Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: **Striped Bass Management Board**

FROM: **Striped Bass Technical Committee and the Stock Assessment Subcommittee**

DATE: **October 16, 2024**

SUBJECT: **Discussion on 2024 Stock Assessment Projections and Considerations for Management**

The Striped Bass Technical Committee (TC) and Stock Assessment Subcommittee (SAS) met via webinar on October 2, 2024 to review the 2024 Stock Assessment Update Report, discuss the projection scenarios, and discuss options and considerations for potential management response. This memorandum summarizes TC-SAS discussion on the likelihood of the different projection scenarios and considerations for management.

The Assessment Report (in Main Materials for the 2024 Annual Meeting) highlights several sources of uncertainty for the rebuilding trajectory, including 2024 removals and fishing mortality rates for 2025-2029.

2024 Removals

Projections were run for two scenarios of 2024 removals: high and low. The 2024 high removals scenario is 5.86 million fish based on the initial estimate using data through 2022 that Addendum II measures would achieve a 13.7% reduction relative to 2022 removals of 6.8 million fish. The 2024 low removals scenario is 3.89 million fish based on expanding preliminary 2024 MRIP catch estimates for Waves 2 and 3 (March-April and May-June) to the full year, based on the proportion of total removals that occurred in those Waves in earlier years, and accounting for an estimated 7% decrease in commercial removals due to the Addendum II quota reduction.

The TC-SAS considers the 2024 low removals scenario based on preliminary 2024 MRIP numbers to be more likely than the high removals scenario based on the initial Addendum II calculations. The low removals scenario is based on realized data through mid-2024, while the high removals scenario was projected before any 2024 data were available. While the high removals projection was the best information available prior to the 2024 season, realized catch estimates provide a better picture of what is happening in the fishery. Additionally, it is logical that catch would decrease in 2024 relative to 2023 (instead of increasing, as in the high removals scenario) since the age-9 2015 year-class is less available to the ocean slot limit in 2024 as compared to 2023. Preliminary MRIP numbers for 2024 Waves 2 and 3 are 36% lower than 2023 Waves 2 and 3 numbers (Figure 1), and in the previous five years, the proportion of total recreational removals from Waves 2 and 3 has been relatively consistent (Figure 2). Total

removals in Waves 4-6 would have to increase significantly compared to what has been observed in the past to achieve the high removals estimate.

Fishing Mortality for 2025-2029

The Assessment Report presents five projection scenarios through 2029 resulting in varying probabilities of rebuilding the stock by the 2029 deadline (Figures 3-4). One scenario assumes high removals in 2024 and maintaining that constant fishing mortality (*F*) in 2025-2029. The TC-SAS considered the high 2024 removals scenario unlikely and used the low 2024 removals assumption for the rest of the scenarios. These four scenarios use the estimate of *F* in 2024 associated with the low 2024 removals scenario with varying assumptions for *F* in 2025-2029. The varying assumptions for *F* in 2025-2029 are intended to address the uncertainty of the effect of the above-average 2018 year-class entering the ocean fishery in 2025 and subsequently growing out of the ocean slot in the following years. All five scenarios are described below with input from the TC on which may be more likely than others.

Constant *F* at $F=F_{2024}$ for Low 2024 Removals: this scenario assumes *F* in 2025-2029 will be equal to the *F* in 2024 estimated under the low removals scenario. This is the best case scenario for the stock out of the scenarios considered; however, the TC-SAS considered it unlikely that *F* would remain constant from 2024 to 2025 with the 2018 year-class entering the ocean fishery. In this scenario, there is a 50% probability of rebuilding by 2029, but a 4% reduction in removals relative to 2024 would be needed to maintain *F* at F_{2024} in 2025.

