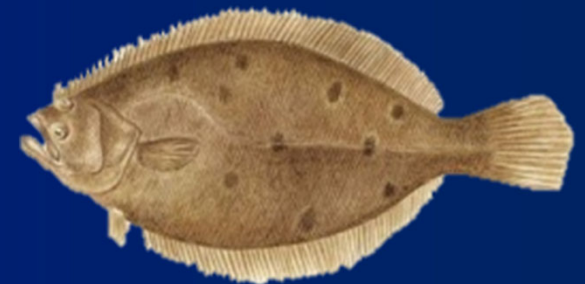


Summer Flounder 2023 Recreational Measures

Monitoring Committee

November 15, 2022



<i>Column 1</i> 2023 RHL vs expected harvest under 2022 measures	<i>Column 2</i> Biomass compared to target level (SSB/SSB_{MSY})	<i>Column 3</i> Change in Harvest
RHL greater than upper bound of expected harvest CI (RHL underage expected)	Very high greater than 150% of target	Liberalization % = difference between harvest estimate and 2023 RHL, not to exceed 40%
	High at least target, but no higher than 150% of target	Liberalization % = difference between harvest estimate and 2023 RHL, not to exceed 20%
	Low below target stock size	Liberalization: 10%
RHL within expected harvest CI (harvest expected to be close to RHL)	Very high greater than 150% of target	Liberalization: 10%
	High at least target, but no higher than 150% of target	No liberalization or reduction: 0%
	Low below target stock size	Reduction: 10%
RHL less than lower bound of expected harvest CI (RHL overage expected)	Very high greater than 150% of target	Reduction: 10%
	High at least target, but no higher than 150% of target	Reduction % = difference between harvest estimate and 2023 RHL, not to exceed 20%
	Low below target stock size	Reduction % = difference between harvest estimate and 2023 RHL, not to exceed 40%

MC Objectives



- Recommend 2023 recreational measures under application of Percent Change Approach
 1. Identify expected 2023 harvest under status quo measures with confidence interval
 2. Compare confidence interval to 2023 RHL
 3. Identify appropriate percent change bin and resulting harvest target
 4. Recommend use of coastwide measures or conservation equivalency to achieve 2023 harvest target, and associated measures

2022 Recreational Measures



- Regional Conservation Equivalency
 - State measures control harvest; federal measures waived
- Non-preferred coastwide measures
 - Implemented in federal regulations, but waived
 - 18.5-inches, 4 fish, May 15-Sept. 15
- Precautionary default
 - “Deterrent” measures
 - 20-inch TL, 2 fish, July 1-August 31

2022 State Measures



	Min. Size (in)	Bag Limit	Season
MA	16.5	5 fish	May 21-September 29
RI	18	4 fish	May 3-December 31
RI SHORE	18	2 fish*	
	17	2 fish*	
CT	18.5	4 fish	May 1-October 9
CT SHORE SITES	17		
NY	18.5		
NJ	Slot limit 17-18	2 fish ^b	May 2-September 27
	18	1 fish ^b	
NJ SHORE SITE	16	2 fish	
NJ DE BAY	17	3 fish	
DE, MD, PRFC, VA	16	4 fish	
NC^c	15	1 fish	September 1-30

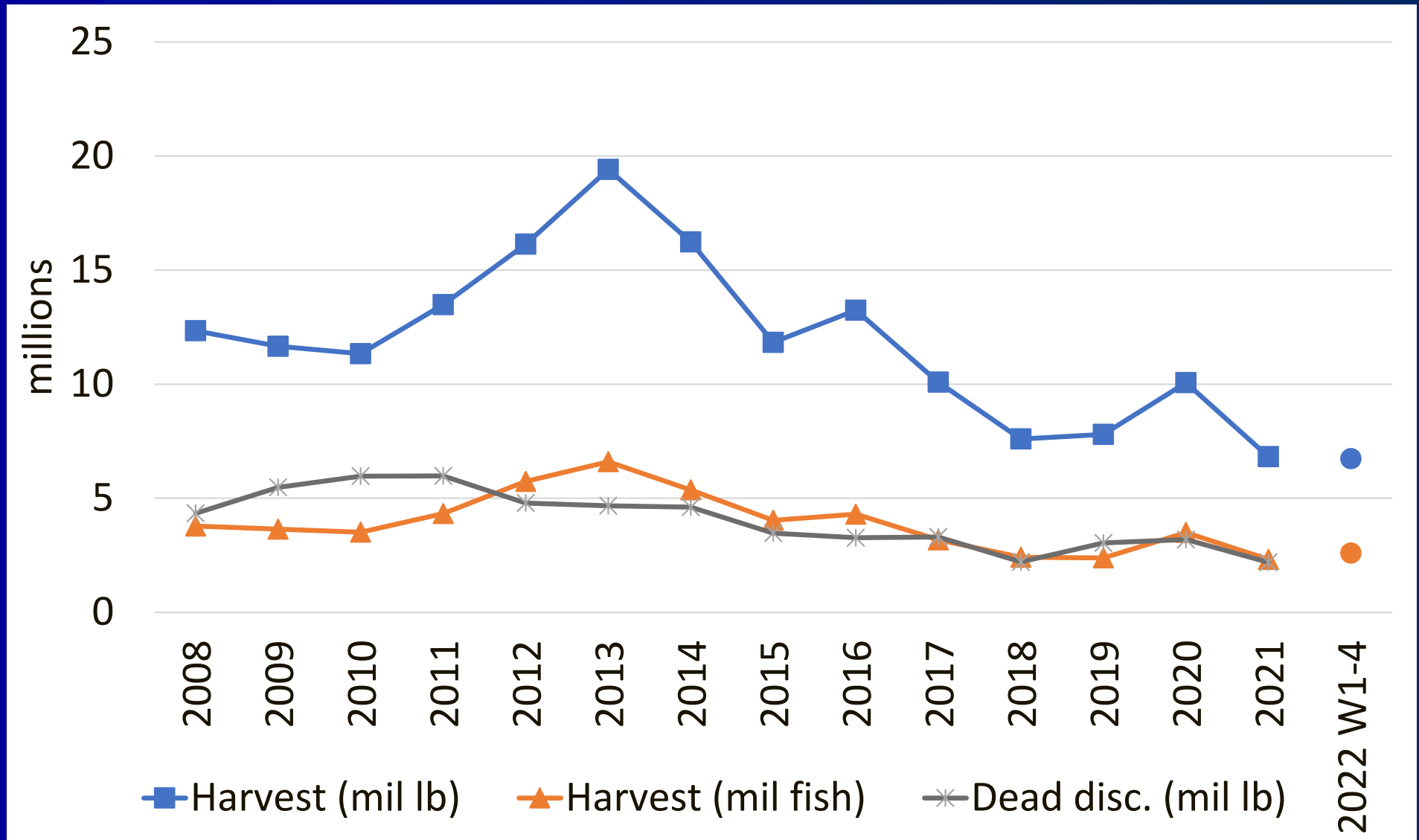
^a Combined limit of 4 fish, no more than 2 at 17 inches

