SEDAR 79: Mutton Snapper

Joint SSC Review - Projections

FWRI Stock Assessment Group, St. Petersburg, FL

February 26, 2025

Projections

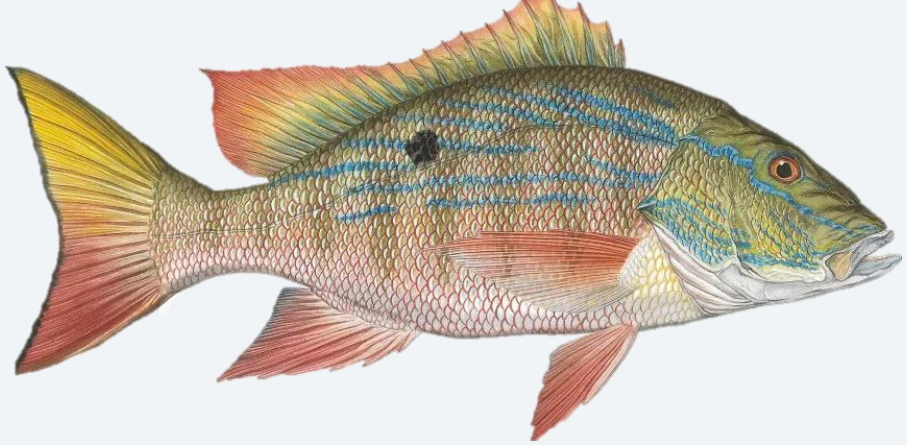
Projection Methods

- Goal: To project SSB and yield (or fishing mortality rates) under a range of harvest scenarios
- Method (developed by SEFSC staff):
  - An iterative process to set fleet-specific Fs each year to ensure that a given constant fishing mortality rate (or constant catch) scenario is achieved
- Settings:
  - Held constant for all years: Target fishing mortality (or catch), Fleet allocations, Growth, stock-recruit parameters, fleet selectivity and retention.
  - Recruitment in 2024: Can be specified as recent average or determined by using the stock-recruitment parameters as estimated by the base model.

Projection Methods (cont.)

- Growth, stock-recruit parameters, fleet allocations, selectivity & retention
  - Set as the average of the last 3-year estimates from the base model
    - Fleet allocations: Com LL = 1.7%, Com Other = 1.4%
      Rec East = 75.2%, Rec West= 21.8%
- Recruitment (Age 1) in Jan 2024
  - For equilibrium (long-term) projections: predicted by using the estimated stock-recruitment parameters & SSB in 2023 (SEDAR 79-RD-11).
  - For short-term projections: equal to the geometric mean of 2019-2023 Age 1 Recruitment (SEDAR 79-RD-11).

