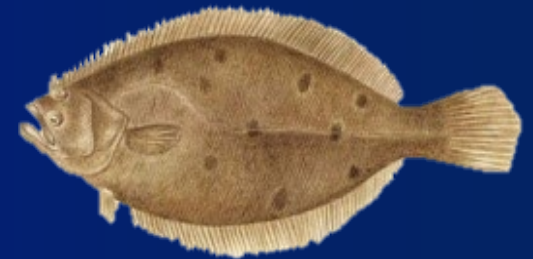


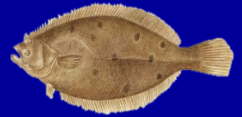
Summer Flounder 2023 Recreational Measures

Monitoring Committee

November 30, 2022



AP Objectives



- Review recent recreational fishery performance
- Review Monitoring Committee recommendations for 2023 recreational management measures
- Provide input to the Council and Board on 2023 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	
RI SHORE	18	2 fish*	May 3-December 31
	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

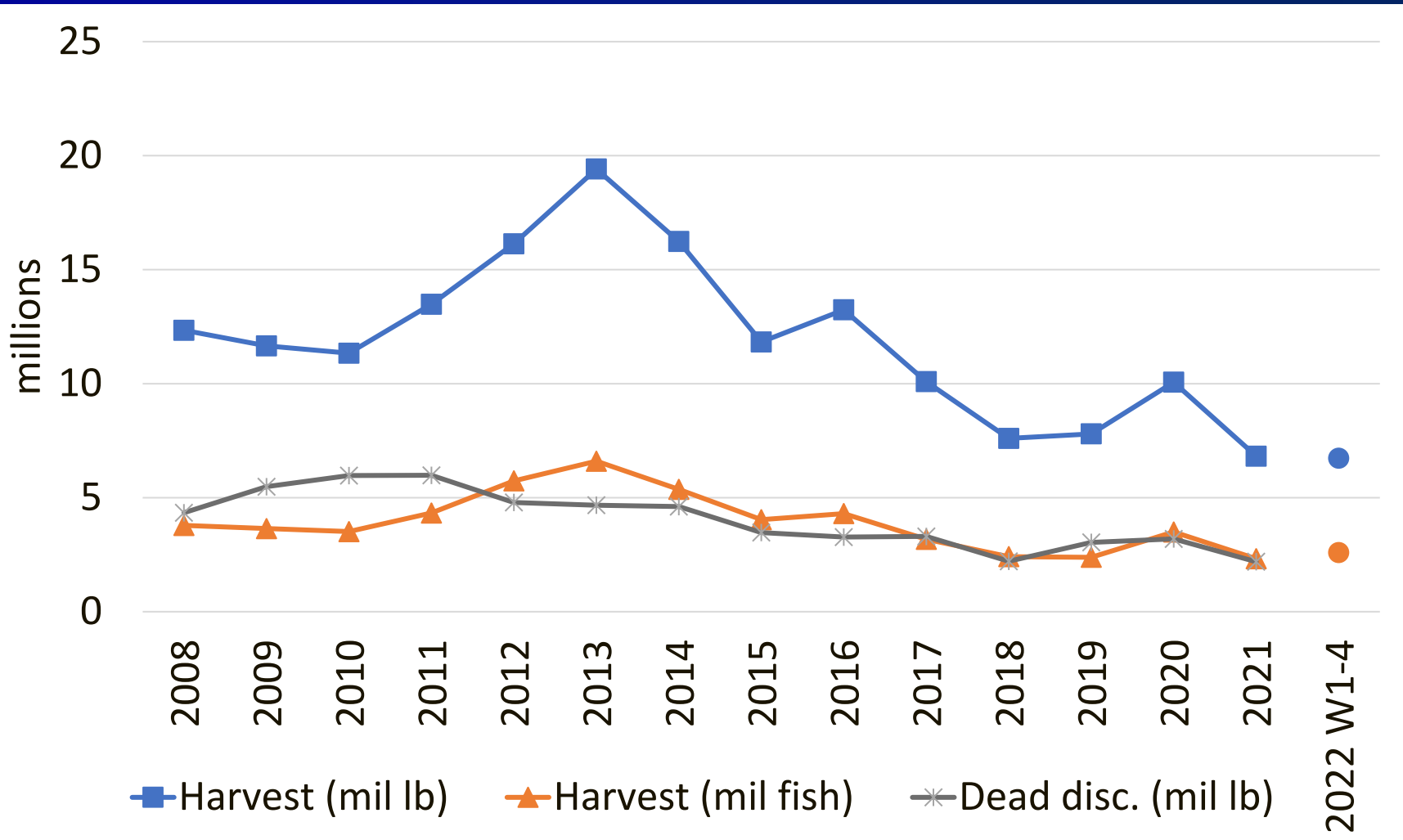
^a Combined limit of 4 fish, no more than 2 at 17 inches