^b NJ slot limit total possession limit of 3 fish: 2 between 17-18; 1 over 18

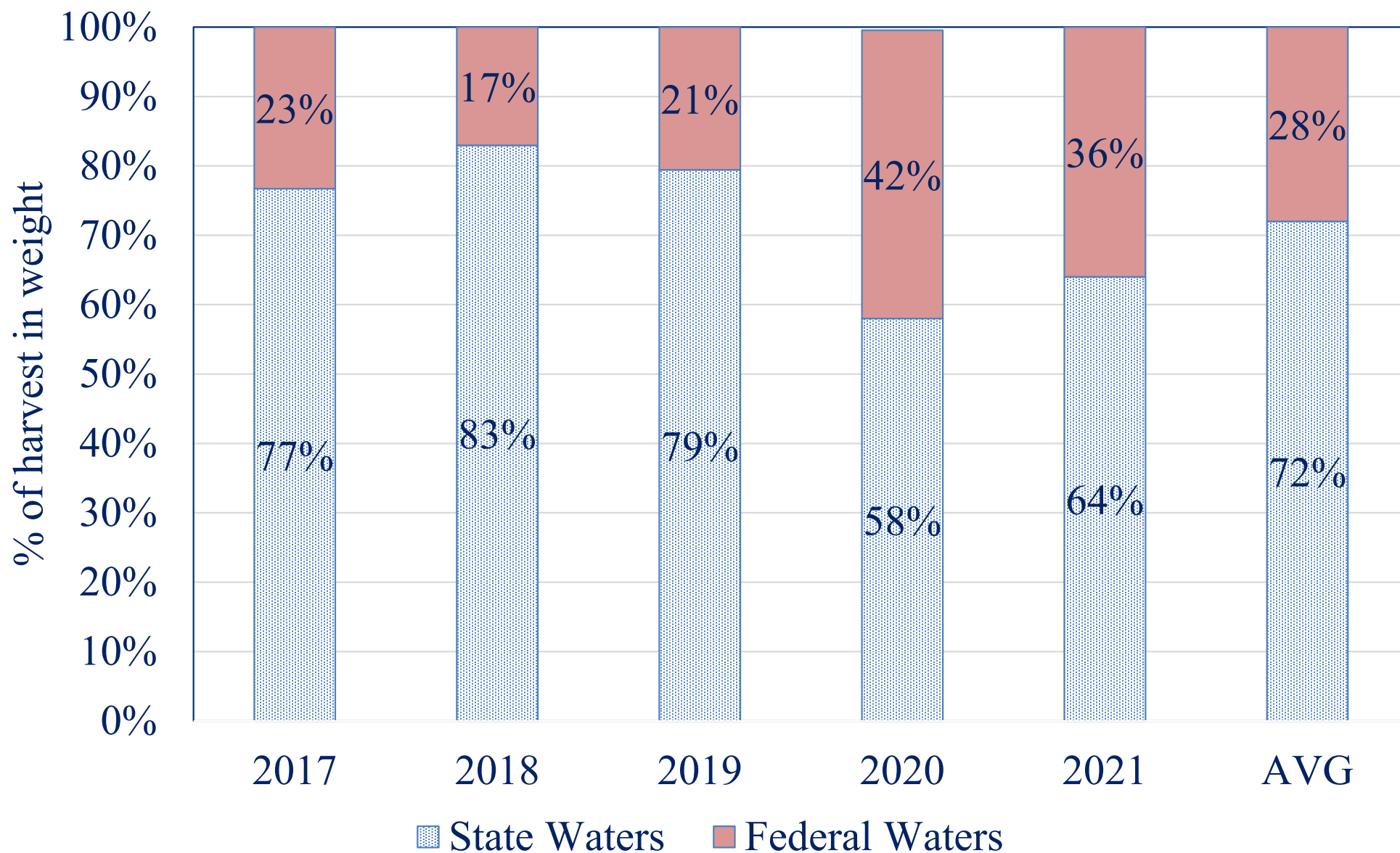
^c NC restrictions to reduce mortality on southern flounder