Projection Scenarios

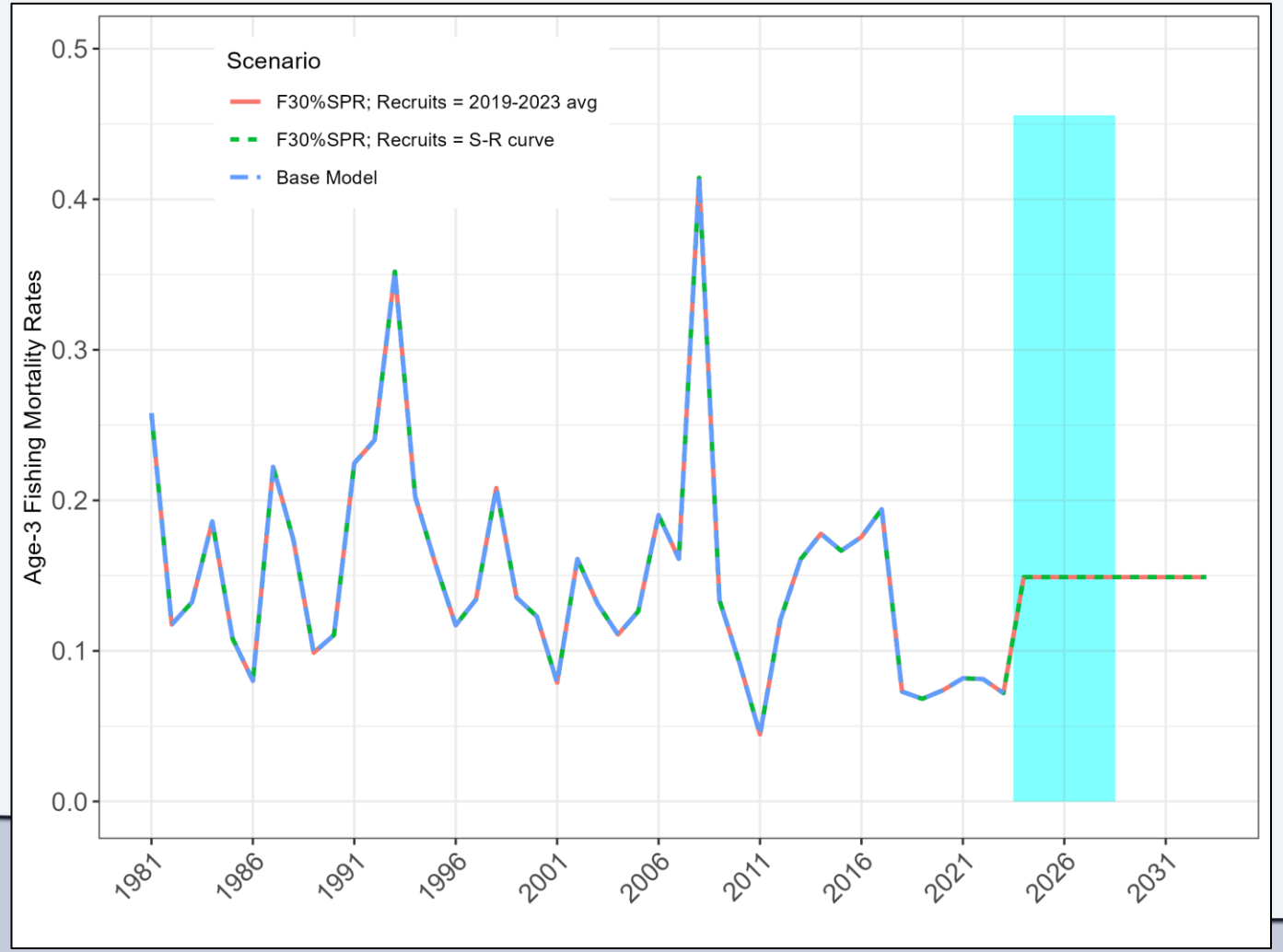


- Constant F scenarios In TORs (TOR 10):
  - $F_{30\%SPR}$
  - 75% of $F_{30\%SPR}$
  - $F_{40\%SPR}$ (Current definition of F_{OY}) but equal to 75% of $F_{30\%SPR}$
  - $F_{current}$ (average of 2021-2023 estimates)
- Expected SSC Recommendations:
  - F based on P* method
  - Constant catch scenarios?

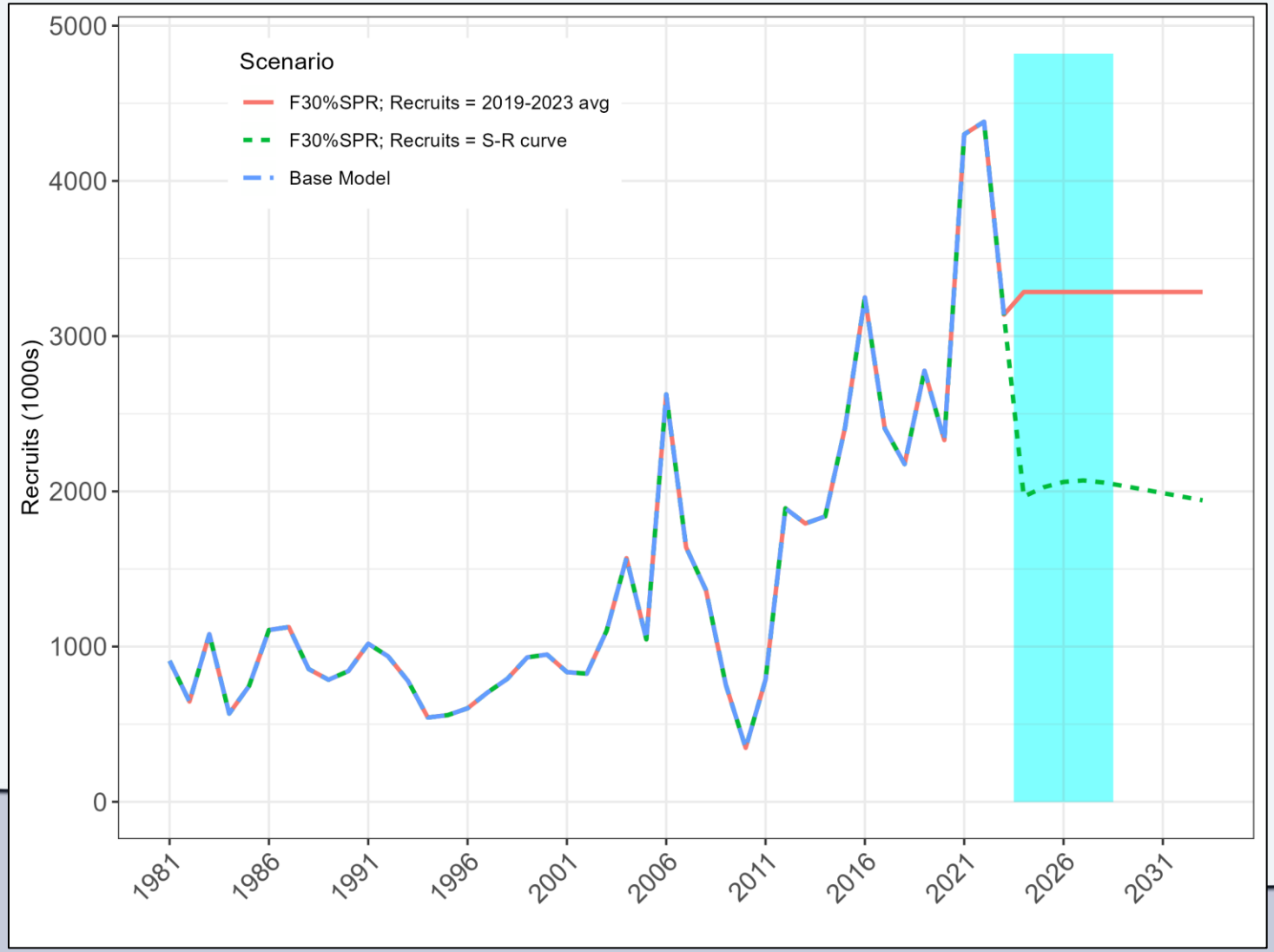
Projection Scenario – $F_{30\%SPR}$ (long and short-term)