F_{2024}=Low Removals, *F* Increases in 2025 Only and Returns to 2024 Low Levels: this scenario assumes the low removals scenario in 2024, a moderate increase in *F* in 2025, and a decrease and stabilization for *F* in 2026-2029 back to F_{2024}. The TC-SAS considers this scenario most likely relative to the other scenarios. The increase in F_{2025} corresponds to the above-average 2018 year-class entering the current ocean slot limit. The subsequent decrease of *F* in 2026 and stabilization through 2029 corresponds to the 2018 year-class growing out of the current ocean slot limit and the lack of strong year-classes behind it. The moderate increase in F_{2025} (+17%) is the same magnitude as the increase from 2021 to 2023 when part of the 2015 year-class was still in the newly reduced ocean slot limit, but this may be overestimating the magnitude of increase in 2025 since the 2018 year-class is not as strong as the 2015 year-class was. In this scenario, there is a 43% probability of rebuilding by 2029.

F_{2024}=Low Removals and Moderate Increase to Constant *F* for 2025-2029: this scenario assumes the low removals scenario in 2024 followed by a moderate increase in *F* in 2025, comparable to what was observed from 2021 to 2023 with the 2015 year-class, and *F* remaining constant at that increased rate for 2025-2029. The moderate increase in F_{2025} (+17%) is the same magnitude as the increase from 2021 to 2023 when the 2015 year-class was in the newly reduced ocean slot limit. This may be overestimating the magnitude of increase in 2025 since the 2018 year-class is not as strong as the 2015 year-class was. The TC-SAS considers it unlikely that *F* would remain at this elevated level from 2026 to 2029 because at some point, *F* would be expected to decrease as the 2018 year-class grows out

of the current ocean slot. However, it is possible *F* could remain elevated due to decreasing stock abundance (i.e., lower removals but from a smaller population). In this scenario, there is a 19% probability of rebuilding by 2029.

F_{2024}=Low Removals and Large Increase to Constant *F* for 2025-2029: this scenario assumes the low removals scenario in 2024 followed by a large increase in *F* in 2025, comparable to what was observed from 2021 to 2022 with the 2015 year-class, and *F* remaining constant at that increased rate for 2025-2029. The large increase in *F* in 2025 (+39%) used in this scenario is the same magnitude as the increase from 2021 to 2022 when the 2015 year-class was in the previous Addendum VI ocean slot limit. This large increase is likely an overestimate of the magnitude of increase since the 2018 year-class is not as strong as the 2015 year-class was, and the 2022 slot limit was four inches wider than the current slot limit. The TC-SAS considers it unlikely that *F* would remain constant at this elevated level from 2026 to 2029 because at some point, *F* would be expected to decrease as the 2018 year-class grows out of the current ocean slot. In this scenario, there is a 3% probability of rebuilding by 2029.

Constant *F* with $F=F_{2024}$ for High 2024 Removals: this scenario assumes *F* in 2025-2029 is equal to the F_{2024} estimated under the high removals scenario. This is the worst case scenario and the TC-SAS considers the high 2024 removals scenario unlikely compared to the low 2024 removals scenarios. In addition, the TC-SAS considers it unlikely that *F* would remain constant at this high level from 2024 to 2029 with the 2018 year-class entering and then leaving the ocean slot limit. In this scenario, there is a 0% probability of rebuilding to the SSB target by 2029, although there is a 35% probability that SSB will be above the SSB threshold.

Considering Uncertainty in the Range of Projections

These projection scenarios convey a range of different potential outcomes under different assumptions about fishing mortality rates in the near future, some of which are more pessimistic than others. Although some projections aim to capture some component of changing effort and fish availability (i.e., increased *F* when strong year-classes are available), angler behavior and fish availability are still sources of uncertainty. While the TC-SAS considers the scenario where *F* increases in 2025 and then decreases to be the most likely, there is high uncertainty in the exact *F* values that will occur over this period even with constant regulations. In order to have a 50% or greater probability of rebuilding in this scenario, *F* will have to decline below the *F* estimated for 2024, which is already the lowest value since 1994, which may be the result of both the extremely narrow slot limit and the lack of a strong year class in that slot. The low year-classes following the 2018 year-class will result in lower availability of harvestable fish after 2025, which may result in a decline in effort and a lower *F*; however, if removals remain constant on these weaker year-classes, *F* may not decrease as much as expected.