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

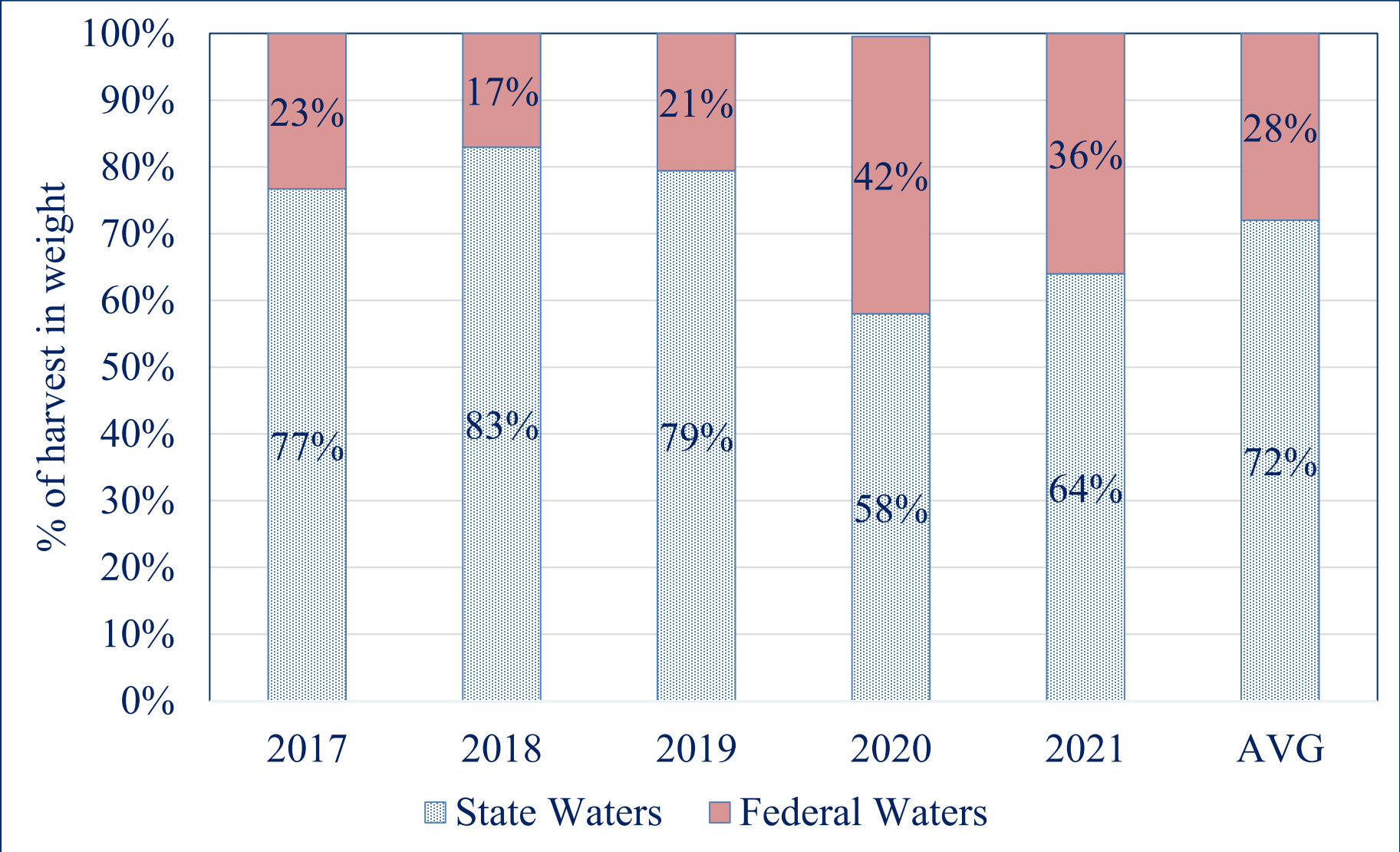
^c NC restrictions to reduce mortality on southern flounder