Equilibrium Projections (Recruits = S-R Curve)							Short-Term Projections (Recruits = 2019-2023 avg)					
Year	Age 1 Recruits	F	SSB	Retained Yield	Retained Num	Released Num	Age 1 Recruits	F	SSB	Retained Yield	Retained Num	Released Num
2024	1.966	0.149	6,488	3,278,980	627,789	1,644,393	3.284	0.149	6,488	3,280,143	628,742	1,844,997
2025	2.026	0.149	6,864	3,372,143	623,832	1,302,368	3.284	0.149	6,867	3,384,760	630,618	1,694,199
2026	2.061	0.149	6,974	3,249,912	564,280	1,101,926	3.284	0.149	7,029	3,363,706	605,530	1,635,621
2027	2.070	0.149	6,821	3,023,751	495,817	1,036,220	3.284	0.149	7,089	3,313,030	583,152	1,618,291
2028	2.057	0.149	6,584	2,814,305	446,663	1,018,590	3.284	0.149	7,118	3,270,355	568,844	1,613,371
2029	2.035	0.149	6,342	2,650,664	415,719	1,009,913	3.284	0.149	7,130	3,239,178	560,244	1,611,911
2030	2.012	0.149	6,109	2,523,697	395,653	1,000,587	3.284	0.149	7,130	3,216,409	554,984	1,611,442
2031	1.989	0.149	5,889	2,421,114	381,362	989,955	3.284	0.149	7,123	3,199,290	551,639	1,611,282
2032	1.965	0.149	5,682	2,335,047	370,254	978,716	3.284	0.149	7,112	3,186,071	549,426	1,611,220
2033	1.942	0.149	5,490	2,261,068	361,084	967,345	3.284	0.149	7,098	3,175,662	547,907	1,611,193

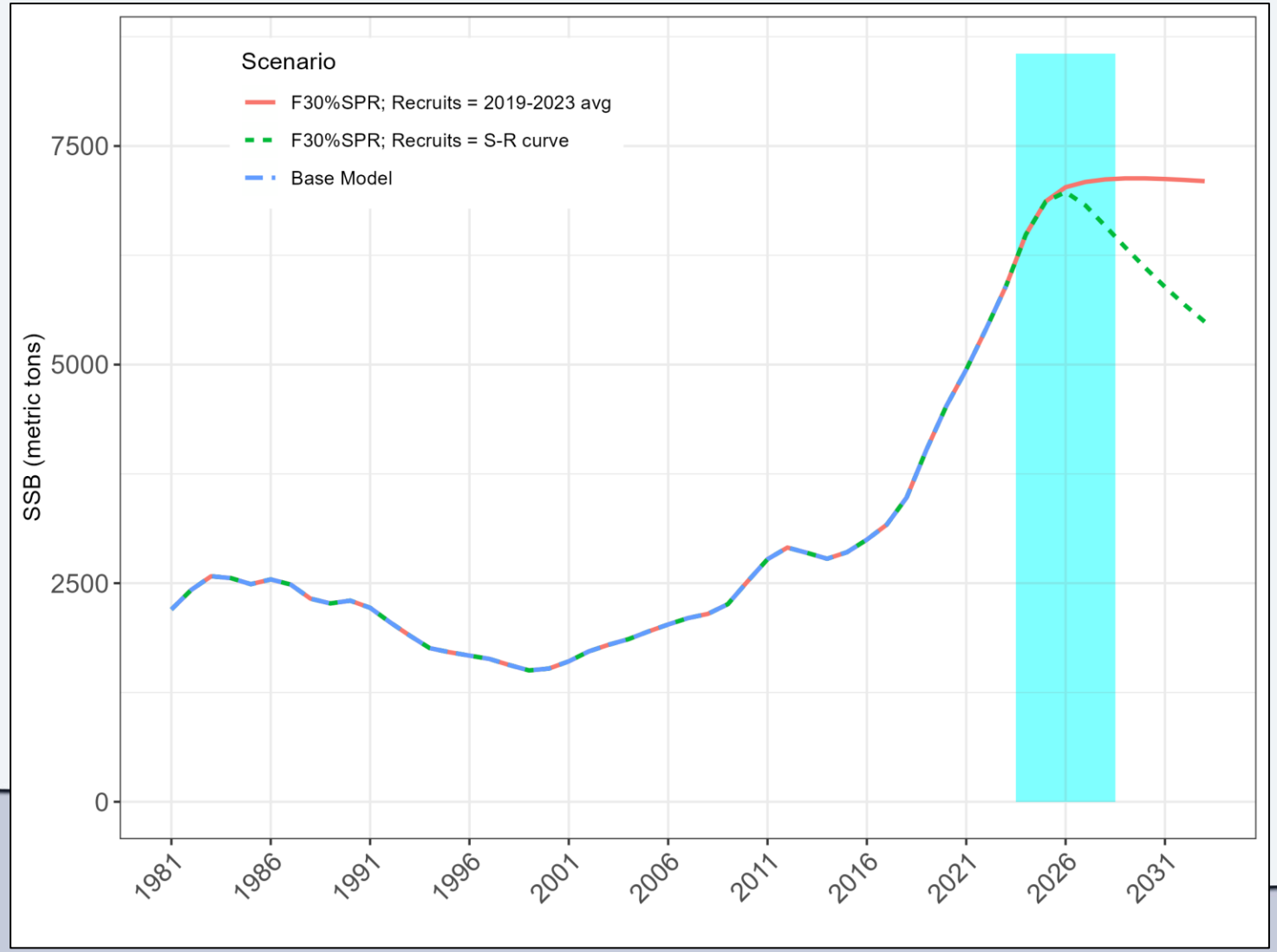
$F_{30\%SPR}$ Projection Scenario – Fishing Mortality



