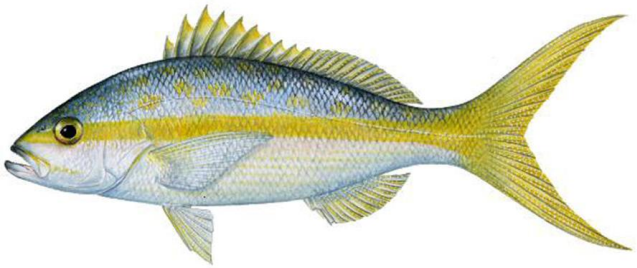


Southeastern US Yellowtail Snapper

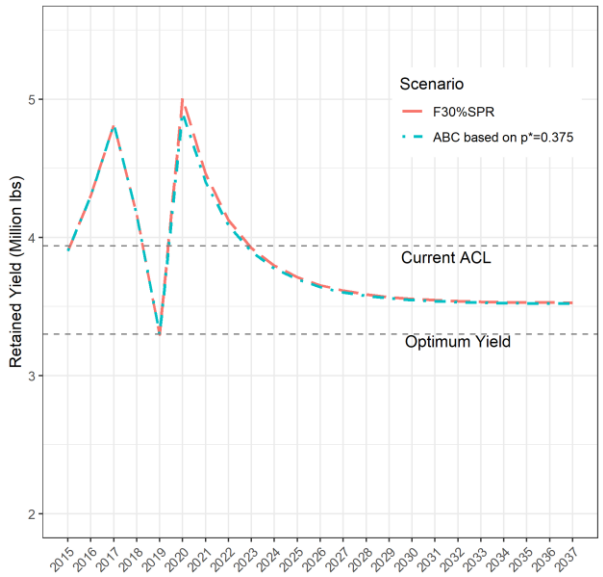
P* Analysis Results

July 2020

Summary

The following projection scenarios were accomplished by using R code provided by the SEFSC (developed by Nathan Vaughan). This code has added benefits of 1) matching the retained landings in both metric tons and numbers in the gap years (2018 and 2019) exactly, 2) scaling annual fishing mortality rate values to match the yield associated with a P* value, and 3) allowing fleet allocations to be specified and kept constant for all years. It is an iterative method that specifies fishing mortality rates for each fleet per year. One caveat is the version of SS used for the SEDAR 64 assessment (3.30.14) has a known issue and will not allow fishing mortality rates to be specified in the forecast file. To that end, the base model was fit in SS version 3.30.13. Model outputs showed negligible differences from those using version 3.30.14. Fleet allocations are not currently specified. The following results maintain the recent average fleet allocations that were estimated in the base model.

The P* scenario is the ABC value associated with the 37.5th quantile of the equilibrium OFL distribution. This normal distribution has a mean of 1,601.11 metric tons (3.53 million lbs) and a standard deviation of 142.37 metric tons (0.32 million lbs). The corresponding ABC is 1,555.7 metric tons (3.43 million lbs) which is 97.2% of the OFL (Figure A1).



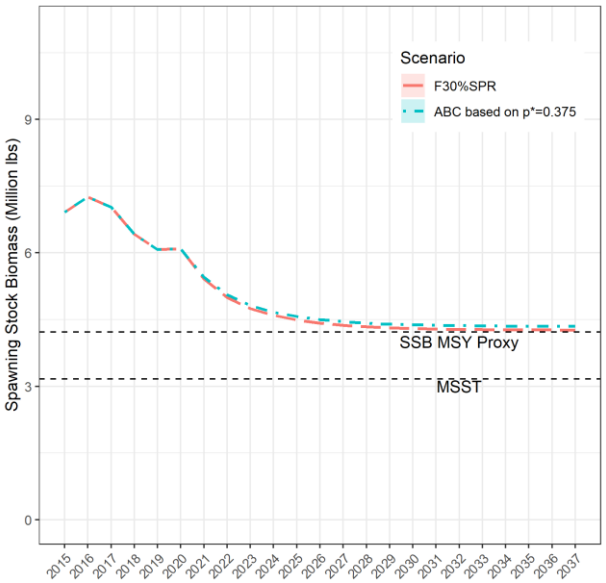


Figure 1: Retained Yield (left panel) and resulting Spawning Stock Biomass (right panel) for projections with fishing at $F_{SPR30\%}$ (red dashed lines), and fishing at a level that corresponds to the ABC value calculated from a P value of 0.375(green dashed lines). Recruitment in the first year for all scenarios is equal to the recent average recruitment (2015-2017), and reference points are marked with horizontal dotted lines.*

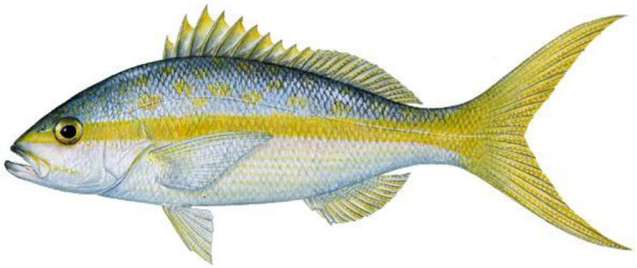


Table 1. Yellowtail Snapper projected landings in millions of pounds under two projection scenarios, from 2018 – 2037.