Harvest & Discards 2008-2021

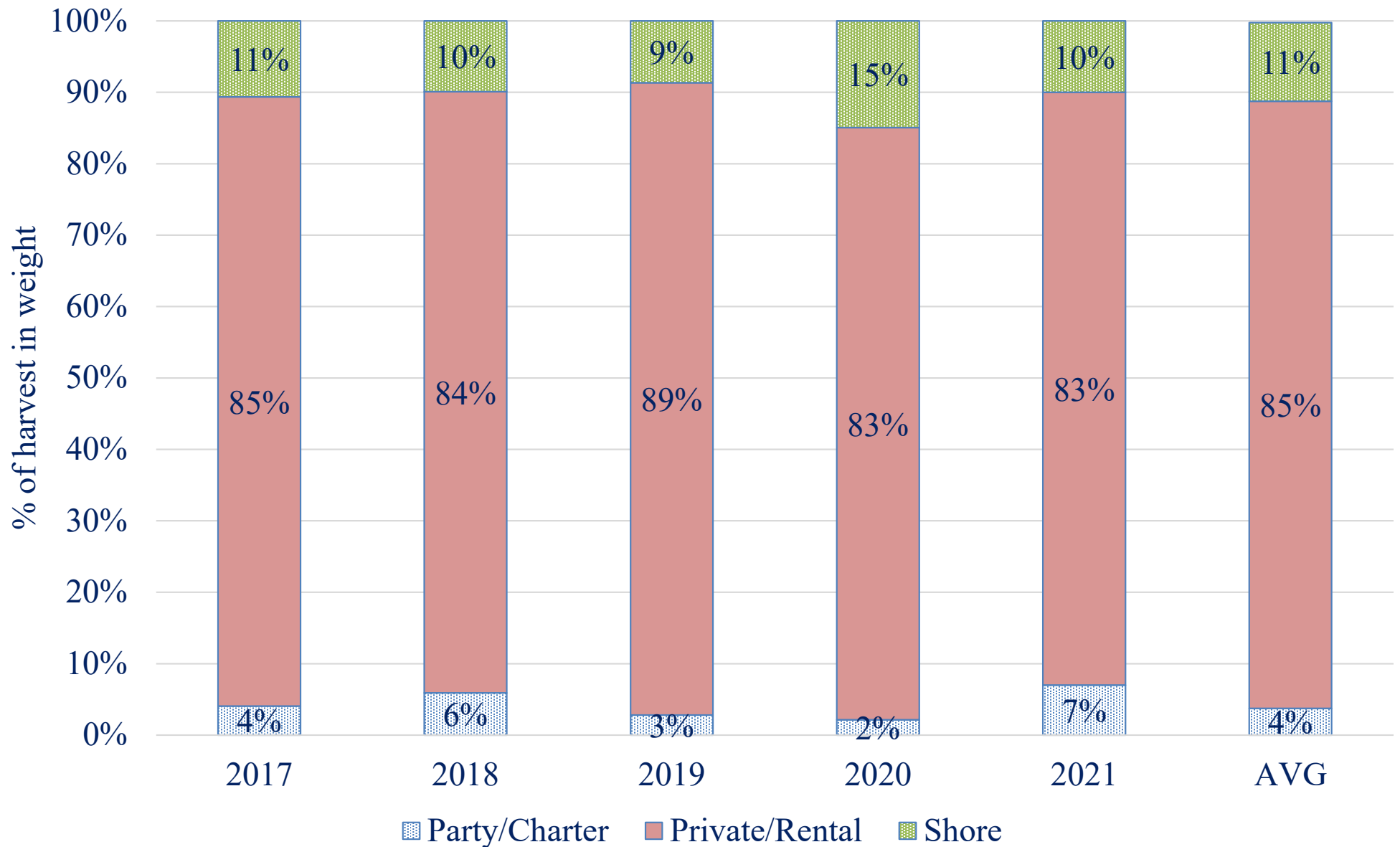
With 2022 Waves 1-4



State vs. Federal Waters Harvest (lb)



Harvest (lb) by mode



Percent Change in Harvest Needed for 2023



- **Percent Change Approach Step 1:**
Compare 2023 RHL to confidence interval around expected 2023 harvest under current (2022) measures
- Used new statistical model(s) to estimate 2023 harvest with CI
 - Vs. past approach of projecting current year harvest and assuming next year's would be similar if measures unchanged

Percent Change in Harvest Needed for 2023



- Staff recommend using RDM to estimate 2023 harvest/CIs, and adjust measures
- Staff memo: RFDM cannot currently model slot limits; likely overestimating harvest due to NJ slot (model assumes 17-in min size in NJ instead)
 - Adjusted estimates available 11/15 for MC consideration

Estimates of 2023 Harvest Under Status Quo (2022) Measures

	Median	95% CI	90% CI	80% CI	2023 RHL
RDM	8.38	6.72 - 10.47	7.04 - 10.03	7.56 - 9.52	10.62
RFDM*	12.77 [With NJ adjust: 10.45 or 10.18]	7.01 - 22.26	7.72 - 20.64	8.55 - 18.79	

*Updated 11/15/22. Converted from numbers of fish using 2021 avg. weight of landed fish

Confidence Interval Around Expected 2023 Harvest



- Percent Change Approach does not specify methods for calculating CIs
- MC should provide advice to Council/Board on appropriate CI for 2023
- **Staff recommend additional discussion/evaluation on this issue in 2023 to inform a more consistent approach to use of CIs**

Confidence Interval Around Expected 2023 Harvest

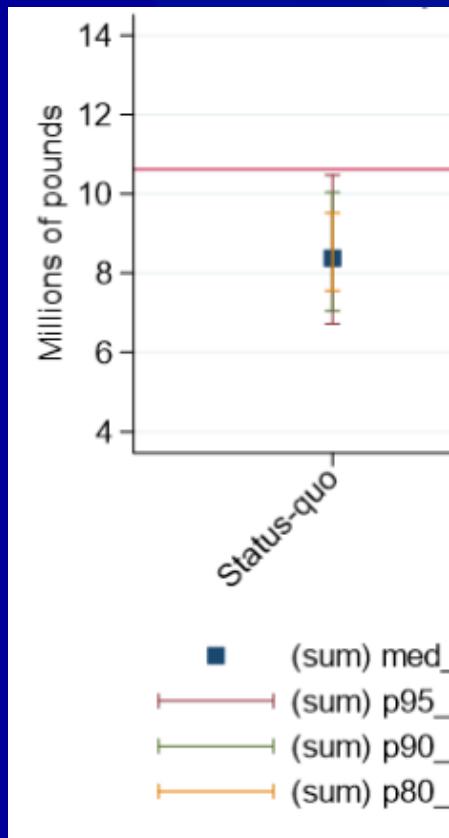


- **For 2023, staff recommend use of 80% CI**
 - Recommended by the Harvest Control Rule FMAT/PDT when considering MRIP data only
 - Models should increase our confidence in ability to predict harvest
 - Higher percentage CIs result in wider range of values: may not be appropriate for applying Percent Change Approach
 - 90% or 95% more likely to contain “true” harvest value, but creates higher likelihood of ending up in an inappropriate PCA bin
- Staff recommend same percentage CI be used for all 3 species