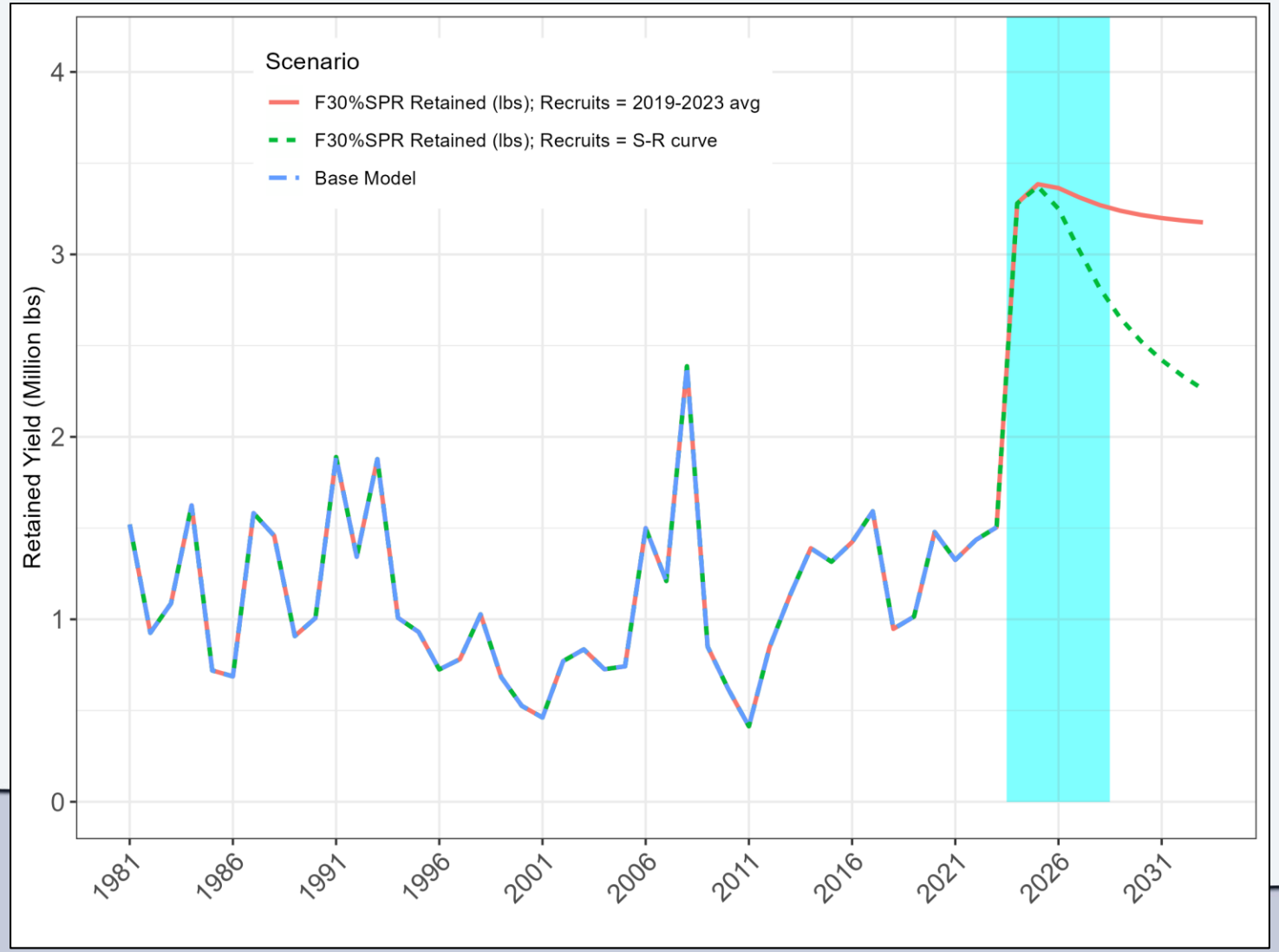
$F_{30\%SPR}$ Projection Scenario - Recruits