Harvest & Discards 2008-2021

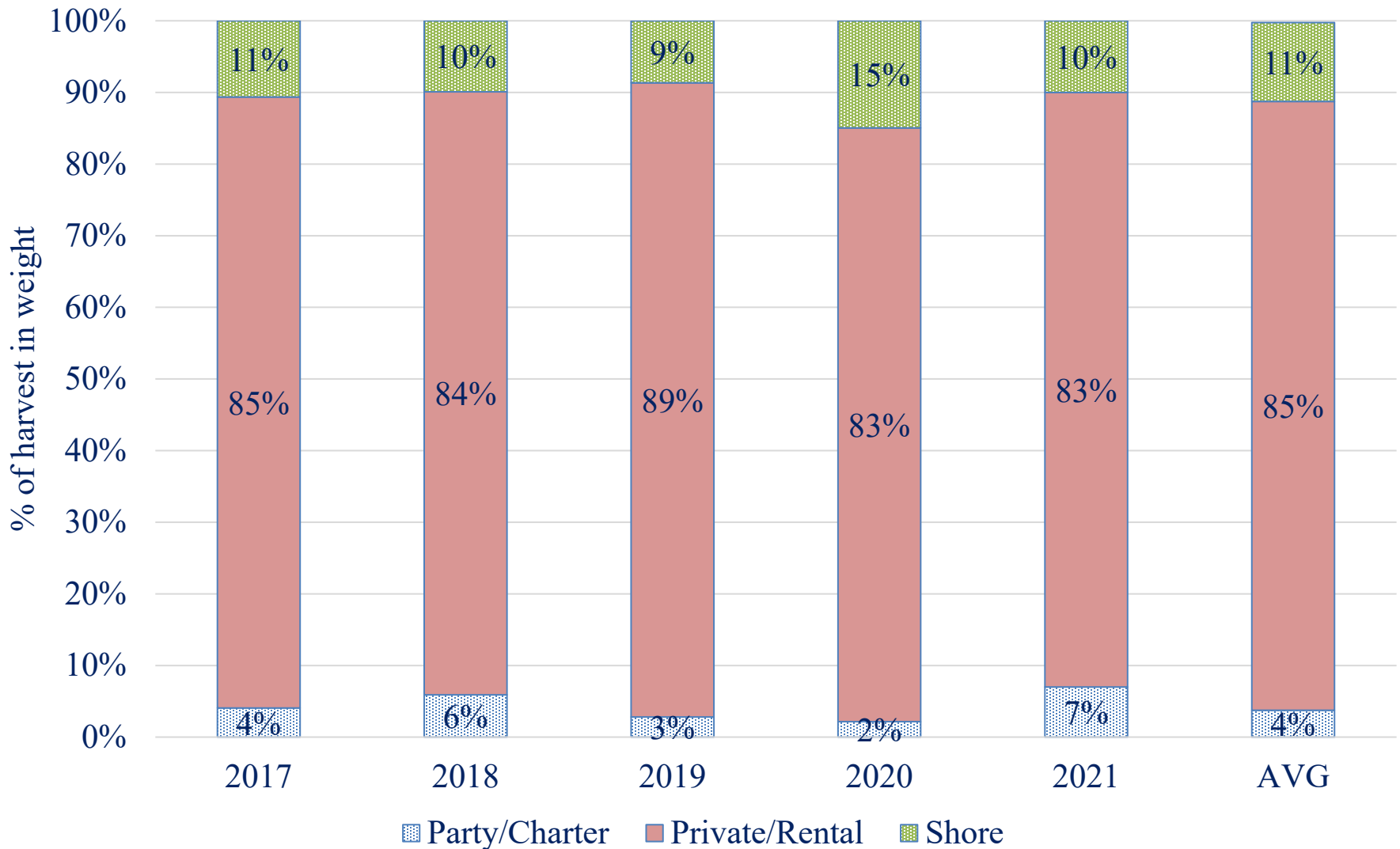
With 2022 Waves 1-4



State vs. Federal Waters Harvest (lb)



Harvest (lb) by mode



<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%

New Tools for Predicting Harvest

- Recreation Demand Model (RDM)
- Recreational Fleet Dynamics Model (RFDM)
- Both are an improvement over past methods of using only MRIP data to predict future harvest

- MC recommends use of **RDM** for setting 2023 summer flounder rec. measures
 - Model performs well for summer flounder
 - RDM was used in summer flounder MSE
 - RDM can model slots
 - RFDM is not currently able to model slot limits: overpredicts harvest given NJ 2022 slot

2023 Expected Harvest vs. RHL



- **Percent Change Approach Step 1:**
Compare 2023 RHL to confidence interval around expected 2023 harvest under current (2022) measures

Column 1
2023 RHL vs
expected harvest
under 2022 measures

RHL greater than upper
bound of expected
harvest CI (RHL
underage expected)

RHL within expected
harvest CI
(harvest expected to be
close to RHL)

RHL less than lower
bound of expected
harvest CI
(RHL overage expected)

