

Addendum

SEDAR 84 Stoplight Parrotfish – St. Croix

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1 Introduction

This addendum provides supplementary analyses developed in direct response to requests made by the SEDAR 84 Review Workshop Panel. The model runs and plots presented here build on the configurations documented in the SEDAR 84 Assessment Process Report for US Caribbean Stoplight Parrotfish in St. Croix, USVI.

The additional model runs conducted during the Review Workshop are intended to document exploratory work that may inform next steps toward refining the assessment framework for consideration by the Caribbean Fishery Management Council's Science and Statistical Committee.

Only the model runs reviewed by the panel during the Review Workshop are included in this addendum. While additional exploratory analyses could be pursued (e.g., steepness values informed by FishBase rather than assuming steepness near 1), these were not examined during the workshop. Future work will integrate further panel recommendations and additional sensitivity analyses once the Review Workshop Report is finalized.

2 Key Considerations

- All model runs included here were developed under the direction of the Review Workshop Panel to explore data use, model behavior.
- The models remain preliminary and sensitive to consequential assumptions (e.g., initial equilibrium catch, recruitment steepness, selectivity). Further work is required to address these uncertainties and develop models more robust for informing management advice.
- These models do not represent final scientific advice. They are intermediate steps in an iterative review process leading to future model development, SSC review, and eventual management consideration.

3 Model Runs

Included is a compilation of the stock assessment model runs developed during the SEDAR 84 Review Workshop held from July 15 to July 18, 2025 in Fort Lauderdale, Florida.

Building on the models documented in the assessment process report for Stoplight Parrotfish in St. Croix, the review workshop introduced several refinements and exploratory runs. The initial review workshop model used a single-sex configuration, applied the Stock Synthesis F method option 2 and corrected standard error units for the NCRMP survey index of abundance. The second model estimated two growth parameters (the growth coefficient K and the mean length at maximum age).

Table 1 summarizes the models described above and figures are provided in Section 6.

For each model, key Spawning Potential Ratio (SPR) plots are provided with horizontal red lines indicating the MSY proxy of 40% SPR. The SPR plot shows the estimated spawning potential ratio over time. Similarly, the unfished ratio plot presents the time series of the fraction of unfished spawning output. Lastly, the fishing intensity plot displays the inverse of the SPR ($1 - \text{SPR}$).

4 Conclusions and Next Steps

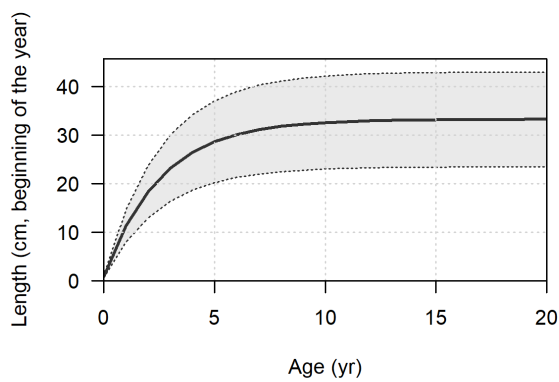
These analyses are exploratory and were conducted under panel direction during the SEDAR 84 Review Workshop. Further work is required to evaluate consequential assumptions, add sensitivity runs (e.g., steepness from FishBase), and ensure models are robust to uncertainty. Final recommendations and additional work steps will be determined following completion of the Review Workshop Report, outside of the SEDAR 84 process.

5 Tables

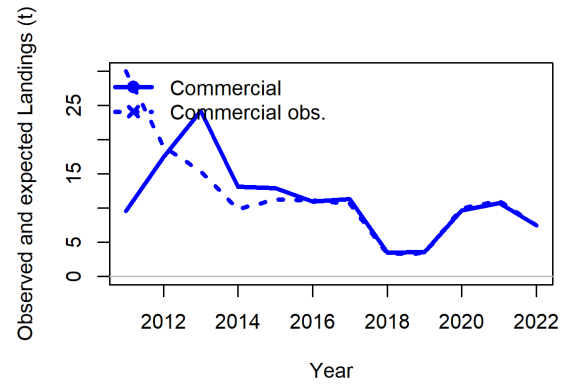
Table 1: Summary of Review Workshop SEDAR 84 models for Yellowtail Snapper in Puerto Rico.