The projections apply the 2024 selectivity curve to all years 2024-2029. The 2024 selectivity curve was developed using an alternative method to better capture the regulation change in 2024, but how well it represents actual fishery selectivity is uncertain. Additional years of data

under the same management regulations would inform a better estimate of selectivity for upcoming assessments.

Potential Management Options

The TC-SAS calculated estimated reductions in total removals associated with a range of recreational size limit changes for 2025 and various recreational harvest closure options. Pending further guidance from the Board on what type of management response and level of reduction (if any) the Board may consider for 2025, a range of options is included for reference. Additional options could be analyzed after the Board determines next steps for management.

When considering possible management response for 2025 and beyond, the Board should consider its risk tolerance. The level of risk the Board is willing to accept is a management decision. In the coming months, the TC could provide updated projections incorporating realized 2024 removals once 2024 MRIP data are available in addition to other management options, if requested by the Board.

For size limit analysis, the TC-SAS used MRIP length frequency data from 2018 and 2011 for the ocean and Chesapeake Bay, respectively, to represent fish availability in 2025 when the above-average 2018 year-class will be age-7. 2018 data were used for the ocean since the 2011 year-class was age-7 that year. Additionally, there was no slot limit in place in 2018, so the length frequency data includes legal harvest of fish above 35", which allows for analysis of slot limits or minimum sizes higher than the current regulations. However, because catch of fish shorter than the minimum length in 2018 was not legal in most areas of the ocean fishery, the 2018 length frequency data does not provide the data necessary to analyze slot limits lower with a minimum lower than the current regulation. Therefore, no reductions for slots of smaller fish are presented for the ocean. 2011 data were used for the Chesapeake Bay since there was not a prominent, strong year class available in the Bay fishery at that time, which will be the case in 2025. Estimated reductions for a range of size limits are presented for each region in Table 1.

For harvest closure analysis, 2021-2022 MRIP data were pooled to capture recent years under the slot limit, including Chesapeake Bay closures that were implemented through Addendum VI. A constant daily harvest rate was calculated by Wave for each state and some combinations of states in each region to estimate reductions from various seasonal harvest closures (Table 2).

The TC-SAS discussed tradeoffs of changing the size limit to allow harvest of larger fish in the ocean vs. maintaining the current slot limit targeting smaller fish. If ocean harvest remains in the current 28-31" slot, the remaining larger 2015s will be protected but the incoming 2018 year-class will be subject to harvest. If harvest is shifted to larger fish, the incoming 2018s would be protected but the larger 2015s would then be subject to harvest, the very fish recent measures were designed to protect. The TC-SAS also discussed the idea of an ocean size limit below 28", which has been the minimum size in the ocean since the stock was rebuilt. Targeting fish smaller than 28" could shift harvest away from both the 2015 and the 2018 year-classes and may be desirable by some stakeholders from a management perspective, but harvest of immature fish would increase, resulting in a loss of spawning potential for the stock. It is

unclear whether the biological benefit of reducing harvest of the remaining 2015s and 2018s would outweigh the biological risk of targeting immature fish. To calculate an estimated reduction for any size limit under 28" for the ocean, the TC-SAS would need to pursue alternative data sources (e.g., state logbooks).

The TC-SAS notes that most size limits evaluated, particularly in the ocean, are estimated to achieve less than a 6% reduction. The TC didn't believe that a regulation change designed to achieve such a reduction would be meaningful. That is, given the typical sources of uncertainty in these analyses, such a low estimated level of reduction would likely not result in a meaningful change in removals if implemented[1]. While a size limit change could be combined with a seasonal closure for a higher estimated cumulative reduction, the benefit of changing to a size limit with such a small estimated reduction may be limited.

Finally, regarding how a potential reduction should be allocated between sectors, the Board was interested in a range of options to split the reduction, and those are provided in Table 3.

[1] For example, a credible range of recreational removals (95% CI) in 2023 is between 4.18 and 5.76 million fish (or the point estimate ± 16%).

Tables

Table 1. Estimated reduction in total removals for various size limits in 2025 for the ocean and Chesapeake Bay.