Confidence Interval Recommendation



Column 1 2023 RHL vs expected harvest under 2022 measures

RHL greater than upper
bound of expected
harvest CI (RHL
underage expected)

RHL within expected
harvest CI
(harvest expected to be
close to RHL)

RHL less than lower
bound of expected
harvest CI
(RHL overage expected)

- MC recommends use of **80% CI** for all 3 species in 2023
 - Recommended by Harvest Control Rule FMAT/PDT based on evaluation of MRIP data
 - Higher percentage CIs result in wider range of values; may result in action under Percent Change Approach that is not appropriate for “true” fishery condition
- MC supported continued discussion of this topic in 2023 for setting measures for 2024 and beyond

Model to Estimate 2023 Harvest



Column 1
**2023 RHL vs
 expected harvest
 under 2022 measures**

RHL greater than upper
 bound of expected
 harvest CI (RHL
 underage expected)

RHL within expected
 harvest CI
 (harvest expected to be
 close to RHL)

RHL less than lower
 bound of expected
 harvest CI
 (RHL overage expected)

- Under MC recommendation to use RDM and 80% CI: RHL is greater than upper bound of expected harvest CI

	Median	80% CI	2023 RHL
RDM	8.38	7.56 - 9.52	10.62

Resulting Percent Change for 2023



- 10% liberalization in harvest
- Applied to estimate of 2023 harvest under 2022 measures
- Under MC recommendation using RDM: 8.38 mil lb + 10% = **9.21 mil lb harvest target for 2023**

2023 RHL vs expected harvest under 2022 measures	Biomass compared to target level	Change in Harvest
RHL greater than upper bound of CI (RHL underage expected)	Very high	Liberalization % = difference between harvest estimate and 2023 RHL, not to exceed 40%
	High	Liberalization % = difference between harvest estimate and 2023 RHL, not to exceed 20%
	Low	Liberalization: 10%
RHL within CI (harvest expected to be close to RHL)	Very high	Liberalization: 10%
	High	No liberalization or reduction: 0%
	Low	Reduction: 10%
RHL less than lower bound of expected harvest CI (RHL overage expected)	Very high	Reduction: 10%
	High	Reduction % = difference between harvest estimate and 2023 RHL, not to exceed 20%
	Low	Reduction % = difference between harvest estimate and 2023 RHL, not to exceed 40%

Rec. Accountability Measures



- All values in new MRIP currency
- AMs not triggered for summer flounder – no additional adjustments needed

	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

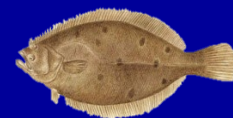
^b 2020-2021 dead discard estimates not available using typical methodology; estimated using 2019 avg. weight of discarded fish and 2020-2021 MRIP discards in numbers

2023 MC Recommendations



- Recommend continuation of regional conservation equivalency in 2023 using the same regions as 2022
 - Federal measures waived; combination of regional measures designed to achieve harvest target

MC Recommendation: Non-Preferred Coastwide Measures



- Non-preferred coastwide measures required under CE; waived in favor of state regulations
- RDM suggests current NP coastwide measures (**18.5 in, 4 fish, May 15-Sept 15**) would be too restrictive for 2023

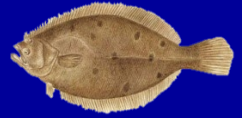
	RDM estimate of median harvest in 2023 (mil lb)	% of 2023 Target (9.21 mil lb)
Current NP Coastwide: 18.5 in, 4 fish, 5/15-9/15	5.26	57%

MC Recommendation: Non-Preferred Coastwide Measures



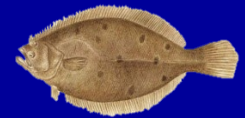
- MC recommendation: **17.5 inches, 3 fish, May 1-September 30**
- Modified version of a set of measures evaluated through Council's summer flounder Management Strategy Evaluation (MSE)
 - MSE Management Procedure #6 (17 inches, 3 fish, May 1-September 30): harvest estimated from RDM was 17% higher than target
 - Staff/MC recommendation adjusted minimum size up 1/2"; estimated that this combination would be close to target

MC Recommendation: Precautionary Default Measures



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

Staff Recommendation: Measures Under Conservation Equivalency



- Council staff had recommended that under CE, the TC explore measures similar to either:

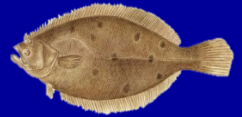
- **MP #2: 2019 regulations with 1-inch decrease**

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**

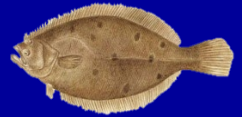
1 fish 16-19 inches; 2 fish over 19 inches, May 1-Sept. 30