Comparison to 2023 RHL



- All calculated CIs (95%, 90%, 80%) for expected 2023 harvest using RDM are **below the 2023 RHL** (→ expected harvest underage)
- CIs for RFDM all **encompass the 2023 RHL** (not considered in staff rec given likely overprediction by RFDM)



	Median	95% CI	90% CI	80% CI	2023 RHL
RDM	8.38	6.72 - 10.47	7.04 - 10.03	7.56 - 9.52	10.62
RFDM*	12.77 [With NJ adjust: 10.45 or 10.18]	7.01 - 22.26	7.72 - 20.64	8.55 - 18.79	

*Converted from numbers of fish using 2021 avg. weight of landed fish/2019 avg. weight of discarded fish

<i>Column 1</i> 2023 RHL vs expected harvest under 2022 measures	<i>Column 2</i> Biomass compared to target level (SSB/SSB_{MSY})	<i>Column 3</i> Change in Harvest
RHL greater than upper bound of expected harvest CI (RHL underage expected)	Very high greater than 150% of target	Liberalization % = difference between harvest estimate and 2023 RHL, not to exceed 40%
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	Low below target stock size	Reduction % = difference between harvest estimate and 2023 RHL, not to exceed 40%

Rec. Accountability Measures

- 1. If the stock is overfished, under a rebuilding plan, or stock status is unknown:** Exact overage amount must be paid back as soon as possible. Payback may be evenly spread over 2 years if doing so allows for identical measures for the upcoming 2 years.
- 2. If biomass is above the threshold, but below the target, and the stock is not under a rebuilding plan:**
 - **If only the ACL exceeded:** Adjust bag/size/season, taking into account performance of the measures and conditions that precipitated the overage.
 - **If most recent F exceeds Fmsy:** adjustment to the rec. ACT will be made as soon as possible as a payback that will be scaled based on stock biomass where $\text{payback} = (\text{overage amount}) * (B_{msy} - B) / \frac{1}{2} B_{msy}$. Payback may be evenly spread over 2 years if doing so allows for identical measures for the upcoming 2 years. If F/Fmsy not available for most recent year of catch data, catch vs ABC comparison will be used.
- 3. If biomass is above the target:** Adjustments to measures will be made, taking into account the performance of the measures and conditions that precipitated the overage.

Rec. Accountability Measures



- All values in new MRIP currency
- AMs not triggered for summer flounder

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

^a 2020 MRIP harvest estimate incorporated ~19% imputed data

^b 2020-2021 dead discard estimates not available using typical methodology; estimated using 2019 avg. weight of discarded fish and 2020-2021 MRIP discards in numbers

2023 Harvest Target



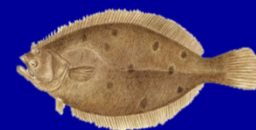
- 10% liberalization is relative to expected 2023 harvest under status quo measures
- Based on RDM median estimate of 8.38 million pounds, resulting harvest target would be **9.21 million pounds**

2023 Staff Recommendation



- Recommend continuation of regional conservation equivalency
- Staff recommend applying MSE results, as discussed at October 26 meeting, to:
 - Development of non-preferred coastwide measures
 - Further exploration of potential state/regional measures under conservation equivalency

Staff Recommendation: Non-Preferred Coastwide Measures



- Non-preferred coastwide measures required under CE; waived in favor of state regulations
- Current: 18.5 inches, 4 fish, May 15-September 15
- Previously, limited ability to analyze coastwide measures due to years of CE, but new models can help analyze expected efficacy of current NP coastwide measures

Staff Recommendation: Non-Preferred Coastwide Measures



- RDM suggests current NP coastwide measures (**18.5 in, 4 fish, May 15-Sept 15**) would be too restrictive for 2023

	Median Harvest (mil lb)	% of 2023 Target (9.21 mil lb)
Current NP Coastwide	5.26	57%

- Requested RDM run of MSE Management Procedure #6 (**17 in, 3 fish, May 1-Sept 30**)

	Median Harvest (mil lb)	% of 2023 Target (9.21 mil lb)
MSE MP#6	10.80	117%

Staff Recommendation: Non-Preferred Coastwide Measures



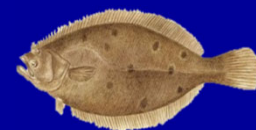
- Staff evaluated modified MP#6: **17.5 inches, 3 fish, May 1-September 30**
- RDM doesn't explicitly model ½ inch increments, but does estimate harvest within each 1-inch bin
 - MP#6 results suggest 28% of harvest in 17-17.99" bin
 - Assume half of this would be landed under 17.5 inch min size
 - Adjusts estimate to 9.28 mil lb: 101% of harvest target of 9.21 mil lb
- **Staff recommend adopting these measures as non-preferred coastwide measures for 2023**

Staff Recommendation: Precautionary Default Measures



- *Status quo* precautionary default measures of **2 fish, 20 inches, July 1-August 31**
- Sufficiently restrictive in all states
- Staff recommend no changes for 2023

Staff Recommendation: Measures Under Conservation Equivalency



- MSE results can generally inform potential improvements to recreational measures process
- Specific management procedures, or modified versions, could be applied under CE in 2023 or future years