Ocean		Chesapeake Bay	
Size Limit	**Estimated Reduction Relative to Current 28-31" Slot**	**Size Limit**	**Estimated Reduction Relative to Current 19-24" Slot**
28-30" slot limit	-4.7%	19-23" slot limit	-4.3%
32-35" slot limit	-1.8%	19-22" slot limit	-14.8%
33-36" slot limit	-3.8%	19-21" slot limit	-26.0%
35" minimum size	0%	20-25" slot limit	-1.6%
38" minimum size	-5.4%	20-24" slot limit	-8.4%
40" minimum size	-5.8%	20-23" slot limit	-12.7%

Table 2. Estimated reduction in total removals for 14-day harvest closures occurring during various Waves for states in the ocean and Chesapeake Bay.

Waves in which Ocean Closure (14 days) Occurs by State	**Estimated Reduction for 14-day Harvest Closure**	**Waves in which Chesapeake Bay Closure Occurs (14 days) by State**	**Estimated Reduction for 14-day Harvest Closure**
Wave 3 All States	-1.8%	Wave 3 MD-VA	-4.4%
Wave 4 All States	-1.7%	Wave 4 MD-VA	-3.9%
Wave 5 All States	-1.6%	Wave 5 MD-VA	-4.2%
Wave 6 All States	-3.1%	Wave 6 MD-VA	-3.8%
Wave4ME-CT; Wave6NY-NC	-4.3%	Wave4MD; Wave3VA	-4.9%
Wave4ME-MA; Wave6RI-NC	-4.1%	Wave4MD; Wave5VA	-4.1%
Wave4ME-MA; Wave3RI-NC	-2.4%	Wave4MD; Wave6VA	-4.5%
Wave4ME-NH; Wave5MA-NJ; Wave6DE-NC	-1.6%	Wave5MD; Wave3VA	-5.0%
		Wave5MD; Wave6VA	-4.6%

Table 3. Potential sector reductions for different sector splits under the best case scenario for 2025 (4% reduction to maintain $F=F_{2024}$ in 2025) and the worst case scenario for 2025 (46% reduction to achieve $F_{rebuild}$ in 2025).

	Even Reductions		**No Commercial Reduction**		**Reductions Based on Sector Contribution to Total Removals**	
Total Reduction	Comm.	Rec.	Comm.	Rec.	Comm.	Rec.
-4%	-4%	-4%	0%	-4.5%	-0.4%	-4.5%
-46%	-46%	-46%	0%	-51.7%	-5.1%	-49.1%

