used for 2023 with outputs in numbers of fish. The outputs in numbers of fish could be converted to weight using the average weight of landed and discarded fish.
- One MC member noted that the model results suggest increases in the black sea bass minimum size have been unsuccessful at constraining harvest, which is likely due to recent high availability.
  - o Jason agreed with this comment and noted the model for black sea bass was particularly tricky which is why they truncated the dataset to better capture the current fishery.
  - o For black sea bass discards, the model results show that increasing the minimum size initially increases discards up to a certain size limit, then beyond that size starts to decrease discards.
  - o These harvest and discard results are likely an effect of the populations being so large during time periods when higher minimum size limits have been used, which is likely generating high harvest and discard numbers overall.
- The same MC member asked if the model showed any noticeable response in discards and harvest to changes in bag limits.
  - o Jason noted that for black sea bass, increases in bag limits behave intuitively, with higher bag limits driving discards down.
- The RDFM can show outputs aggregated at the wave/state/year level.
  - o It may be worth comparing the methods states typically use to set measures to the model results. However, this may require doing something similar to what the MSE team did to understand comparisons in a meaningful way, which will not be feasible for 2023.
    - Trying to mathematically recreate the approach used in recent years for setting measures is difficult but theoretically possible.

Continued Monitoring Committee Discussion and Next Steps

- One MC member said it will be important to use the same model through the entire process of determining how to adjust recreational measures. The use of one model for the first step and then switching to the other model for the next step may not be appropriate since the models could result in different outcomes at any step within the process.
- Another MC member agreed and said the MC, Council, and Board should select which model to use based on a clear justification, and evaluation of which model performs better, as opposed to a preferable outcome.
- The RFDM does not include 2020 and 2021 data. MC members voiced support for adding 2021 data but felt excluding 2020 data was appropriate given 2020 recreational harvest estimates were impacted by temporary suspension of shoreside intercept surveys due to the COVID-19 pandemic. NMFS used imputation methods to fill gaps in 2020

catch data with data collected in 2018 and 2019. Some imputation was necessary in 2021, but to a much lesser extent than in 2020.
- The modelers asked the MC for advice on a more fitting name for the Recreational Fleet Dynamics Model.

Public Comment

- An Advisory Panel (AP) member asked for clarification on the GARFO letter related to AMs and the agency's statement that no further reduction to recreational measures is needed.
  - The GARFO representative on the MC explained that more restrictive measures were put in place in 2022 due to overages in 2020 and 2021. The impacts of these adjustments have not yet been evaluated given incomplete 2022 data. The agency is not saying measures in 2023 should necessarily remain status quo, given the Percent Change Approach may call for a reduction. However, the previous (2022) reductions will satisfy the requirement of the AMs and no additional action beyond the specified percent change is needed because of the AMs.
- An AP member asked if there is any analysis that shows the number of times an angler has been surveyed or the number of times an angler retained a bag limit.
  - These data may exist in the MRIP intercept data, but it can get complicated since an intercept is often a boat of multiple anglers. The RDM produces trip-level estimates of harvest; however, the RFDM does not.
- An AP member commented that as the MC moves through this process it will be interesting to reconcile the need to reduce catches and high bag limits if those bag limits are usually not achieved.
- An AP member asked how the for-hire data used in the RDM were collected.
  - The 2022 Angler Choice Experiment Survey asks how many trips anglers took by charter, private, party, from shore, so there is some mode information. However, the for-hire mode is not modeled separately in the RDM.
- An AP member asked if the MSE analyzed which management procedures would best prevent overages, overfishing, and reduce discards.
  - Results demonstrate that some of the analyzed Management Procedures could reduce discards, and result in an increased abilities to retain fish. The analysis focused on catch in reference to overfishing reference points but did not examine performance compared to Recreational Harvest Limits or ACLs.
- A commercial fishing industry representative mentioned that New Jersey's summer flounder slot limit seems to be working well and asked if the MSE or any of the model's presented today could help analyze the effects of a slot limit including smaller sizes (e.g., reducing the lower bound of the slot to 16 inches) to see if it would further reduce discards.
  - This could be considered. It is up to individual states and regions to come up with measures to achieve the percent change required. It was also noted that the MSE has state specific results and one option evaluated was similar to New Jersey regulations.
- An AP member asked how the 2019-2021 overages which triggered an AM for scup and black sea bass compare to the ACLs under the recently revised allocations.

- ○ The 2023 ACLs and RHLs account for the revised allocations. These ACLs could be compared to 2019-2021 catch based on information provided in the briefing materials for this MC meeting. However, this comparison will not be used to determine 2023 measures. Staff clarified that the process for setting 2022 measures will consider how expected 2023 harvest under 2022 measures compares to the 2023 RHLs.