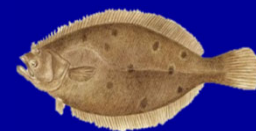
Staff Recommendation: Measures Under Conservation Equivalency



- Staff recommend that under CE, the TC explore measures similar to either:
 - **MP #2: 2019 regulations with 1-inch decrease**

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	16	5 fish	May 23-October 9
Rhode Island	18	6 fish	May 3-December 31
Connecticut	18	4 fish	May 4- September 30
New York	18		
New Jersey	17	3 fish	May 24- September 21
Delaware	16	4 fish	January 1- December 31
Maryland			
Virginia			
North Carolina	15	4 fish	January 1-September 3
 - **MP #7: Modified coastwide slot**
1 fish 16-19 inches; 2 fish over 19 inches, May 1-Sept. 30

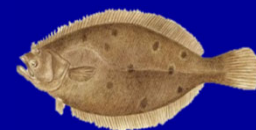
Staff Recommendation: Measures Under Conservation Equivalency



- RDM runs: both MPs as specified in MSE are expected to result in harvest higher than the target
- Measures would need modifications to be consistent with Percent Change Approach

Measures	Harvest Est.	95% CI	90% CI	80% CI	2023 Harvest Target
MP #2 (Status quo regions, modified size)	10.86	8.72-13.42	9.14-12.67	9.69-11.98	9.21
MP#7 (Modified Slot)	10.31	8.53-12.11	8.86-11.53	9.31-11.53	

Staff Recommendation: Measures Under Conservation Equivalency



- MC could consider model runs of modified versions of these measures that may be informative for 2023

Measures	Harvest Est.	95% CI	90% CI	80% CI	2023 Harvest Target
MP #2 (Status quo regions, modified size)	10.86	8.72-13.42	9.14-12.67	9.69-11.98	9.21
MP#7 (Modified Slot)	10.31	8.53-12.11	8.86-11.53	9.31-11.53	

Decision Points



- Recommend estimate of 2023 harvest under 2022 measures and associated CI.
 - *Staff recommend use of RDM and 80% CI.*
- Determine appropriate percent change in harvest required under the Percent Change Approach.
 - *10% liberalization based on staff recommendation.*
- Recommend use of coastwide measures or conservation equivalency for 2023.
 - *Staff recommend conservation equivalency.*
- Recommend 2023 precautionary default and non-preferred coastwide measures under conservation equivalency.
 - *Staff recommend 17.5 inches, 3 fish, May 1-Sept. 30 for NP coastwide*
 - *Staff recommend no changes to prec. default.*
- Thoughts/comments state/regional measures informed by MSE results?

SUPPLEMENTAL

Stock Status: 2021 Management Track Assessment



SSB

- Not overfished in 2019
- 2019 SSB = 47,397 mt, 86% of SSB_{MSY} = 55,217 mt

F

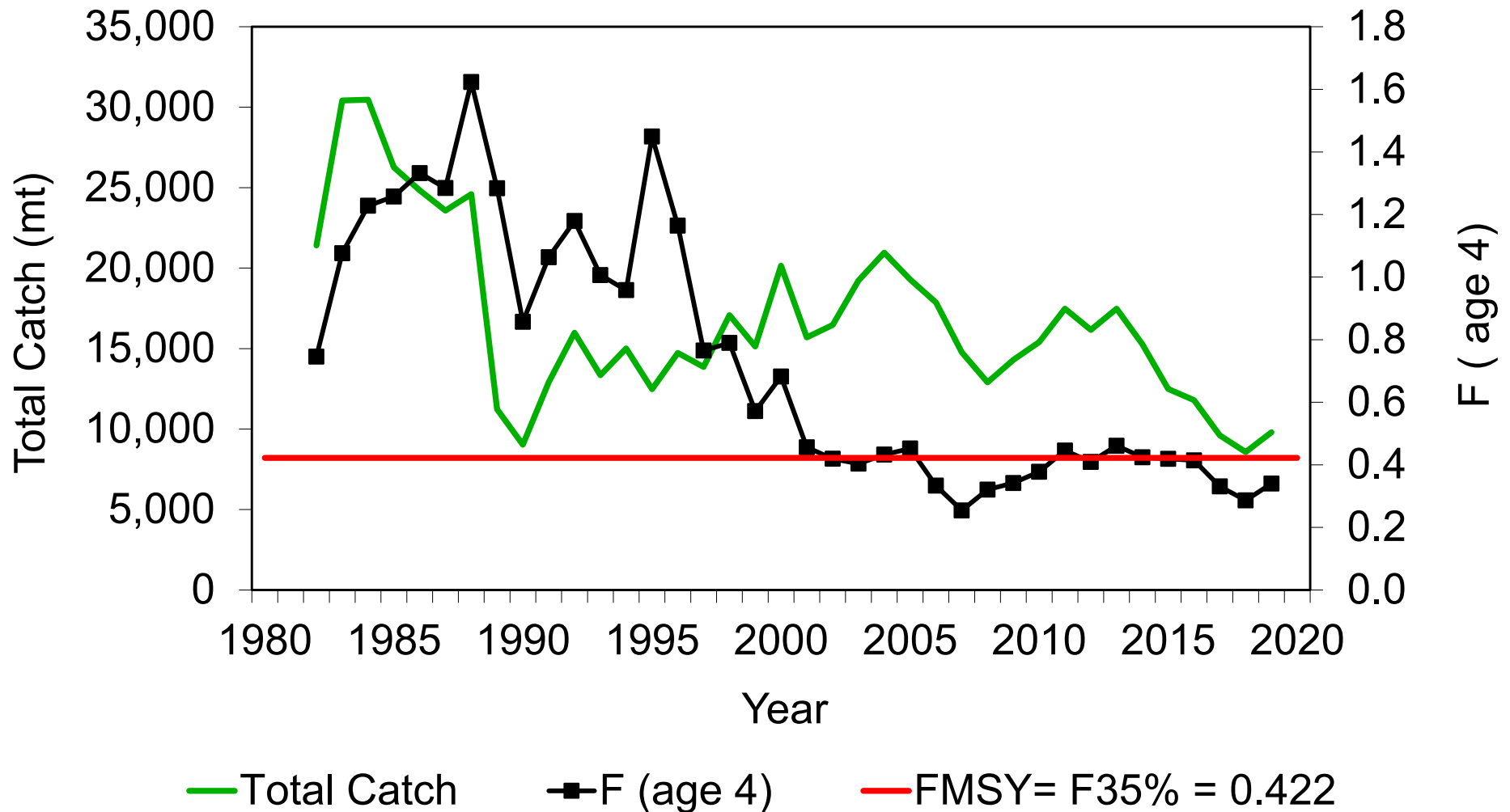
- Overfishing not occurring in 2019
- 2019 $F = 0.340$, 81% of F_{MSY} proxy = 0.422