Model	Description
STX_RW_1	Single Sex, F method 2, Catch SE = 0.3, and Corrected Survey SE
STX_RW_2	STX_RW_1 + Catch SE = 2 and Estimated Growth

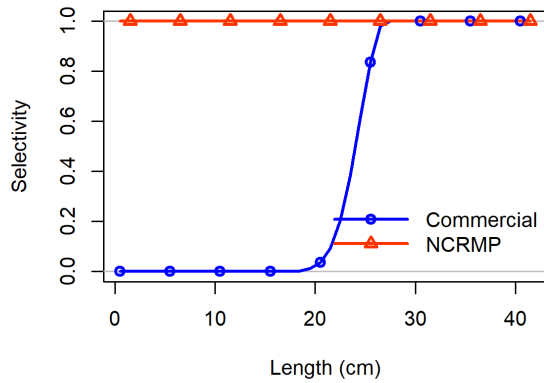
6 Figures



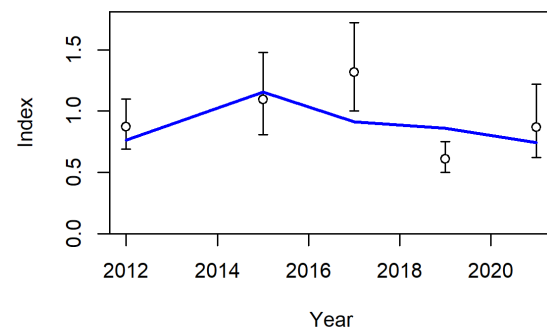
(a) Size at age



(b) Observed and expected landings

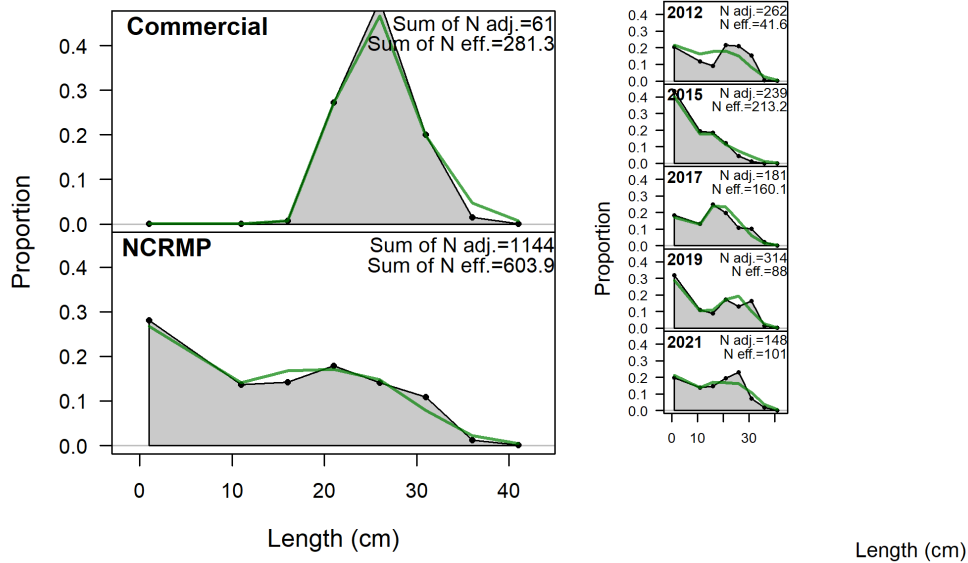


(c) Selectivity



(d) Index NCRMP

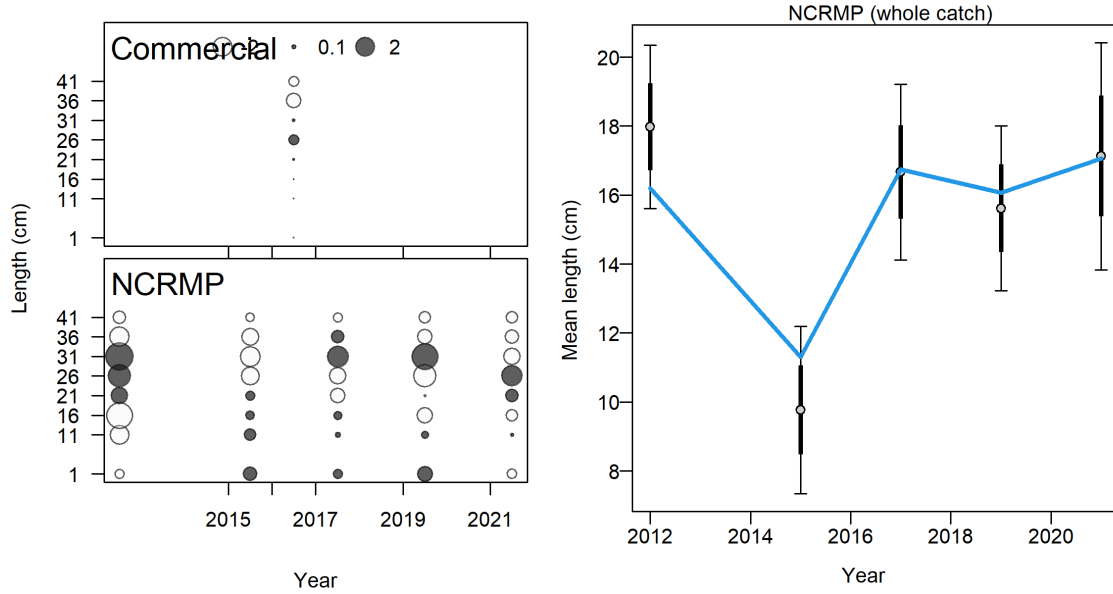
Figure 1: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_1. (a) Length at age in the beginning of the year (or season) in the ending year of the model. Shaded area indicates 95% distribution of length at age around estimated growth