Figures

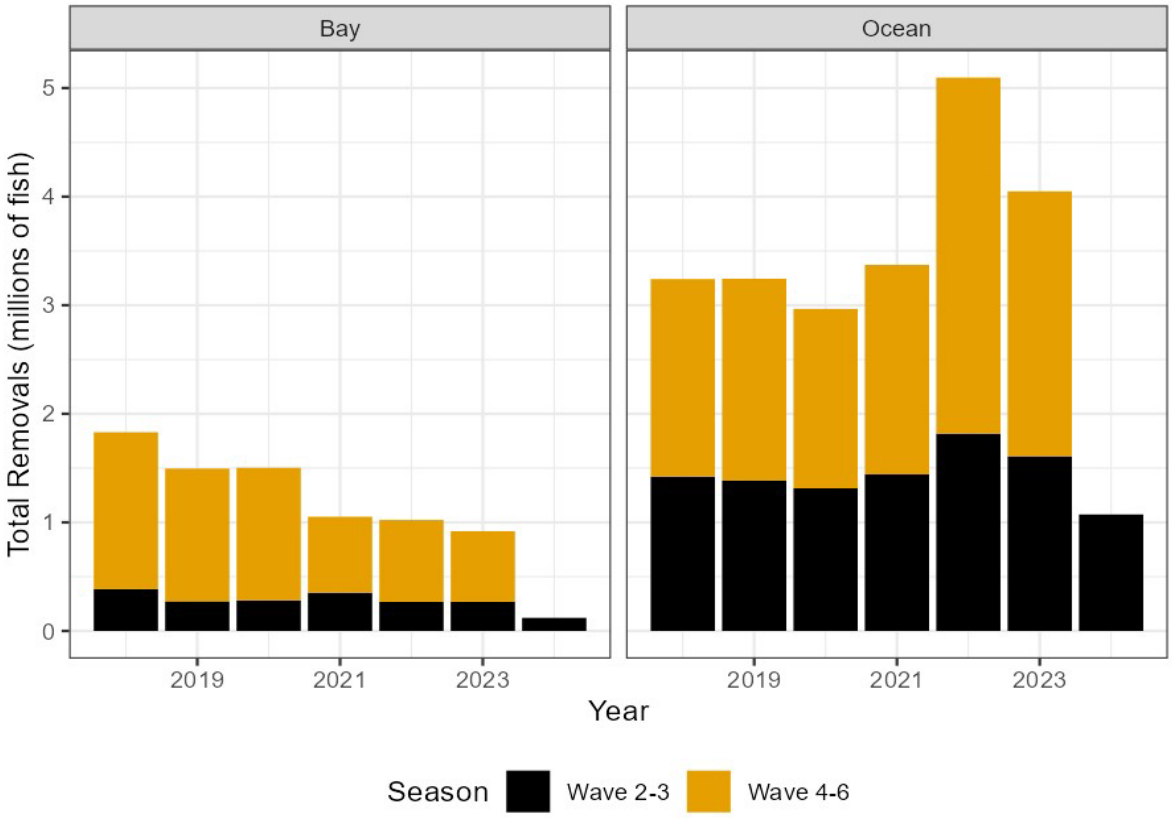

Figure 1. Total recreational removals by region separated into Waves 2-3 and 4-6. Source: MRIP.

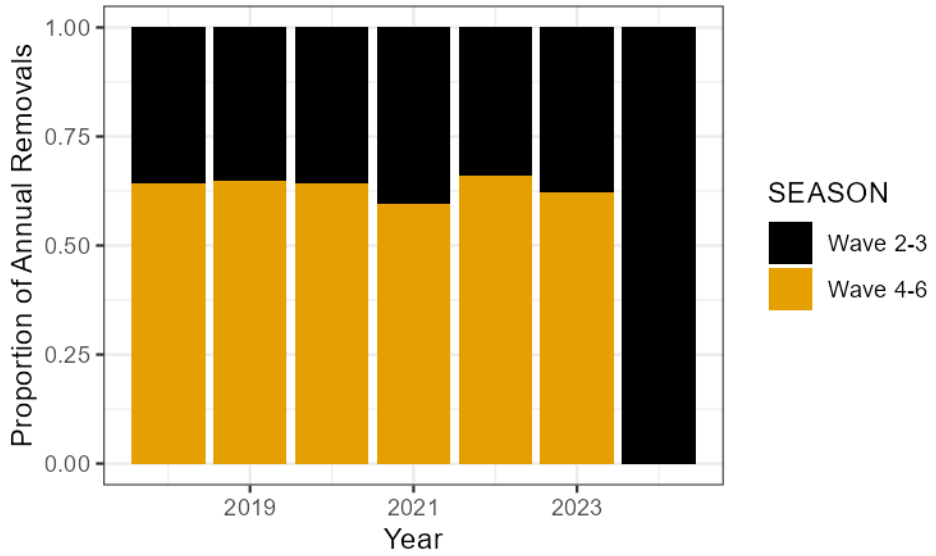

Figure 2. Proportion of total recreational removals for 2018-2024 that came from Waves 2-3 and 4-6. Source: MRIP