Fishing Mortality

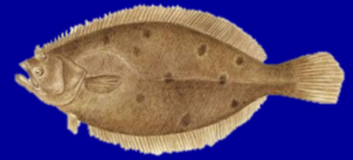
2021 MTA



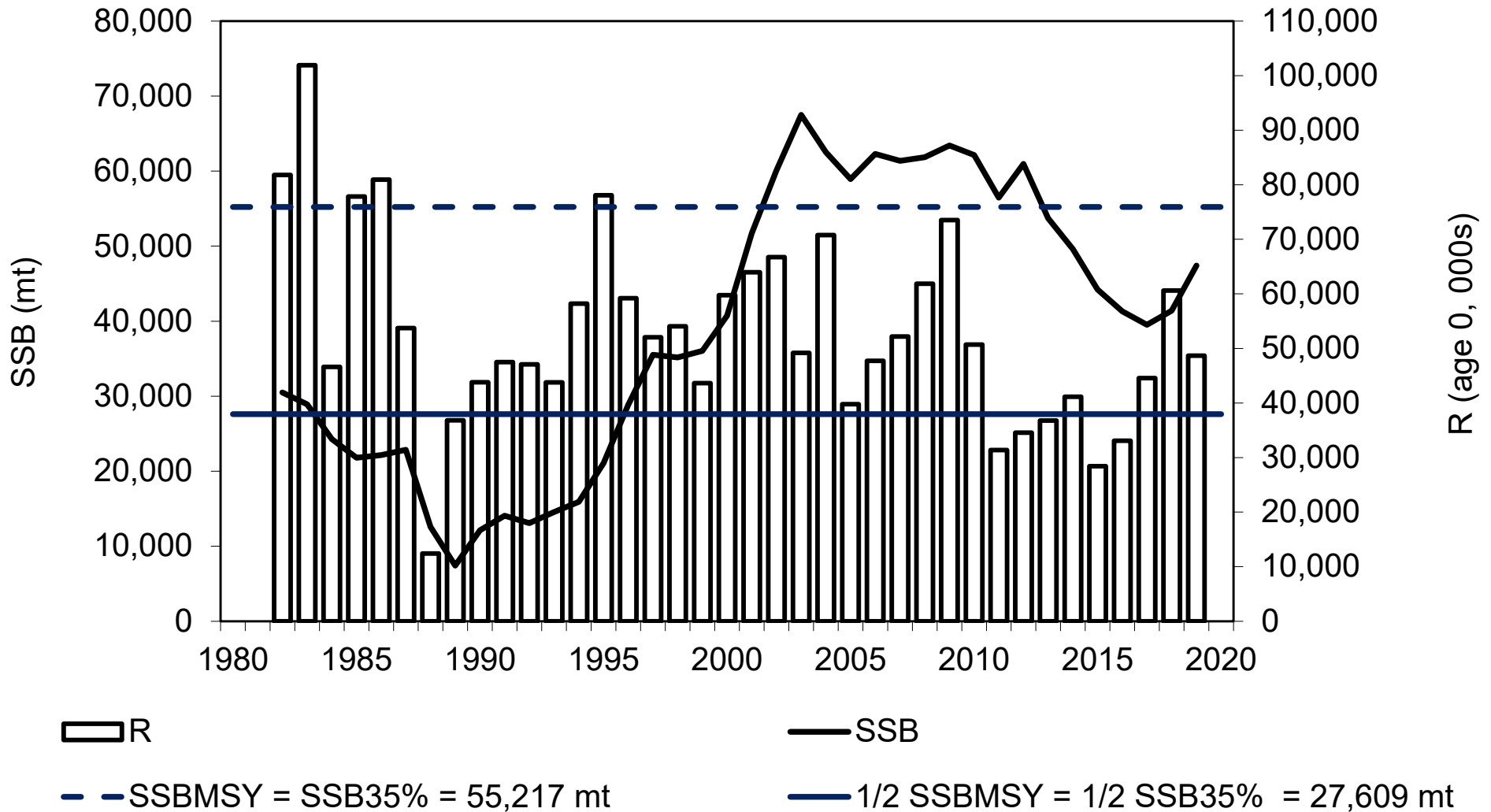
Total Catch and Fishing Mortality (F)



SSB and Recruitment 2021 MTA



Spawning Stock Biomass (SSB) and Recruitment (R)



Data Inputs

Data	Rec. Demand Model	Rec. Fleet Dynamics Model
MRIP harvest and discards	Y	Y
Time series of bag/size/season		
By state	Y	Y
By wave	Y	Y
By mode	N*	Scup only*
Time series of RHLs	N	Y
Angler behavior	Y	N
Stock status		
Numbers at length	Y	N
SSB	N	Y
Recruitment	N	Y

*In future years, model can be modified to account for this for all 3 species if needed.