curve; (b) observed and expected landings; (c) selectivity at length by fleet; and (d) Fit to index data for the NCRMP survey.



(a) Lenth fit aggregated across time

(b) Length comps NCRMP

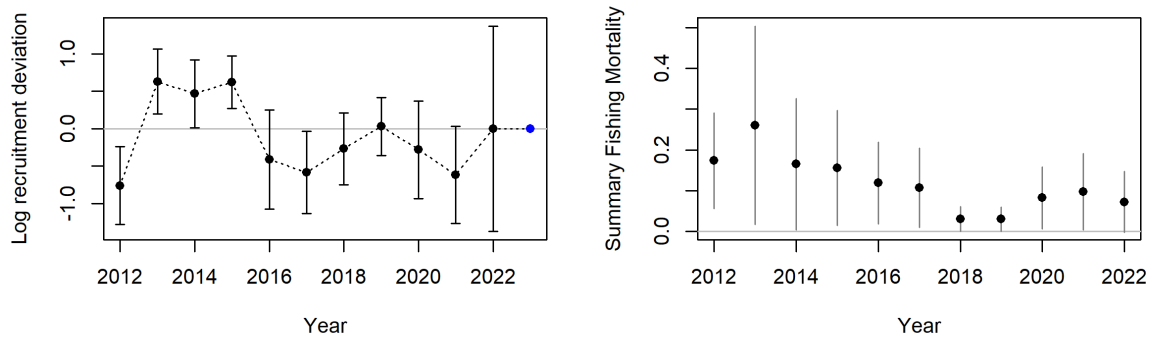
Figure 2: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_1. (a) Observed and predicted length distributions in centimeters, aggregated across time by fleet; and (b) observed and predicted length distributions in centimeters, by year for the NCRMP survey. ‘N adj.’ is the input sample size after data-weighting adjustment. N eff. is the calculated effective sample size used in the McAllister-Ianelli tuning method.