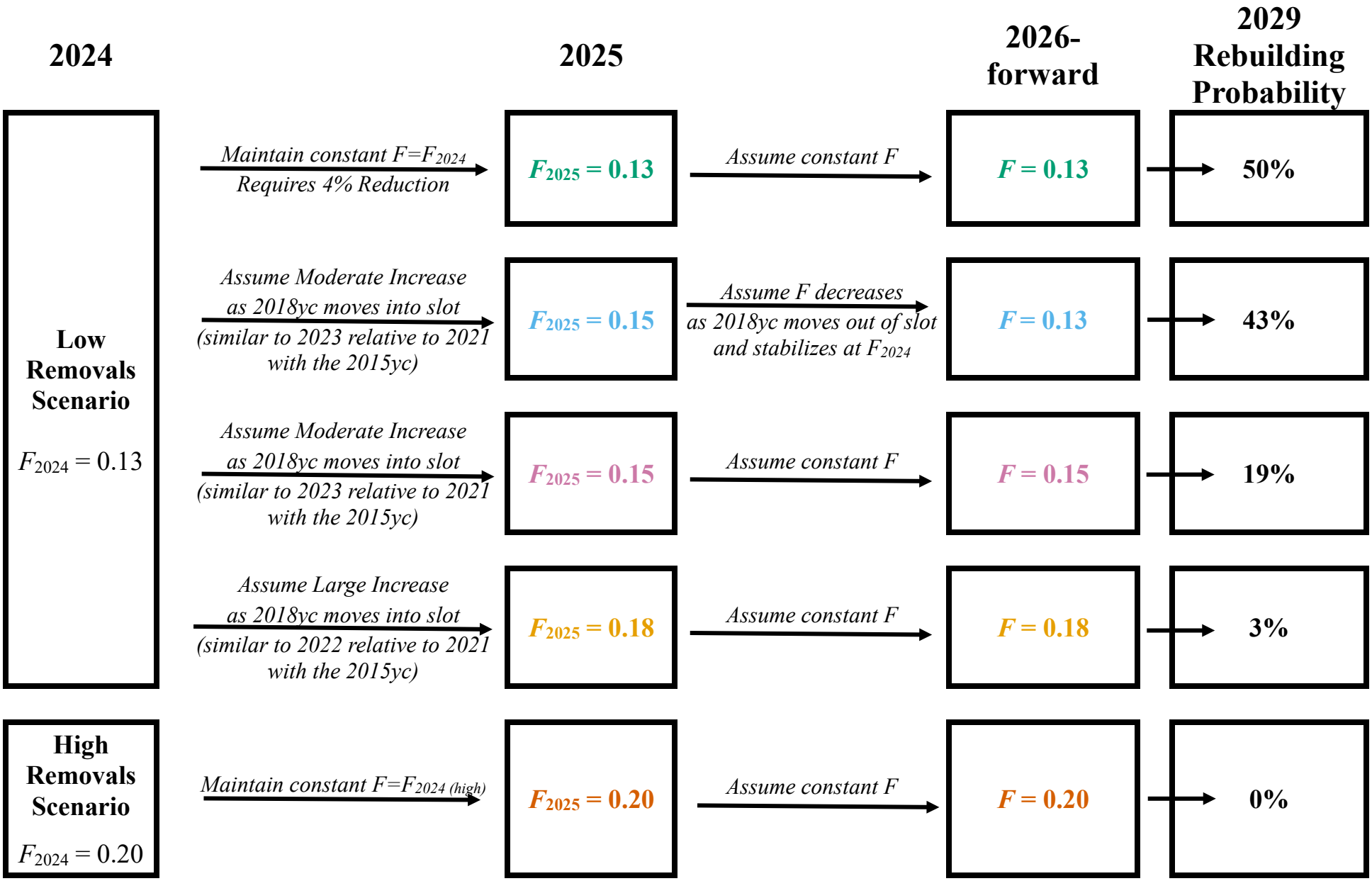

Figure 3. Projection scenarios and resulting probability of rebuilding the stock by 2029.