MC Recommendation: Measures Under Conservation Equivalency



- MC instead supported giving each region flexibility to develop measures that achieve regional targets
- Did not support exploring coastwide options at this time due to equitability concerns
 - Some coastwide options would not allow some regions to liberalize equally or at all

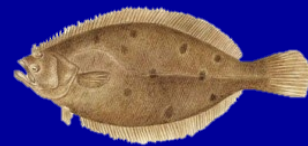
MC Recommendation Summary



- Percent Change Approach with use of Recreational Demand Model & 80% CI results in:
 - 10% liberalization relative to expected 2023 harvest
 - 2023 target would be: 9.21 million pounds
- Continuation of regional conservation equivalency
- Adjust non-preferred coastwide measures to 17.5 in, 3 fish, May 1-Sept. 30
- No changes to precautionary default measures (20 in, 2 fish, Jul 1-Aug 31)
- Give regions flexibility to adjust measures rather than adopting a particular summer flounder MSE approach

SUPPLEMENTAL

Stock Status: 2021 Management Track Assessment



SSB

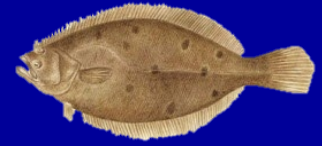
- Not overfished in 2019
- 2019 SSB = 47,397 mt, 86% of SSB_{MSY} = 55,217 mt

F

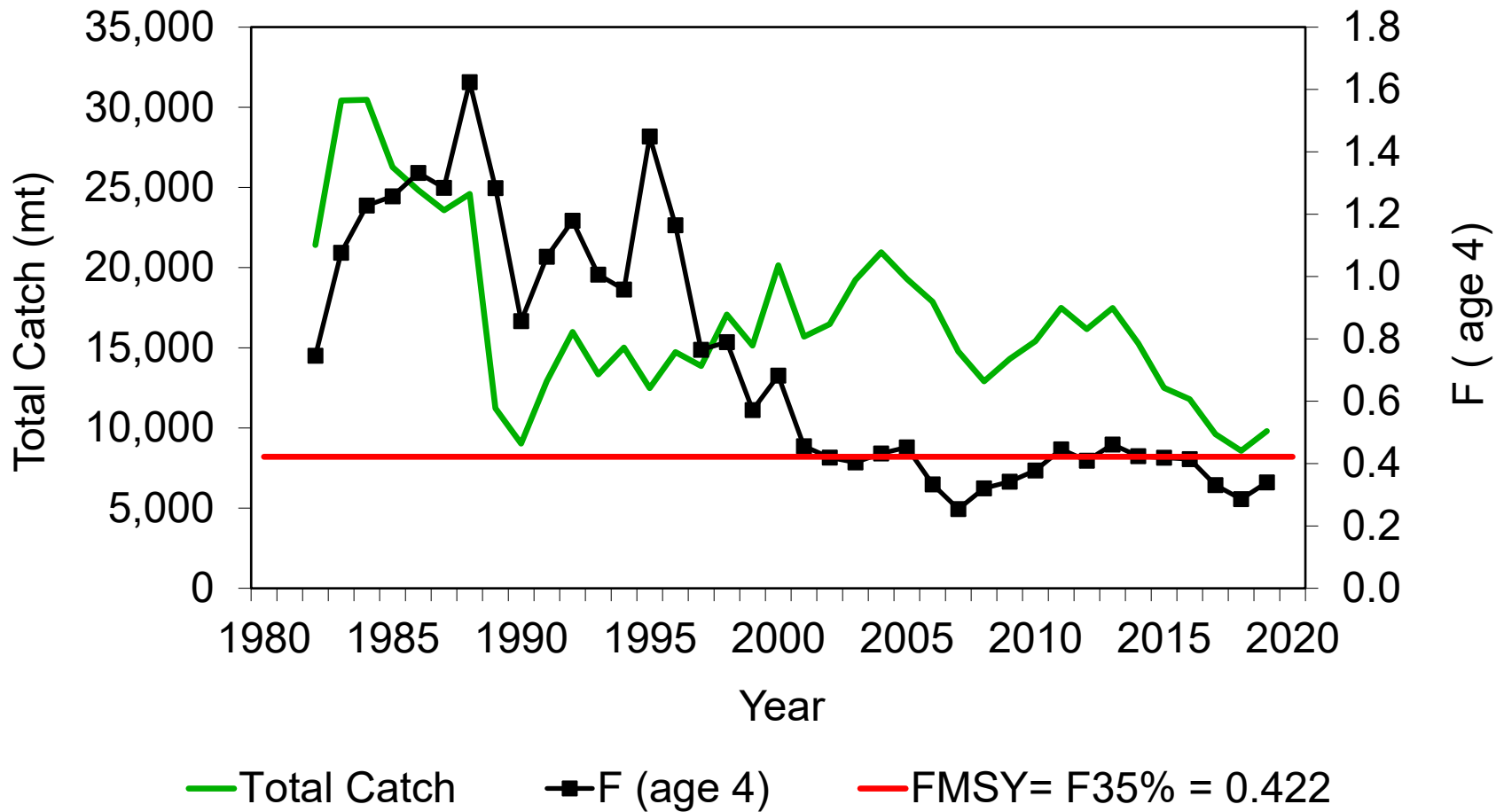
- Overfishing not occurring in 2019
- 2019 $F = 0.340$, 81% of F_{MSY} proxy = 0.422