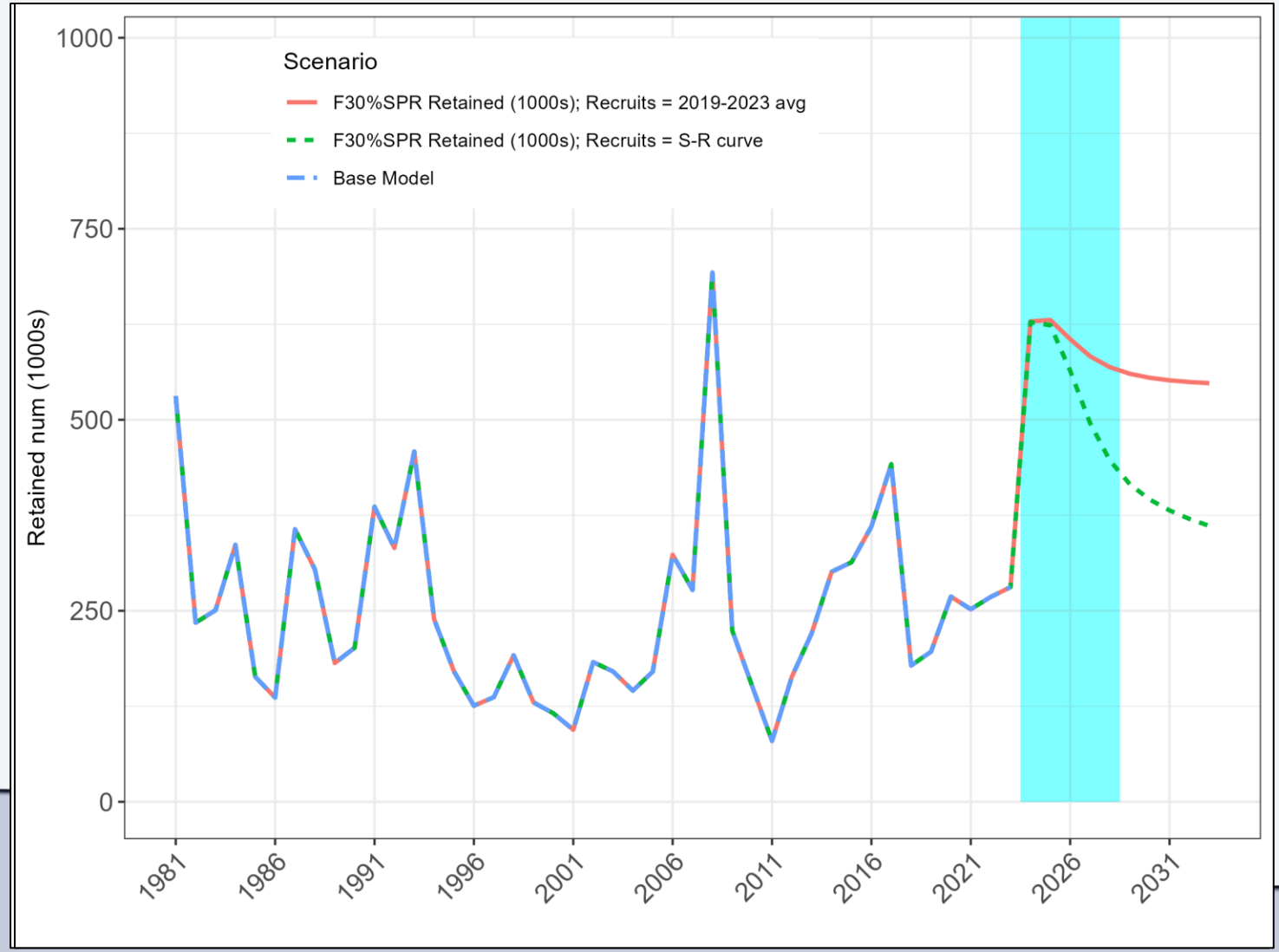
$F_{30\%SPR}$ Projection Scenario - SSB



$F_{30\%SPR}$ Projection Scenario – Retained Yield (lbs)



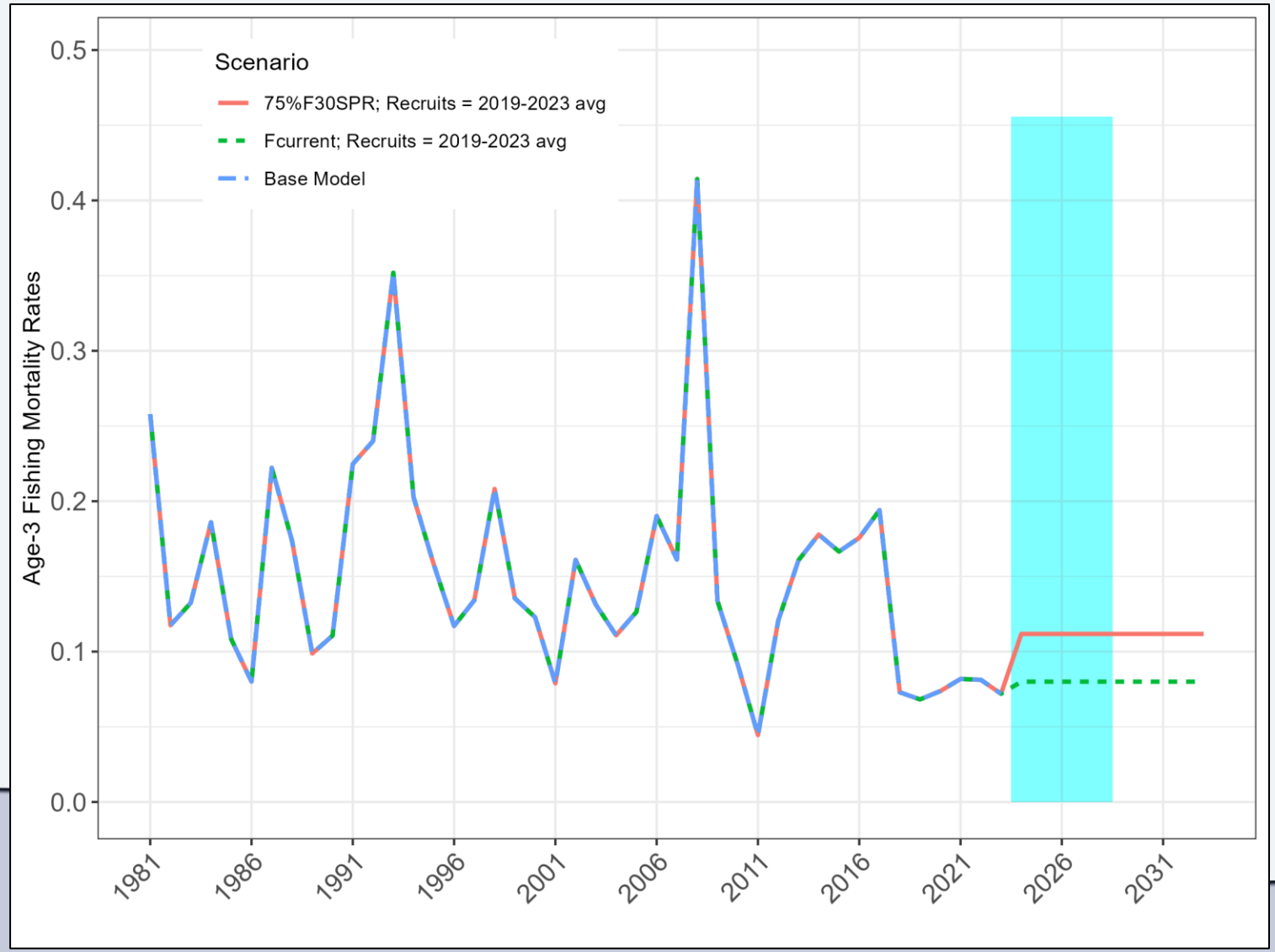
$F_{30\%SPR}$ Projection Scenario – Retained Yield (num)