(a) Length fit

(b) Mean length NCRMP

Figure 3: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_1. (a) pearson residuals, comparing across fleets. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected); and (b) mean length for the NCRMP survey with 95% confidence intervals based on current sample sizes.



(a) Recruitment deviations

(b) Fishing Mortality

Figure 4: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_1. (a) Recruitment deviations with 95% intervals; and (b) fishing mortality (total biomass killed / total biomass).

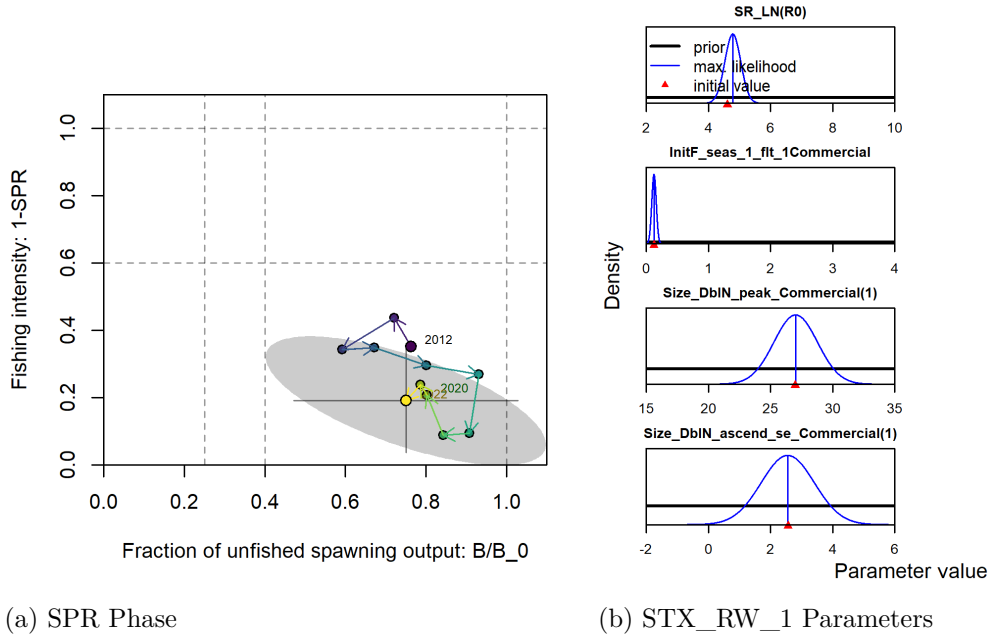
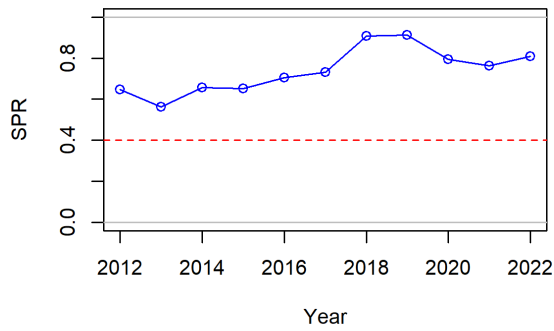
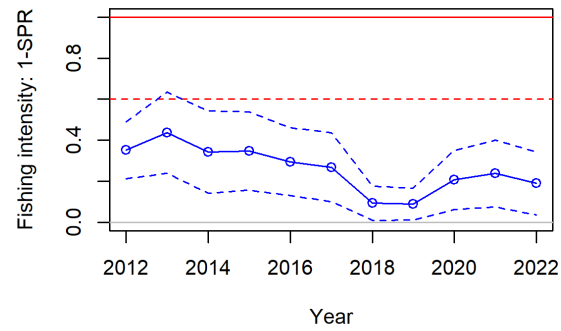


