



**NOAA
FISHERIES**



2025 Yellowtail Rockfish North of 40° 10' N. STAR presentation 4: Response to STAR requests from Day 2

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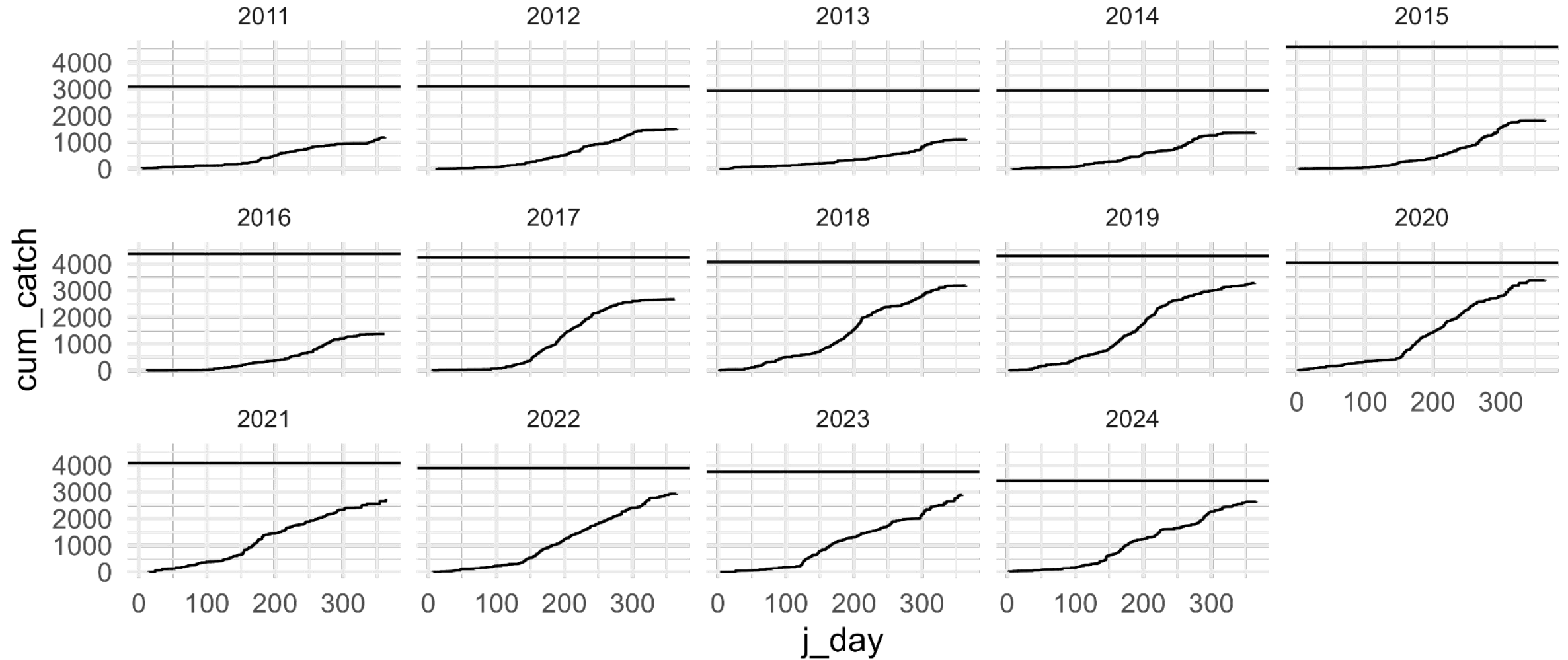
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Request 10