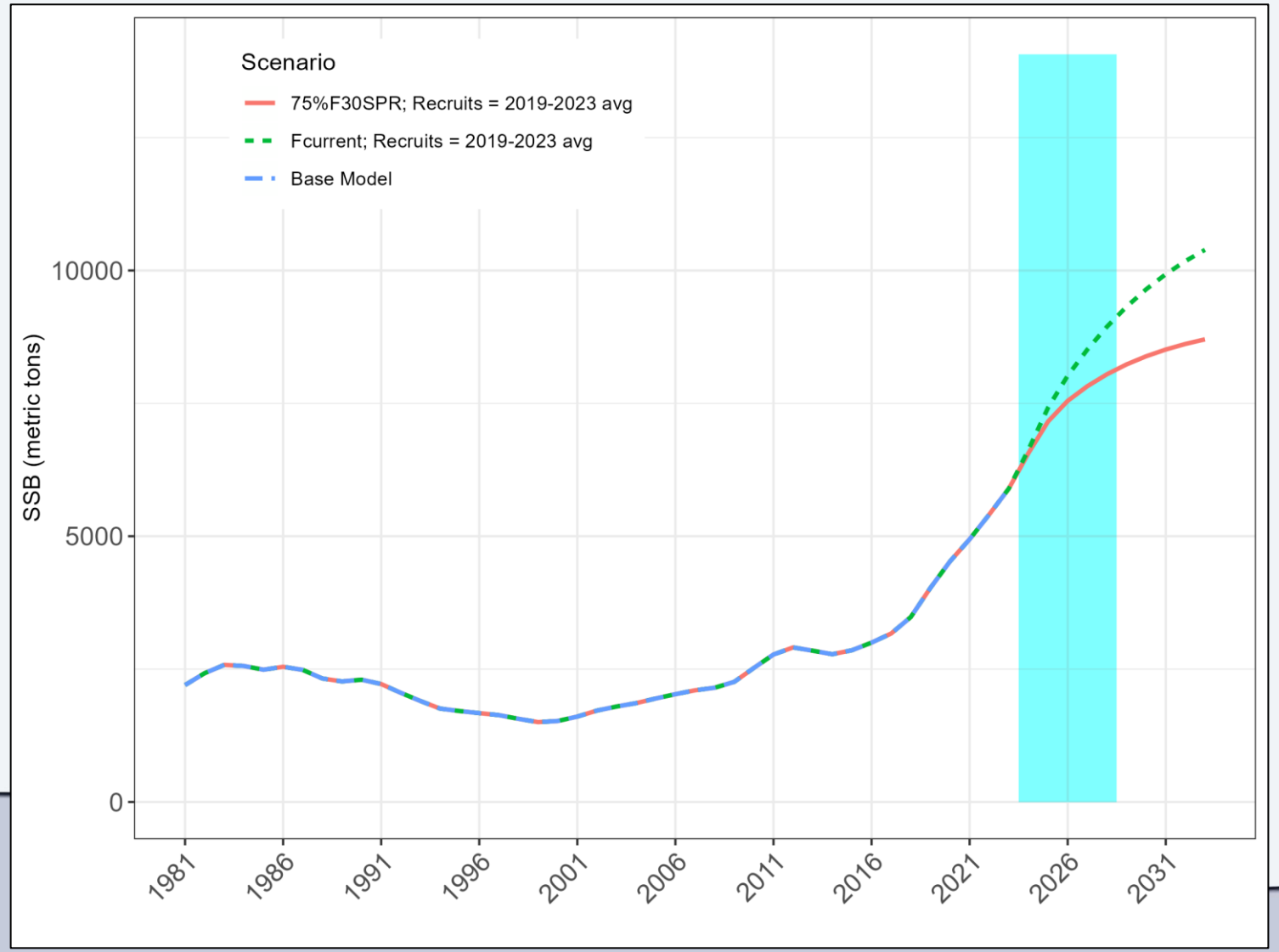
Projection Scenarios – $F_{current}$ & 75% $F_{30\%SPR}$