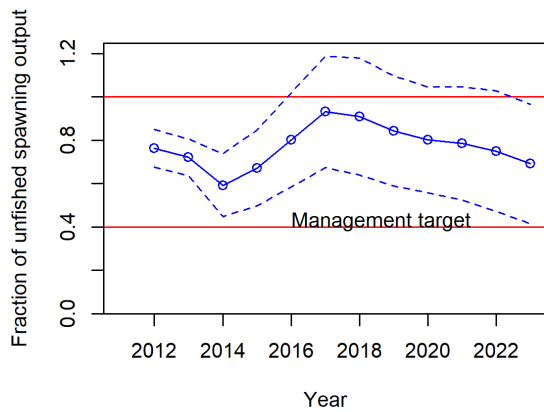
Figure 5: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_1. (a) phase plot of biomass ratio vs. SPR ratio where warmer colors (red) represent early years and colder colors (blue) represent recent years. Lines through the final point show 95% intervals based on the asymptotic uncertainty for each dimension.; and (b) parameter distribution plots.



(a) SPR

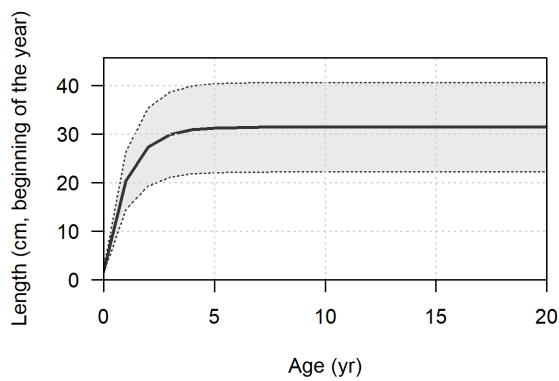


(b) SPR Ratio

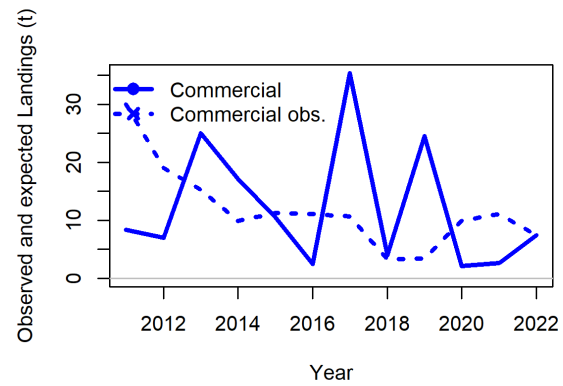


(c) Unfished ratio

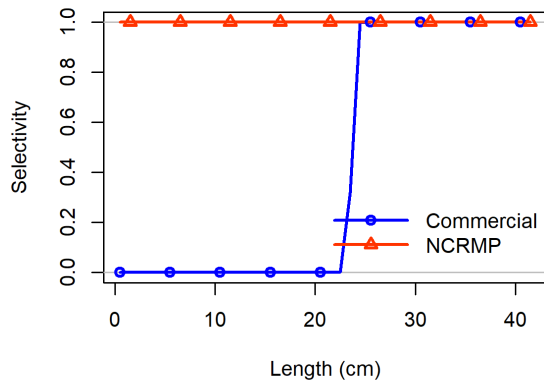
Figure 6: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_1. (a) Time series of 1-SPR. Horizontal line is at 1 - SPR target: $1 - 0.4 = 0.6$; (b) time series of SPR ratio: 1-SPR; and (c) the relative spawning stock biomass (total biomass / virgin spawning stock biomass) with $\sim 95\%$ asymptotic intervals.