Other Considerations

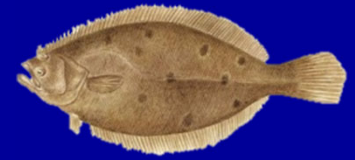
Considerations	Rec. Demand Model	Rec. Fleet Dynamics Model
Peer reviewed by SSC and improved based on review	Y	Y
Accounts for uncertainty and can produce CI	Y	Y
Can evaluate measures at the state/regional level	Y	Y
Can evaluate federal waters measures independently from state waters measures	N	N
Can evaluate slot limits	Y	N*
MC can produce model results on their own	N	Y

*Limited to past measures. May be possible to evaluate slot limits in the future after slots are used and associated MRIP estimates are available.

Information Needed Under Percent Change Approach

Stock	Expected 2023 harvest under 2022 measures, including CI	2023 RHL	Biomass compared to target level	Percent Change Approach Biomass Category
Summer flounder	MC should develop recommendations for these values over the course of their Oct and Nov 2022 meetings.	10.62 mil lb	86%	Low
Scup		9.27 mil lb	196%	Very high
Black sea bass		6.57 mil lb	210%	Very high

RHL Performance



Year	Rec. Harvest OLD MRIP (mil lb)	Rec. Harvest NEW MRIP (mil lb)	RHL (mil lb)	Rec. % Over/ Under*
2017	3.19	10.06	3.77	-15%
2018	3.35	7.60	4.42	-24%
2019	--	7.80	7.69	+1%
2020	--	10.06	7.69	+31%
2021	--	6.82	8.32	-18%
5-yr Avg.				-5%

*RHL comparison uses old MRIP through 2018; new MRIP 2019-2021.

Slide 35

KD0

Should I remove this table? I know we didn't focus on it in the memo but thought it might be useful to quickly recap and then say going forward we're not going to be focusing on the RHL in the same way.

Kiley Dancy, 2022-11-14T13:30:20.923

BJ0 0

I would leave it out of the main presentation to avoid confusion but maybe keep it as a backup slide.

Beaty, Julia, 2022-11-14T14:21:57.806

2022 Preliminary Estimates

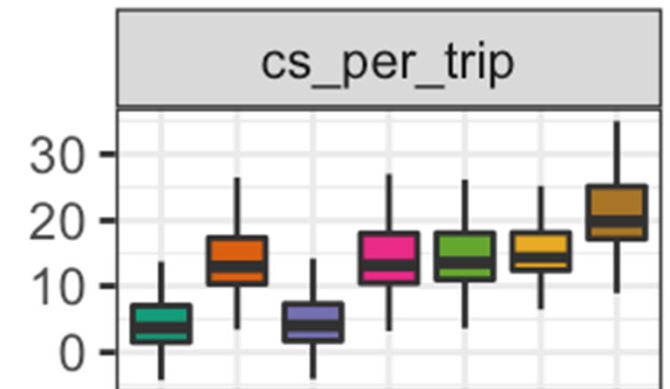
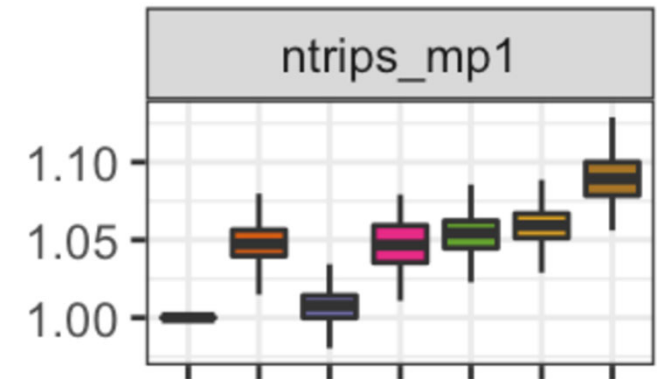
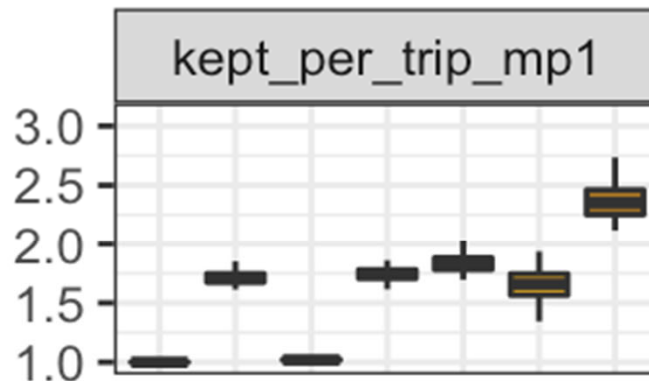
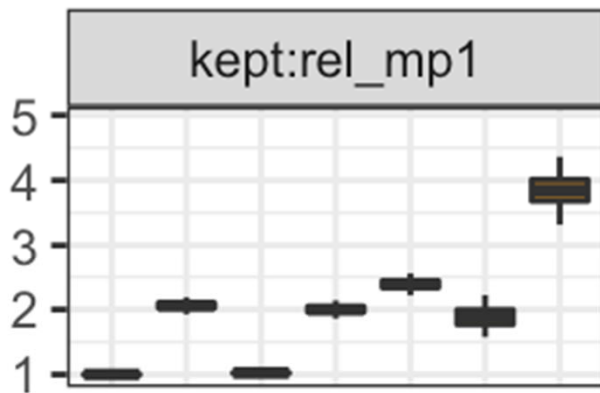
Species	2022 prelim. W1-4 harvest (mil lb)	2022 RHL (mil lb)	% of 2022 RHL
Summer flounder	6.73	10.36	65%
Scup	13.72	6.08	226%
Black sea bass	5.36	6.74	80%

Management Procedures (aka - strategies, regulations)