	Recruits = 2019-2023 avg F = 75% $F_{30\%SPR}$						Recruits = 2019-2023 avg F = Fcurrent					
Year	**Age 1 Recruits**	**F**	**SSB**	**Retained Yield**	**Retained Num**	**Released Num**	**Age 1 Recruits**	**F**	**SSB**	**Retained Yield**	**Retained Num**	**Released Num**
2024	3.284	0.112	6,565	2,498,073	479,551	1,401,786	3.284	0.080	6,631	1,811,994	348,293	1,014,735
2025	3.284	0.112	7,160	2,662,320	497,423	1,307,562	3.284	0.080	7,419	1,985,255	371,812	959,507
2026	3.284	0.112	7,547	2,725,359	491,431	1,270,669	3.284	0.080	8,022	2,084,741	376,453	937,997
2027	3.284	0.112	7,822	2,752,377	483,445	1,259,725	3.284	0.080	8,512	2,151,561	377,279	931,733
2028	3.284	0.112	8,047	2,772,615	478,662	1,256,565	3.284	0.080	8,942	2,206,166	378,545	929,928
2029	3.284	0.112	8,233	2,791,436	476,385	1,255,608	3.284	0.080	9,319	2,253,469	380,361	929,379
2030	3.284	0.112	8,386	2,808,849	475,505	1,255,296	3.284	0.080	9,646	2,294,626	382,360	929,197
2031	3.284	0.112	8,513	2,824,461	475,332	1,255,184	3.284	0.080	9,930	2,330,278	384,303	929,135
2032	3.284	0.112	8,618	2,838,173	475,501	1,255,144	3.284	0.080	10,177	2,361,052	386,090	929,112
2033	3.284	0.112	8,705	2,850,076	475,824	1,255,129	3.284	0.080	10,389	2,387,571	387,685	929,104

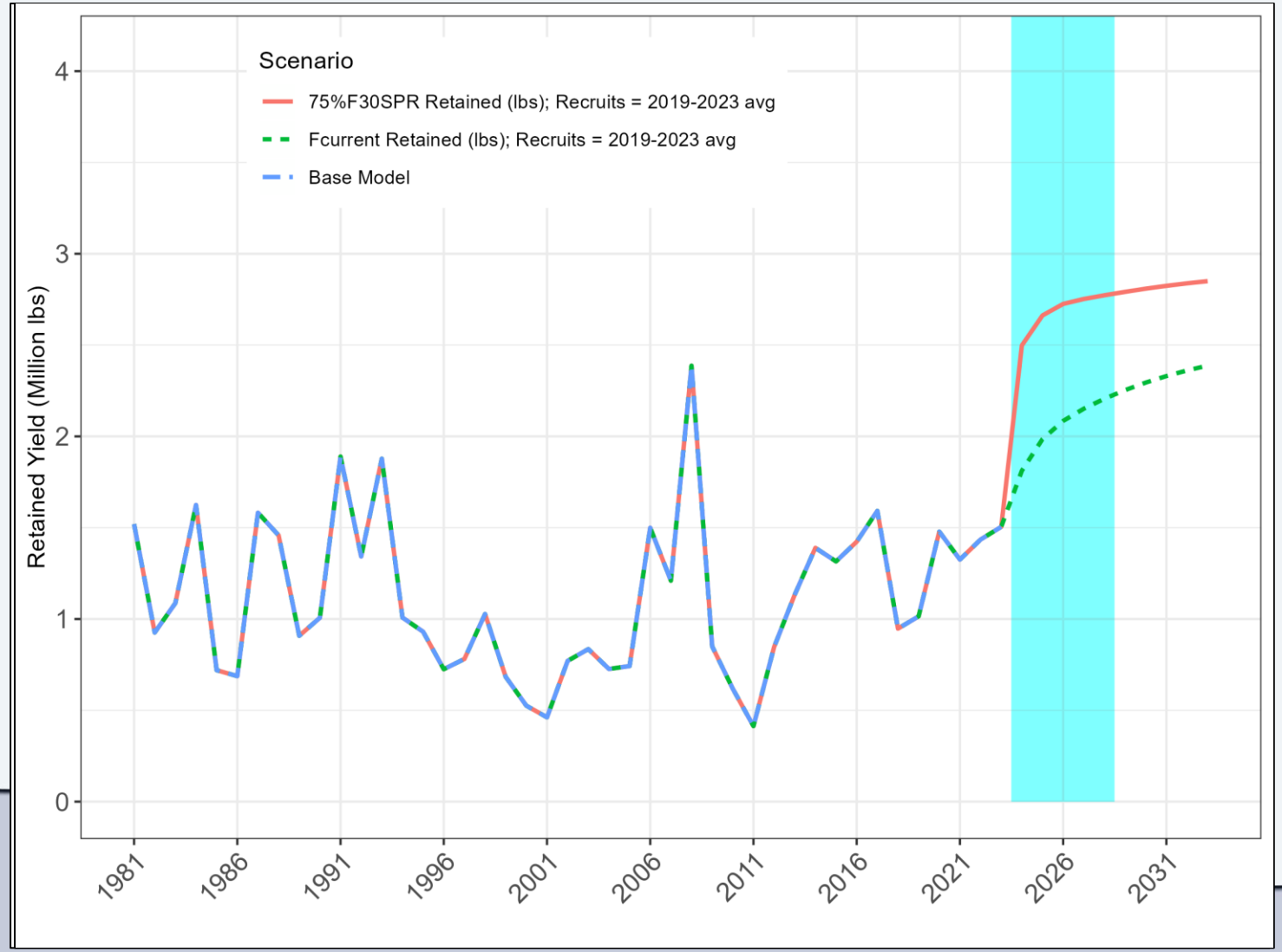
Other Projection Scenarios – Fishing Mortality