Fishing Mortality

2021 MTA



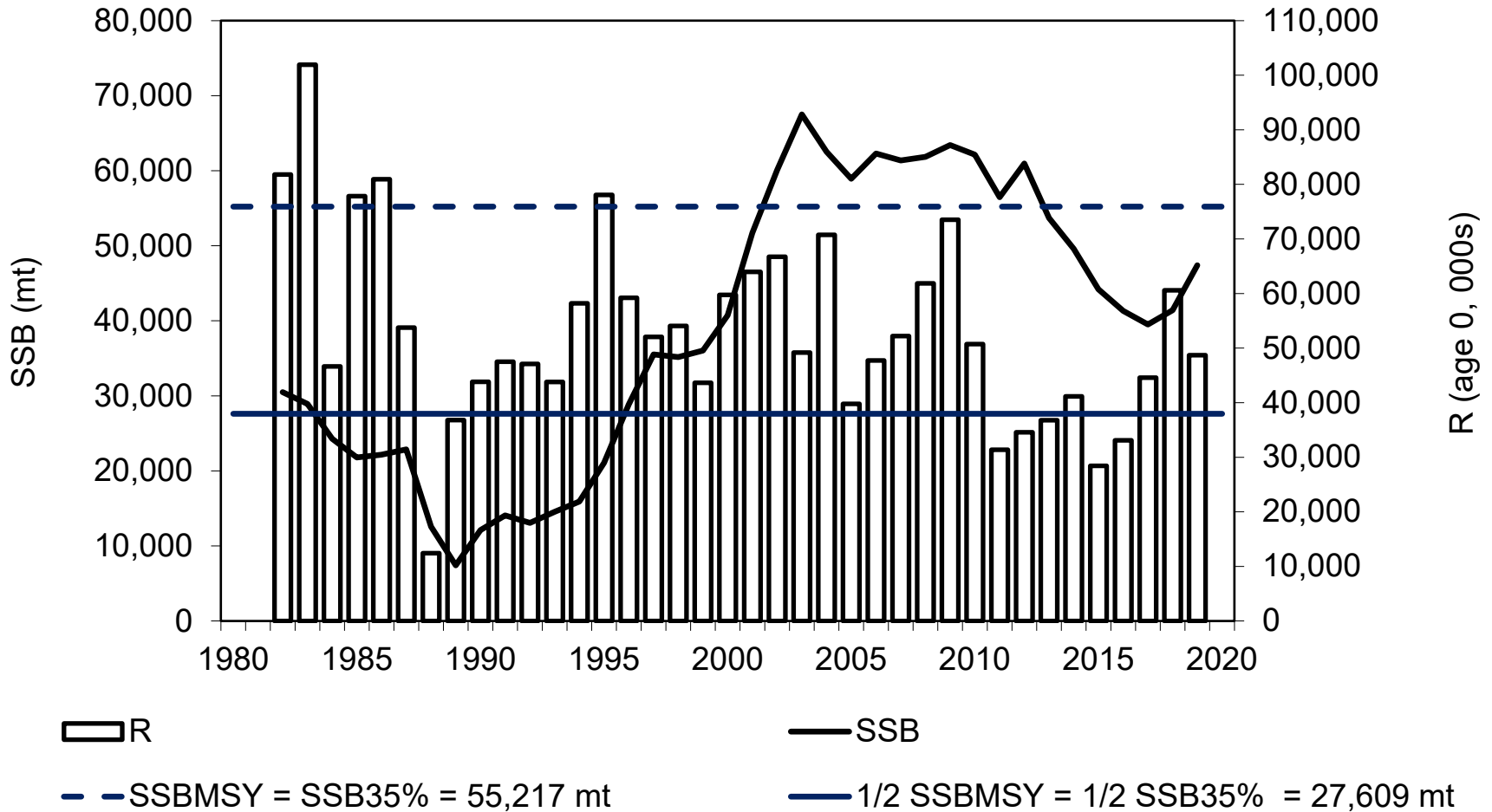
Total Catch and Fishing Mortality (F)