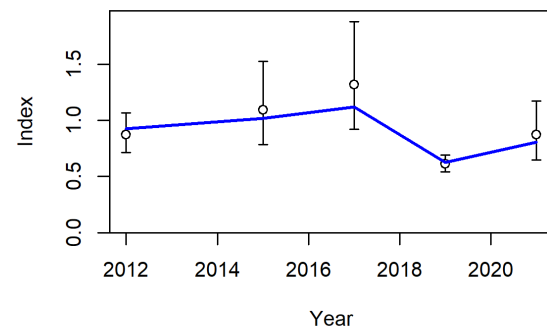
(a) Size at age



(b) Observed and expected landings

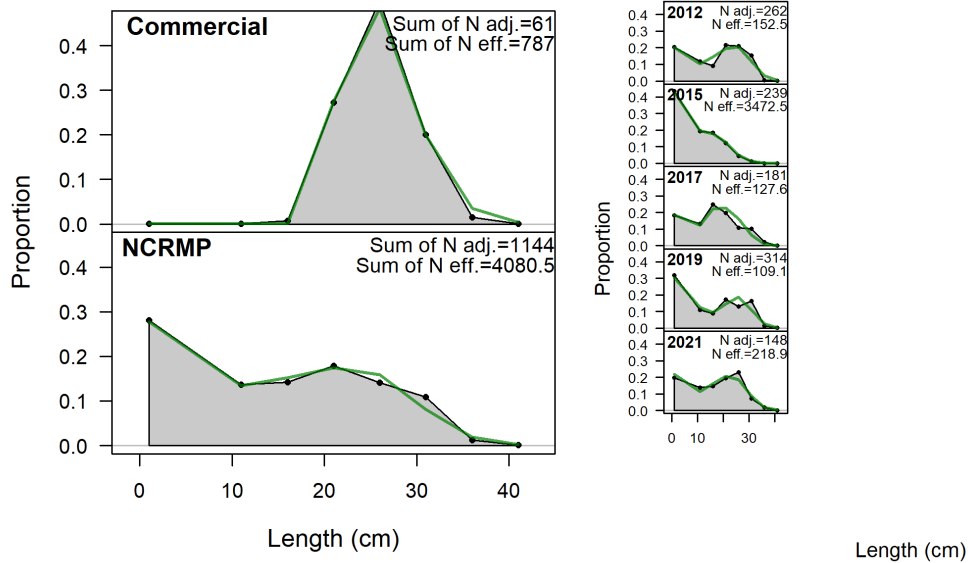


(c) Selectivity



(d) Index NCRMP

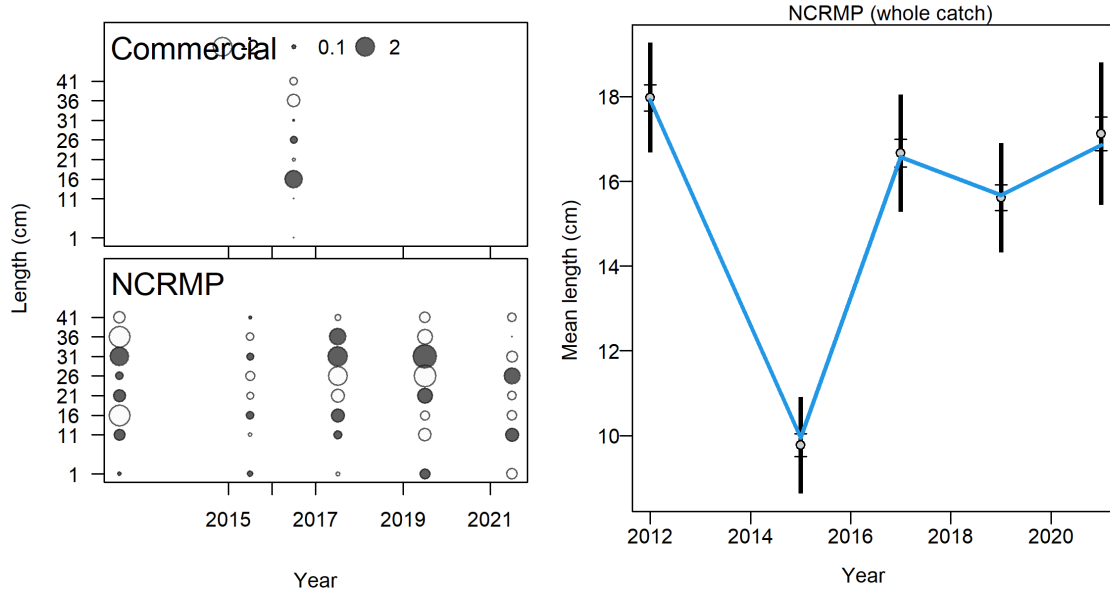
Figure 7: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_2. (a) Length at age in the beginning of the year (or season) in the ending year of the model. Shaded area indicates 95% distribution of length at age around estimated growth curve; (b) observed and expected landings; (c) selectivity at length by fleet; and (d) Fit to index data for the NCRMP survey.