Year	Retained yield (million lbs) Projection Scenario	
	F30%SPR	P* = 0.375
2018	4.161	4.161
2019	3.296	3.296
2020	5.007	4.903
2021	4.459	4.399
2022	4.124	4.086
2023	3.923	3.897
2024	3.795	3.776
2025	3.711	3.696
2026	3.654	3.641
2027	3.614	3.603
2028	3.587	3.578
2029	3.568	3.559
2030	3.555	3.547
2031	3.545	3.538
2032	3.539	3.532
2033	3.535	3.527
2034	3.531	3.524
2035	3.529	3.522
2036	3.528	3.521
2037	3.527	3.520
Terminal 5-yr avg	3.530	3.523

Table 2. Yellowtail Snapper projected Spawning Stock Biomass in millions of pounds under two projection scenarios, from 2018 – 2037.

Year	SSB (million lbs) Projection Scenario	
	F30%SPR	P* = 0.375
2018	6.416	6.416
2019	6.071	6.071
2020	6.088	6.088
2021	5.413	5.453
2022	4.999	5.060
2023	4.752	4.822
2024	4.595	4.670
2025	4.490	4.569
2026	4.420	4.501
2027	4.371	4.453
2028	4.338	4.421
2029	4.314	4.398
2030	4.298	4.382
2031	4.287	4.371
2032	4.279	4.363
2033	4.273	4.358
2034	4.270	4.354
2035	4.267	4.351
2036	4.265	4.349
2037	4.264	4.348
Terminal 5-yr avg	4.268	4.352

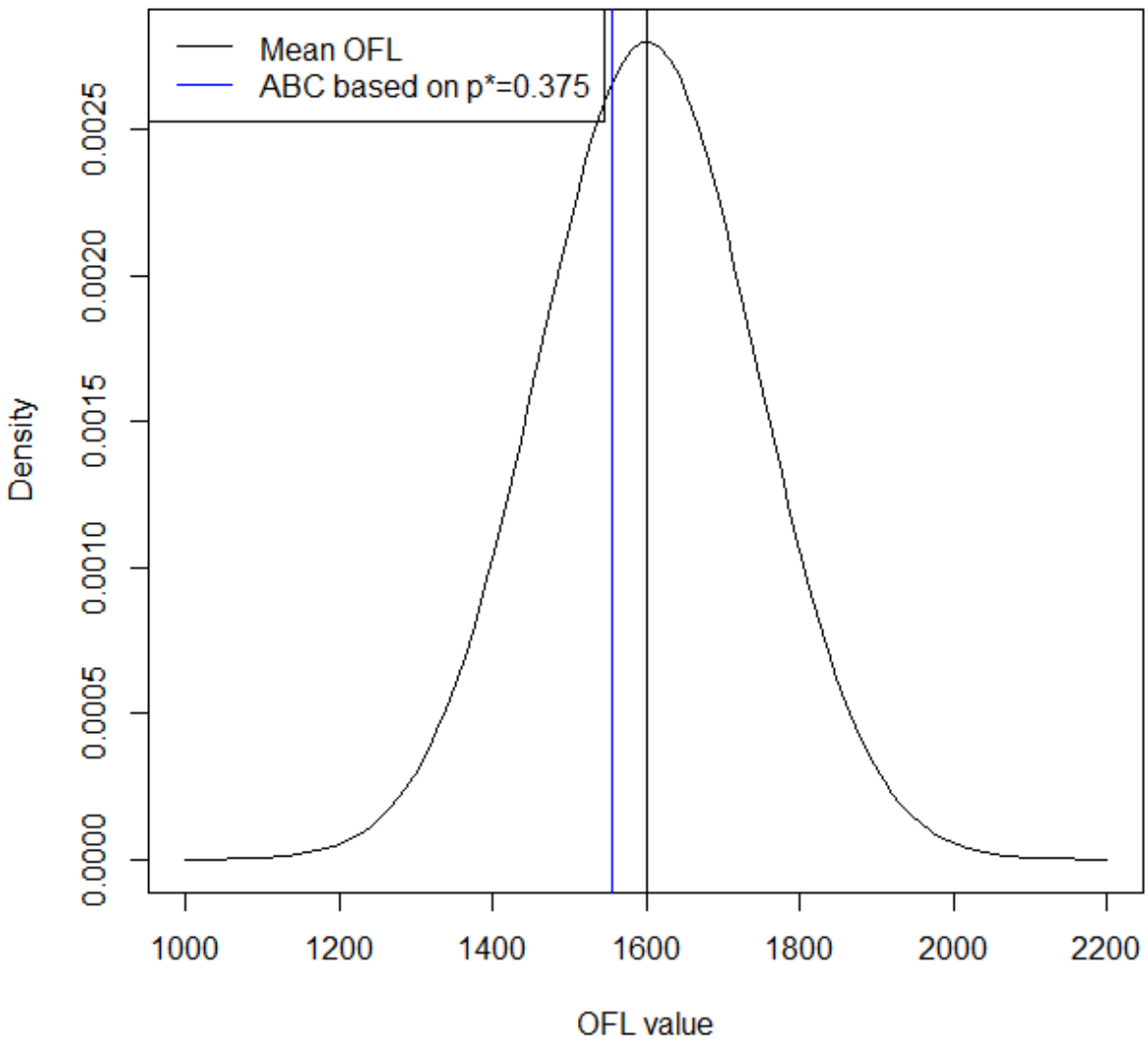



Figure A1. Probability distribution function of the overfishing limit and the corresponding ABC based on a P value of 0.375.*