Management Procedure #	Procedure Explanation
1 (status quo)	Status Quo - 2019 regulations
2 (minsize-1)	2019 regulations but a 1 inch decrease within each state to a minimum of 16 inches
3 (season)	2019 regulations but season of April 1 - Oct 31 for all states
4 (region)	Modified regions: MA-NY - 5 fish, 18 inch min, May 1 - Sept 31 NJ - 3 fish, 17 inch minimum, May 1 - Sept 31 DE-NC - 3 fish, 16 inch minimum, May 1 - Sept 31
5	1 fish, 14 inch minimum, May 15 - Sept 15
6 (c3@17)	3 fish possession limit, 17 inch minimum size, May 1 - Sept 30
7 (c1@16-19)	Modified slot: 1 fish from 16" - 19", 2 fish 19 inches and greater, May 1 - Sept 31
8 (slot)	True slot limit: 3 fish possession limit between 16 inches and 20 inches, May 1 - Sept 31

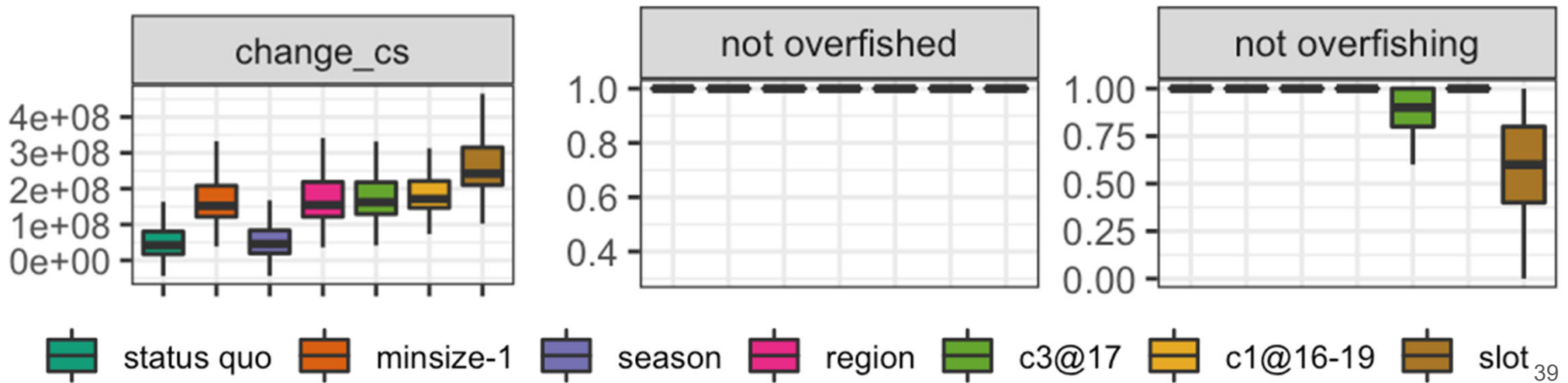
Most management procedures outperformed status quo across the majority of metrics

- Reduce recreational discards
- Provide increased harvest opportunities
- Increase angler welfare
- Greater economic benefits

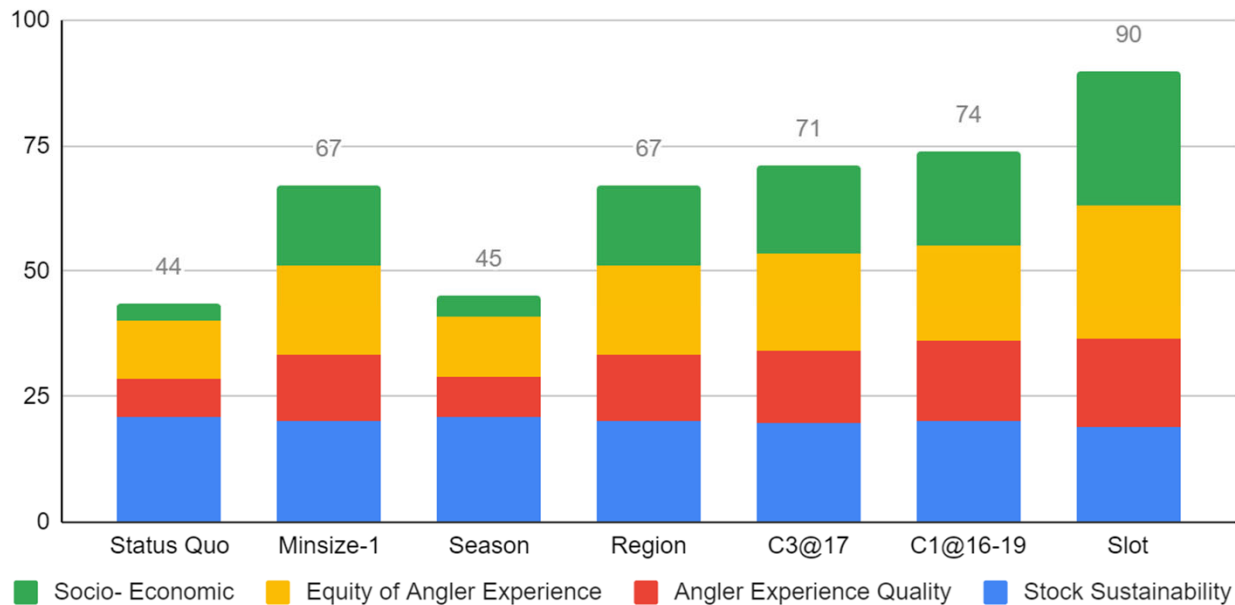


Improved recreational fishery outcome did not come at expense of conservation status.

- No management procedure resulted in stock being overfished.
- Most had low risk of overfishing



Based on stakeholder preferences, proposed management procedures are expected to increase stakeholder satisfaction.



- MPs provide 4-106% increase in perceived performance
- Driven by socioeconomic, equity, and experience improvements
- ‘Slot’ had the highest score across weighting schemes,
 - Robust to range of stakeholder preferences, always ranking best