(a) Length fit aggregated across time

(b) Length comps NCRMP

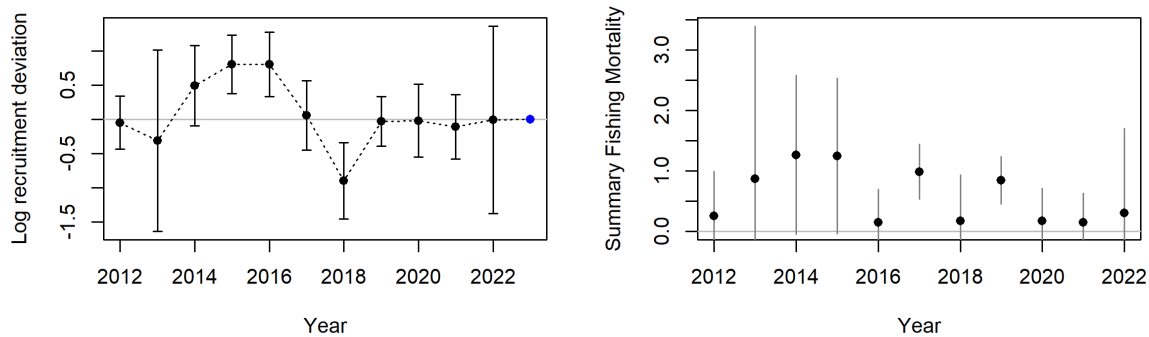
Figure 8: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_2. (a) Observed and predicted length distributions in centimeters, aggregated across time by fleet; and (b) observed and predicted length distributions in centimeters, by year for the NCRMP survey. 'N adj.' is the input sample size after data-weighting adjustment. N eff. is the calculated effective sample size used in the McAllister-Ianelli tuning method.



(a) Length fit

(b) Mean length NCRMP

Figure 9: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_2. (a) pearson residuals, comparing across fleets. Closed bubbles are positive residuals (observed > expected) and open bubbles are negative residuals (observed < expected); and (b) mean length for the NCRMP survey with 95% confidence intervals based on current sample sizes.



(a) Recruitment deviations

(b) Fishing Mortality

Figure 10: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_2. (a) Recruitment deviations with 95% intervals; and (b) fishing mortality (total biomass killed / total biomass).