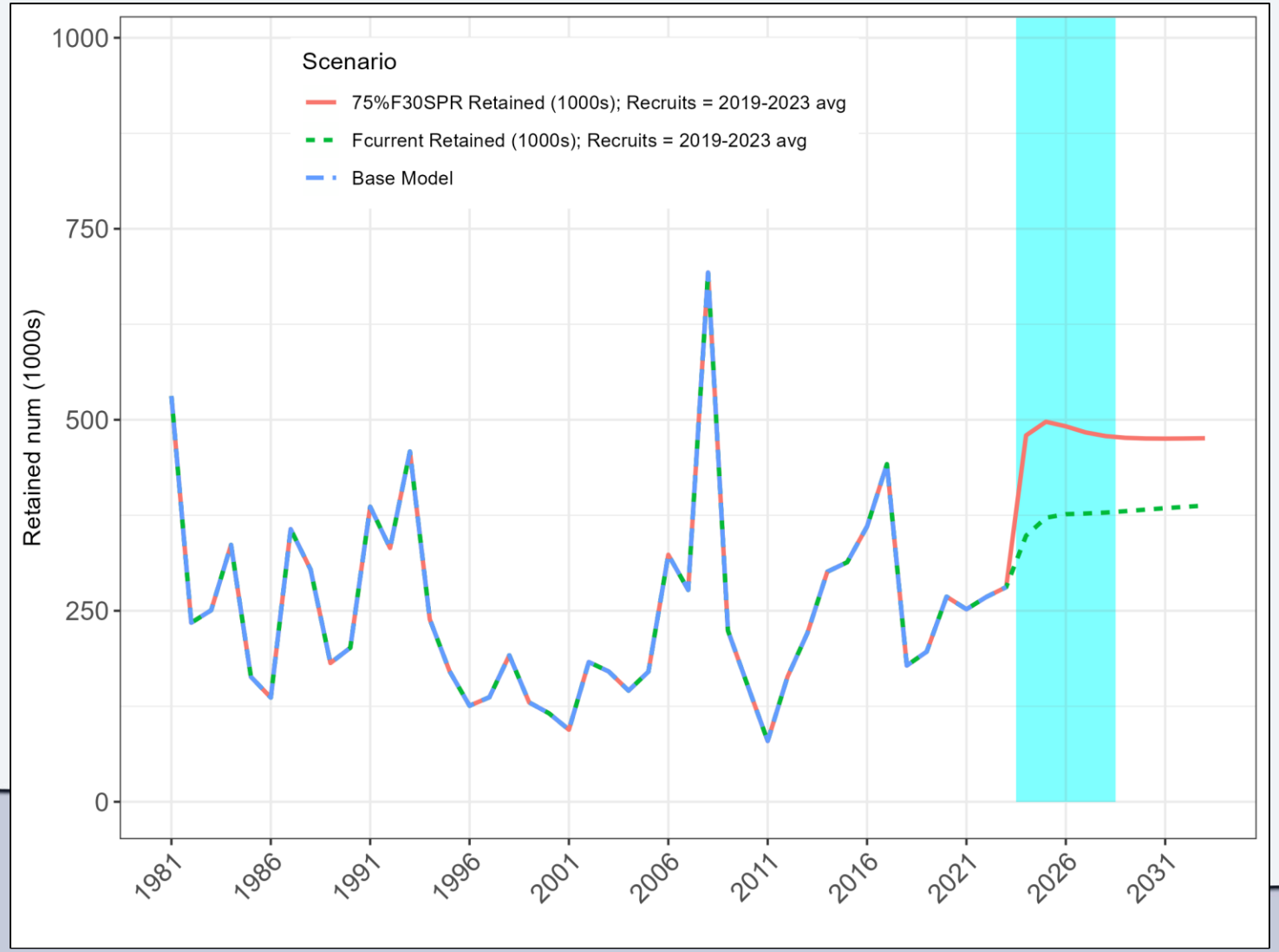
Other Projection Scenarios – SSB



Other Projection Scenarios – Retained Yield (lbs)



Other Projection Scenarios – Retained Yield (num)



Thank you for your attention!

Questions?

South Atlantic and Gulf of Mexico Fishery Management Councils (Amendment 41)		
Criteria	Definition	Base Model Value
$F_{30\%SPR}$	The fishing mortality rate associated with 30% SPR and the proxy used for F_{MSY}	0.149 yr^{-1}
$F_{40\%SPR}$	The fishing mortality rate associated with 40% SPR and the proxy used for F_{OY}	0.11 yr^{-1}
MFMT (Maximum Fishing Mortality Threshold)	$F_{30\%\ SPR}$	0.149 yr^{-1}
F_{OY}	$F_{40\%SPR}$	0.11 yr^{-1}
$F_{current}$ (recent average fishing mortality rate on age-3 fish)	The geometric mean of F on age-3 fish for 2021 - 2023	0.08 yr^{-1}
$SSB_{F30\%SPR}$	The estimated spawning stock biomass associated with F at 30% SPR	3,352 mt (7,389,895 lbs.)
MSST (Minimum Stock Size Threshold)	$0.75*SSB_{F30\%SPR}$	2,514 mt (5,542,421 lbs.)
$SSB_{current}$ (recent average of SSB)	The geometric mean of SSB for 2021 - 2023	5,403 mt (11,911,576 lbs.)
MSY proxy (Maximum Sustainable Yield Proxy)	Yield at $F_{30\%SPR}$	681.87 mt (1,503,266 lbs.)