SSB and Recruitment 2021 MTA



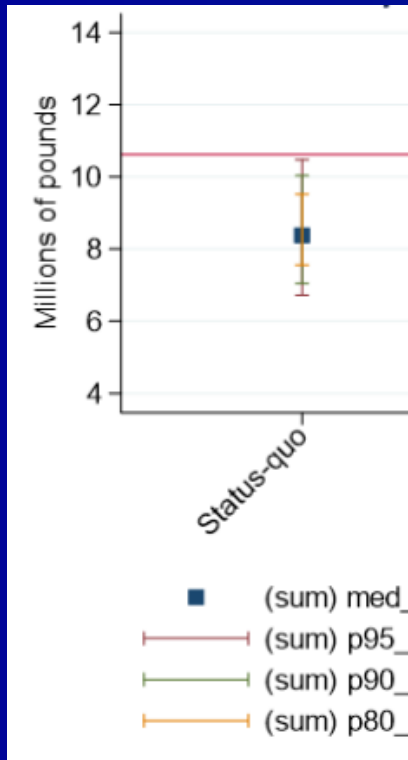
Spawning Stock Biomass (SSB) and Recruitment (R)



Comparison to 2023 RHL



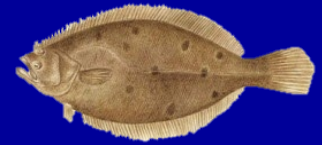
- All calculated CIs (95%, 90%, 80%) for expected 2023 harvest using RDM are **below the 2023 RHL** (→ expected harvest underage)
- CIs for RFDM all **encompass the 2023 RHL** (not considered in staff rec given likely overprediction by RFDM)



	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

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.

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%

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.

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

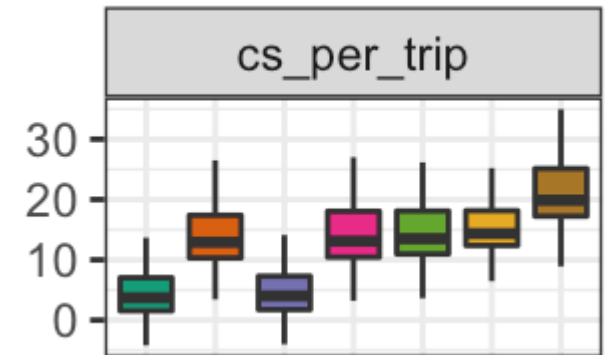
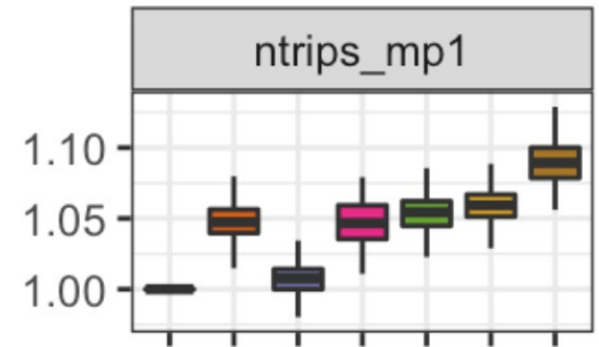
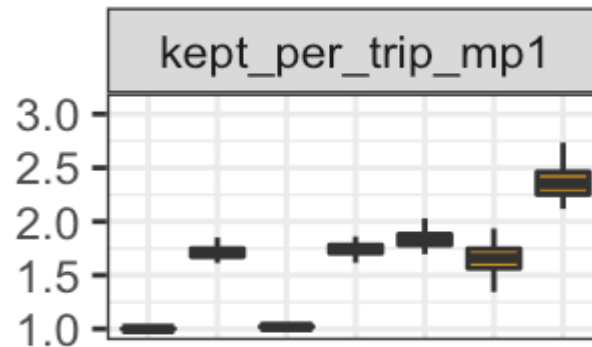
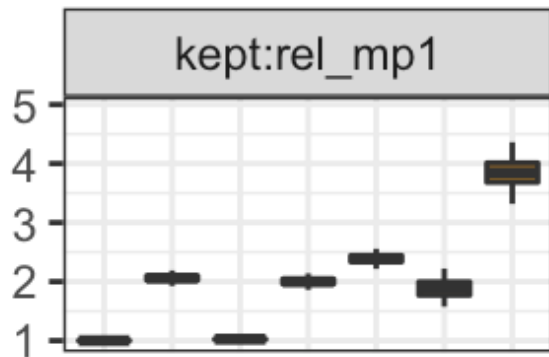
Measures	Harvest Est.	95% CI	90% CI	80% CI	2023 Harvest Target
MP #2 (Status quo regions, modified size)	10.86	8.72-13.42	9.14-12.67	9.69-11.98	9.21
MP#7 (Modified Slot)	10.31	8.53-12.11	8.86-11.53	9.31-11.53	