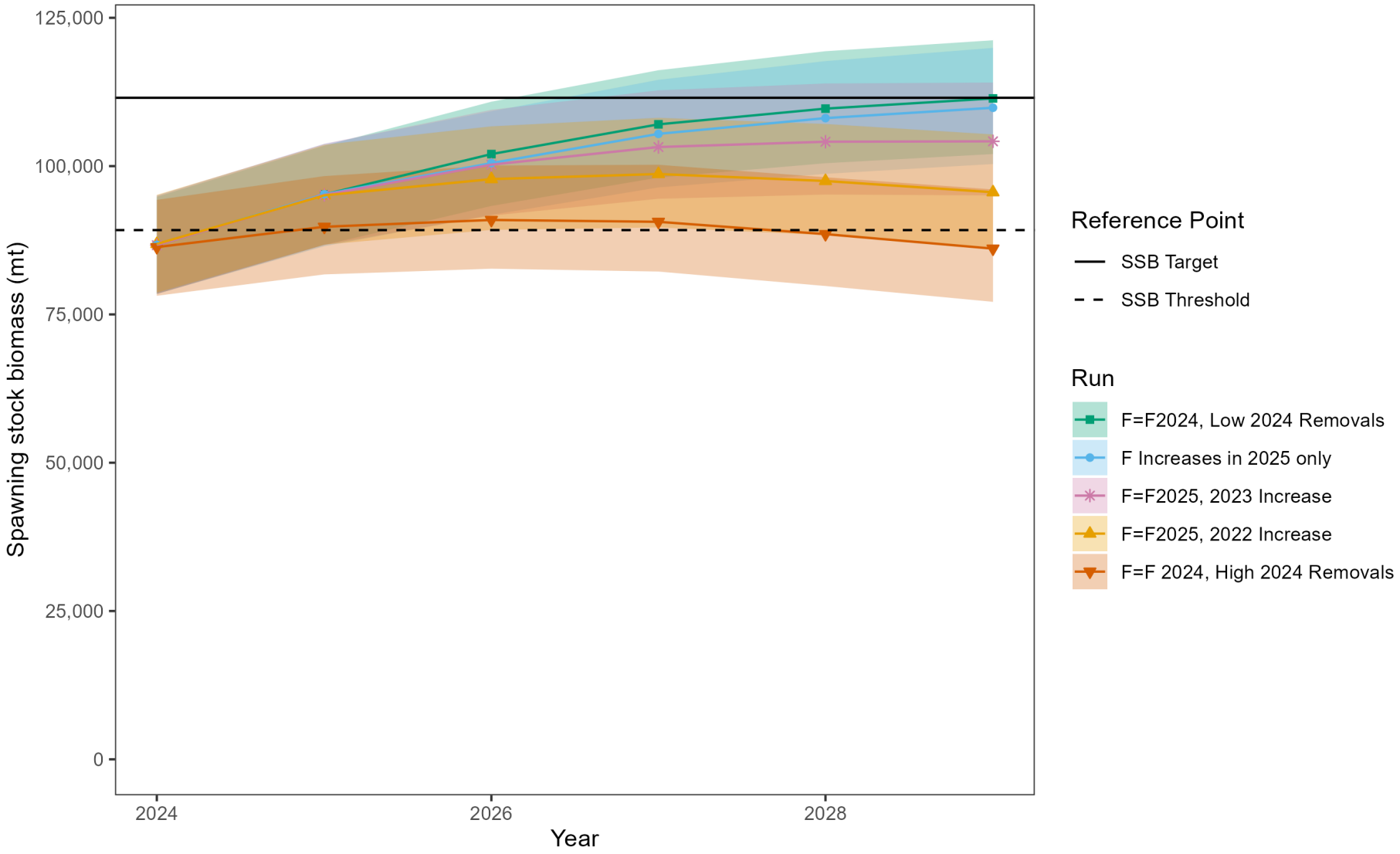

Figure 4. Projections of female spawning stock biomass through 2029 under different future *F* scenarios: assuming *F* stays the same as in 2024 under the low removals scenario (*F=F* 2024), increases in 2025 only and then returns to 2024 levels, increases at a rate comparable to what was observed in 2022 (*F=F* 2025, 2022 Increase) or 2023 (*F=F*2025, 2023 Increase), or assuming *F* stays the same as in 2024 under the high removals scenario (*F=F* 2024, High Removals).