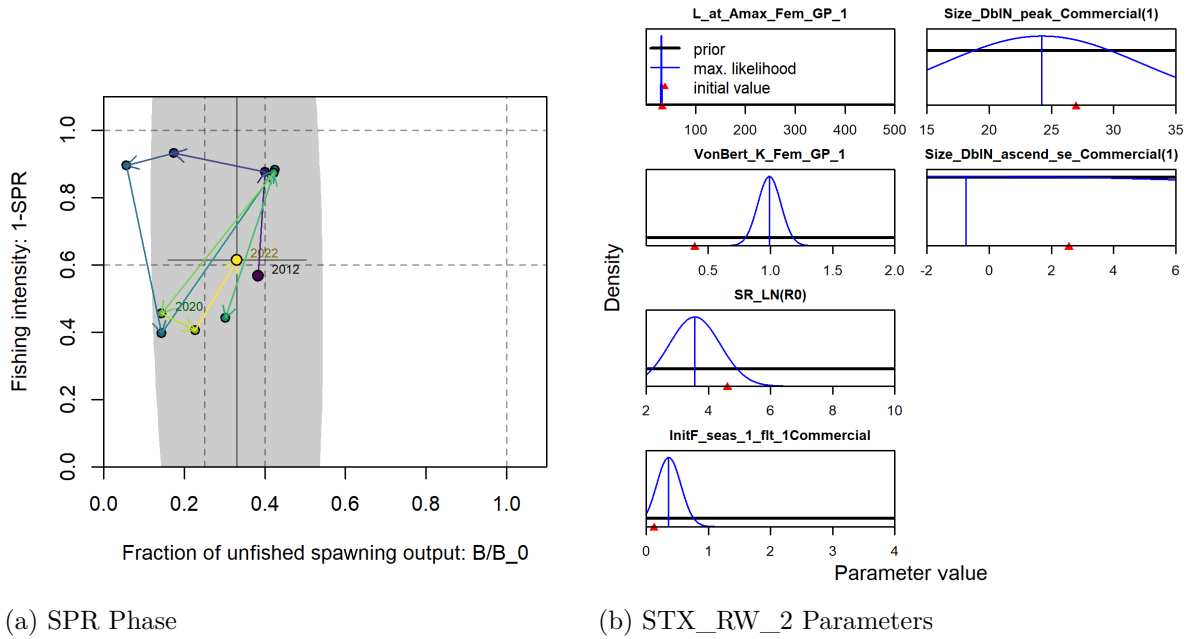
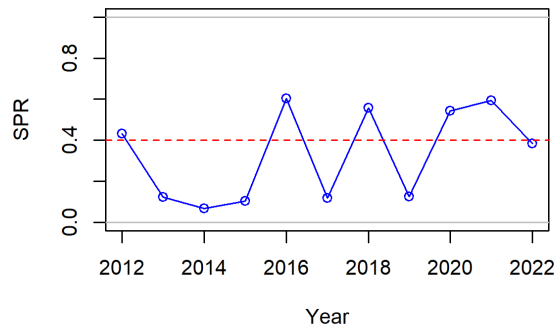
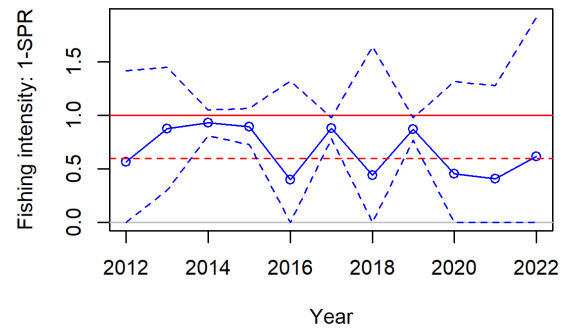


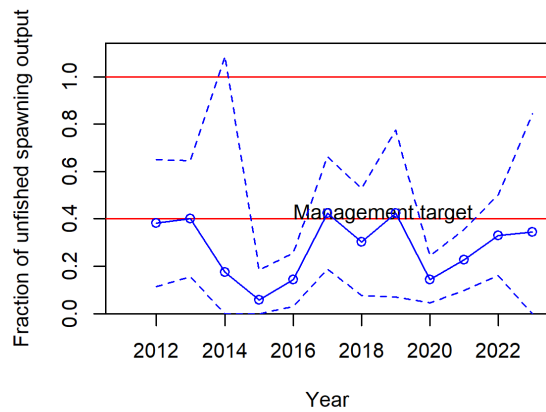
Figure 11: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_2. (a) phase plot of biomass ratio vs. SPR ratio where warmer colors (red) represent early years and colder colors (blue) represent recent years. Lines through the final point show 95% intervals based on the asymptotic uncertainty for each dimension.; and (b) parameter distribution plots.



(a) SPR



(b) SPR Ratio



(c) Unfished ratio

Figure 12: St. Croix Stoplight Parrotfish Review Workshop Model STX_RW_2. (a) Time series of 1-SPR. Horizontal line is at 1 - SPR target: $1 - 0.4 = 0.6$; (b) time series of SPR ratio: 1-SPR; and (c) the relative spawning stock biomass (total biomass / virgin spawning stock biomass) with $\sim 95\%$ asymptotic intervals.