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

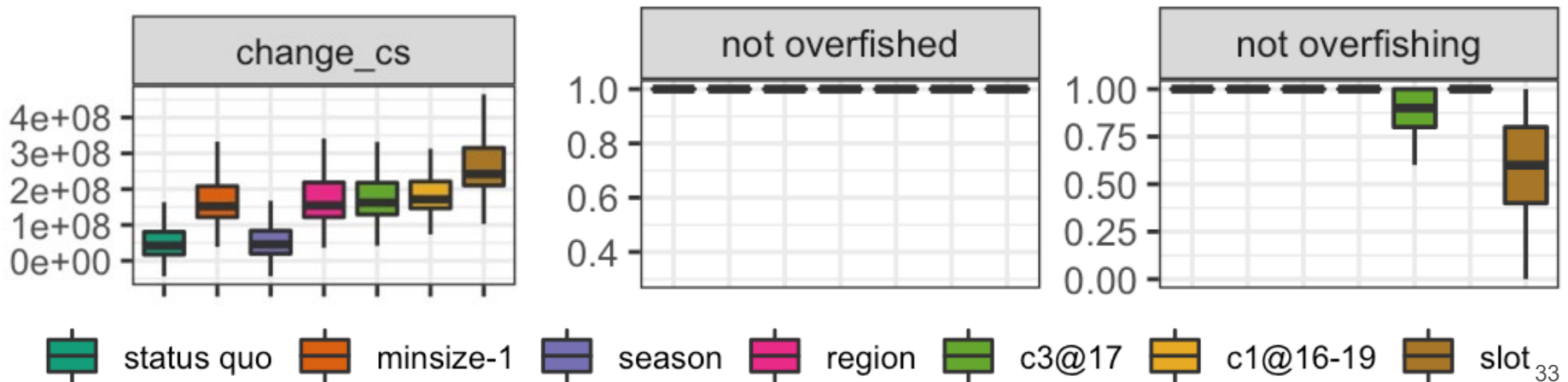


Legend for management scenarios:

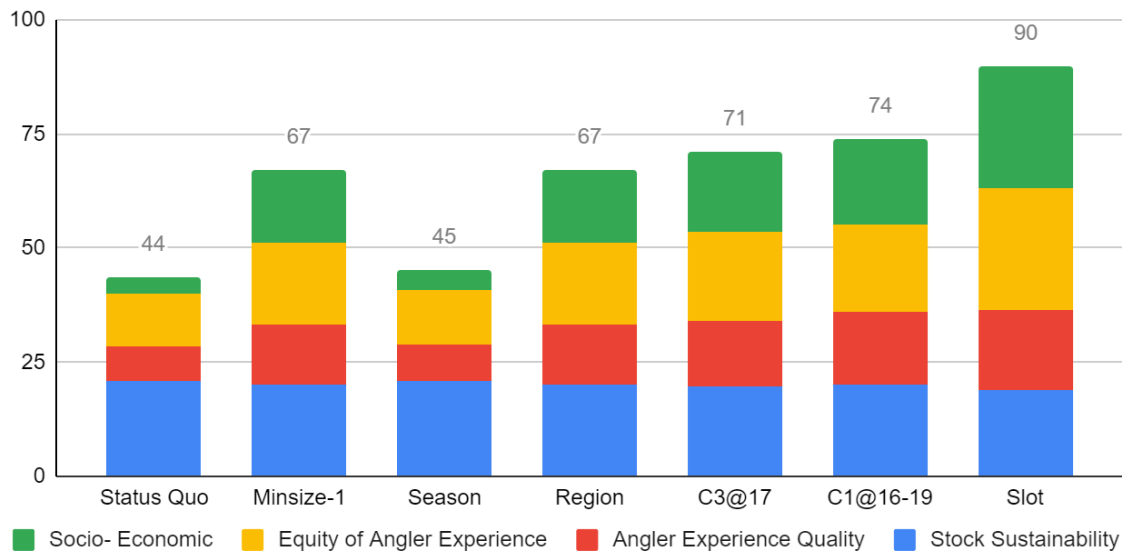
- status quo (green)
- minsize-1 (orange)
- season (purple)
- region (pink)
- c3@17 (light green)
- c1@16-19 (yellow)
- slot₃₂ (brown)

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