Kiley Dancy

From:	Hart, Hannah
Sent:	Tuesday, November 29, 2022 1:25 AM
To:	Beaty, Julia; Kiley Dancy
Subject:	Fwd: Upcoming Advisory Panel meeting - 11/30/2022

From: James Fletcher <unfa34@gmail.com>
Sent: Monday, November 28, 2022, 11:17 PM
To: Hart, Hannah <hhart@mafmc.org>; Moore, Christopher <cmoore@mafmc.org>; Michael A. Poon <MPoon@pacificlegal.org>
Subject: Re: Upcoming Advisory Panel meeting - 11/30/2022

I HATE TO BE DUMB BUT!   Why is Council promoting discards and killing the largest most reproductive females fish ?
IS NOT BOFFFF   ***BIG OLD FAT FECUND FEMALE FISH "BEST SCIENCE"?***
DOES NOT A TOTAL LENGTH TO BE RETAINED WITH NO DISCARDS COMPLY WITH MANGUSON ACT.?
WHEN WILL COUNCIL COMPLY WITH MANGUSON? Summer Flounder Scup Black Sea Bass or all species
James Fletcher

Kiley Dancy

From: Moore, Christopher
Sent: Tuesday, October 25, 2022 8:58 AM
To: TechStaff
Subject: FW: Save the date - AP webinar meeting Nov 30, 1-5 pm

fyi

From: James Fletcher <unfa34@gmail.com>
Date: Tuesday, October 25, 2022 at 7:38 AM
To: Beaty, Julia <jbeaty@mafmc.org>, Moore, Christopher <cmoore@mafmc.org>, Beal, Robert
<rbeal@asmfc.org>, Batsavage, Chris <chris.batsavage@ncdenr.gov>, Didden, Jason <jdidden@mafmc.org>
Subject: Re: Save the date - AP webinar meeting Nov 30, 1-5 pm

HOW TO FORCE MONITORING COMMITTEE IN LITE OF BEST SCIENCE BOFFF **BIG OLD FAT FECUND FEMALE FISH** A
CHANGE IN RECREATIONAL REGULATIONS ***EEZ & STATE WATERS***
  TOTAL ALLOWABLE LENGTH TOTAL RETENTION NO DISCARDS!!!
**PRESTIGIOUS ELITE RECREATIONAL FISHERS IN EEZ MUST ONLY HAVE THE SAME TOTAL LENGTH AS DEPRIVED SHORE
SIDE FISHERS;; BOTH RECEIVE A VIOLATION FOR THROWING ANY FISH BACH *** NO DISCARDS**** EXAMPLE
***ELIMINATION OF DISCARDS IN SUMMER FLOUNDER** WOULD ALLOW TOTAL **RETENTION** LENGTH TO BE PLUS OR
MINUS 80 INCHES.   FOR PRESTIGIOUS ELITE { TO BRAG ABOUT FISH [**suggest a 6 to 9 ought hook size} NOT REQUIRE** A
6 TO 10 OUGHT HOOK }   HOOK SIZE WOULD ALLOW THE PRESTIGIOUS ELITE {BRAG ABOUT FISH} STILL NO DISCARDS.
PRESTIGIOUS ELITE COULD VOLUNTARY USE HOOK SIZE FOR BLACK SEA BASS & SCUP {must comply to total length no
discard.
Does the Monitoring Committee have authority to consider no discards & total length?
WITH BOFFFF WHY SHOULD REGULATIONS IN EEZ TARGET THE **BIG OLD FAT FECUND FISH? WHY SHOULD PRESTIGIOUS
ELITE BE ALLOWED TO DICTATE DISCARDS ?**
**by not eliminating discards is the Monitoring Committee ASMFC & MAFMC violating Magnuson & ASMFC charter to
prevent physical waste?**

On 10/24/2022 1:22 PM, Beaty, Julia wrote:

> Dear Summer Flounder, Scup, and Black Sea Bass Advisory Panel Members,
>
> Please hold Wednesday November 30, 2022 from 1 pm to 5 pm for a webinar meeting to discuss 2023
> recreational management measures for all three species. During this meeting we will discuss the process
> for setting 2023 bag, size, and season limits; review Monitoring Committee recommendations; and
> discuss AP input and recommendations for 2023 recreational measures.
>
> Webinar connection information and background materials for the AP meeting will be available closer to
> the meeting date.
>
> The Monitoring Committee will meet on October 26 and November 15 to develop their
> recommendations. Please see the Council's calendar web page for more information.
>
> Please let us know if you have any questions.
>
> Sincerely,
> Julia, Kiley, and Hannah (MAFMC staff leads)

Dustin and Tracey (ASMFC staff leads)

Julia Beaty
Fishery Management Specialist
Mid-Atlantic Fishery Management Council
800 N. State Street, Suite 201
Dover, DE 19901
302-526-5250
jbeaty@mafmc.org
Pronouns: She/her/hers

--
United National Fisherman's Association James Fletcher Director 123 Apple Rd Manns Harbor NC 27953 land 252-473-3287 cell 757-435-8475