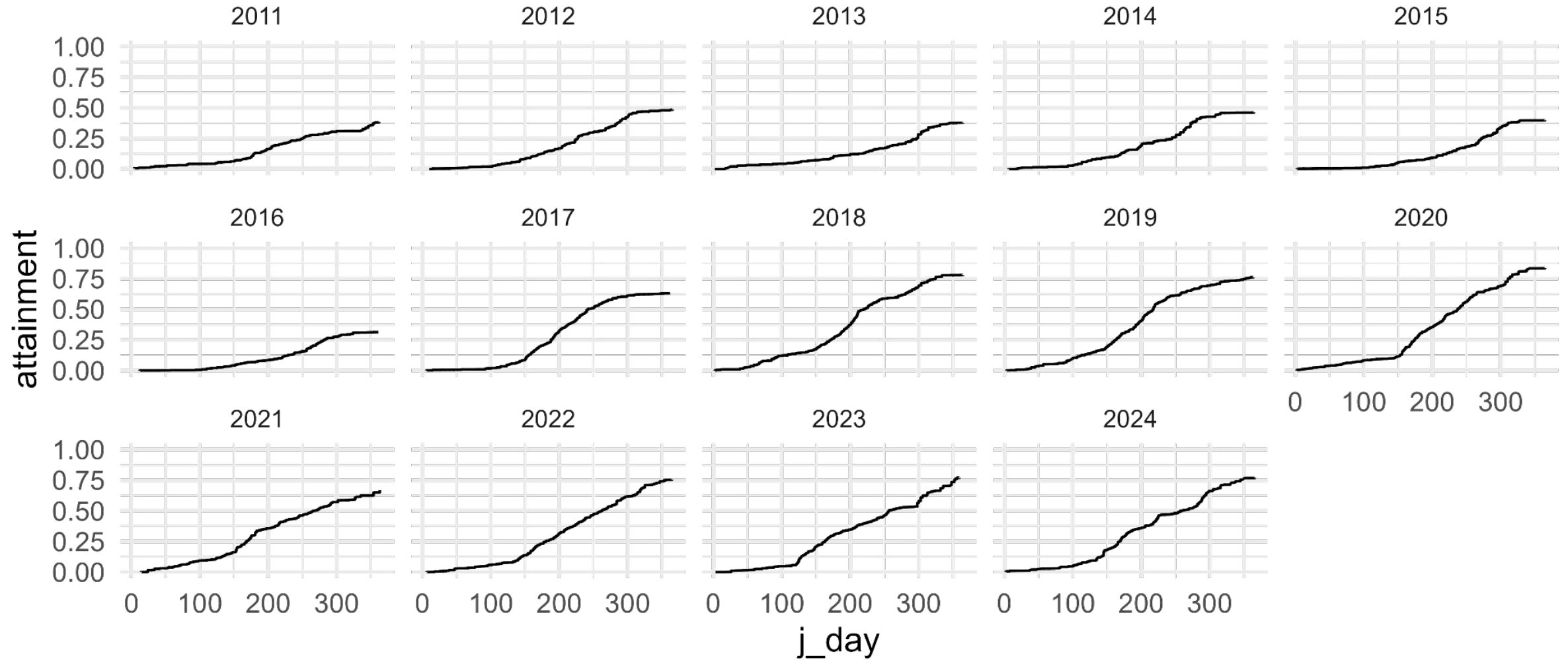
Plot, for each year, the cumulative proportion of the catch limit attained across the year for bottom trawl and midwater trawl trips.

Rationale: To see if fish are easier to catch in different years to evaluate consistency with the observations of fishermen provided in public comment.

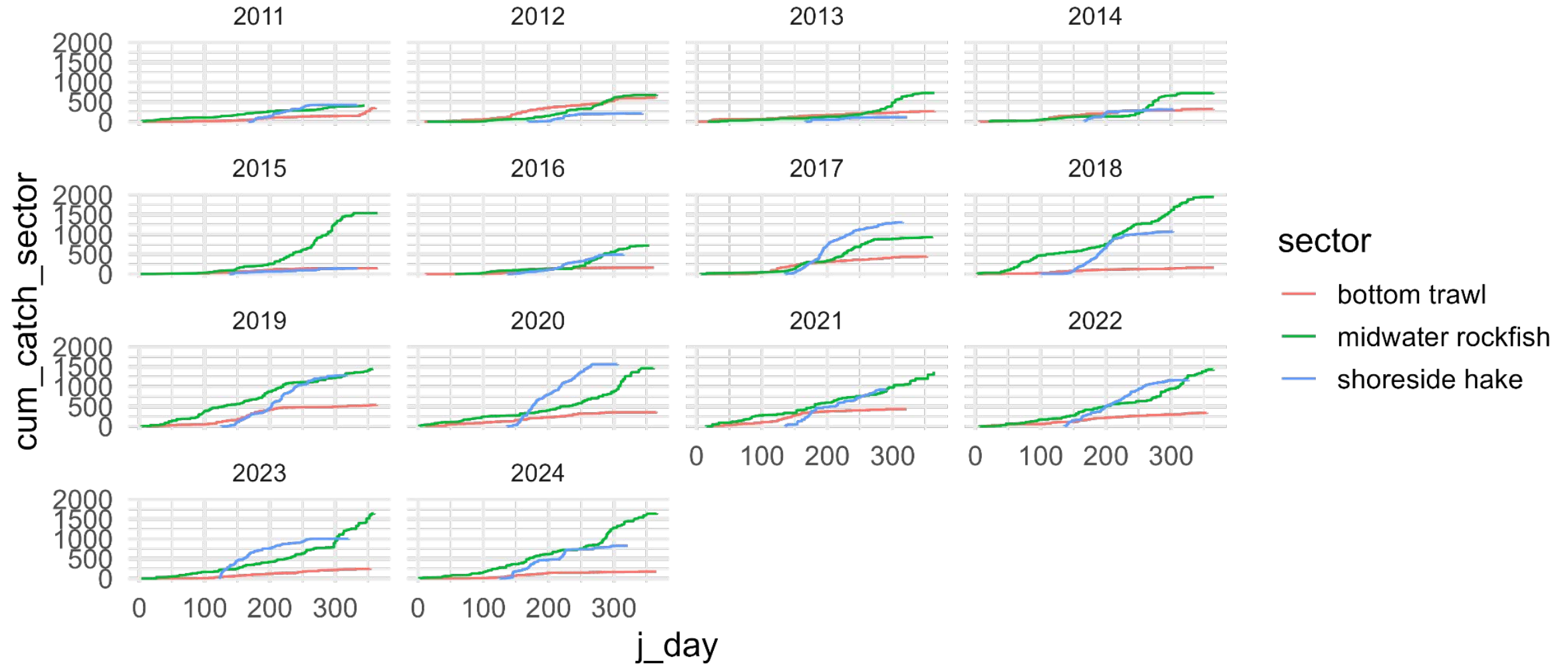
Cumulative catch



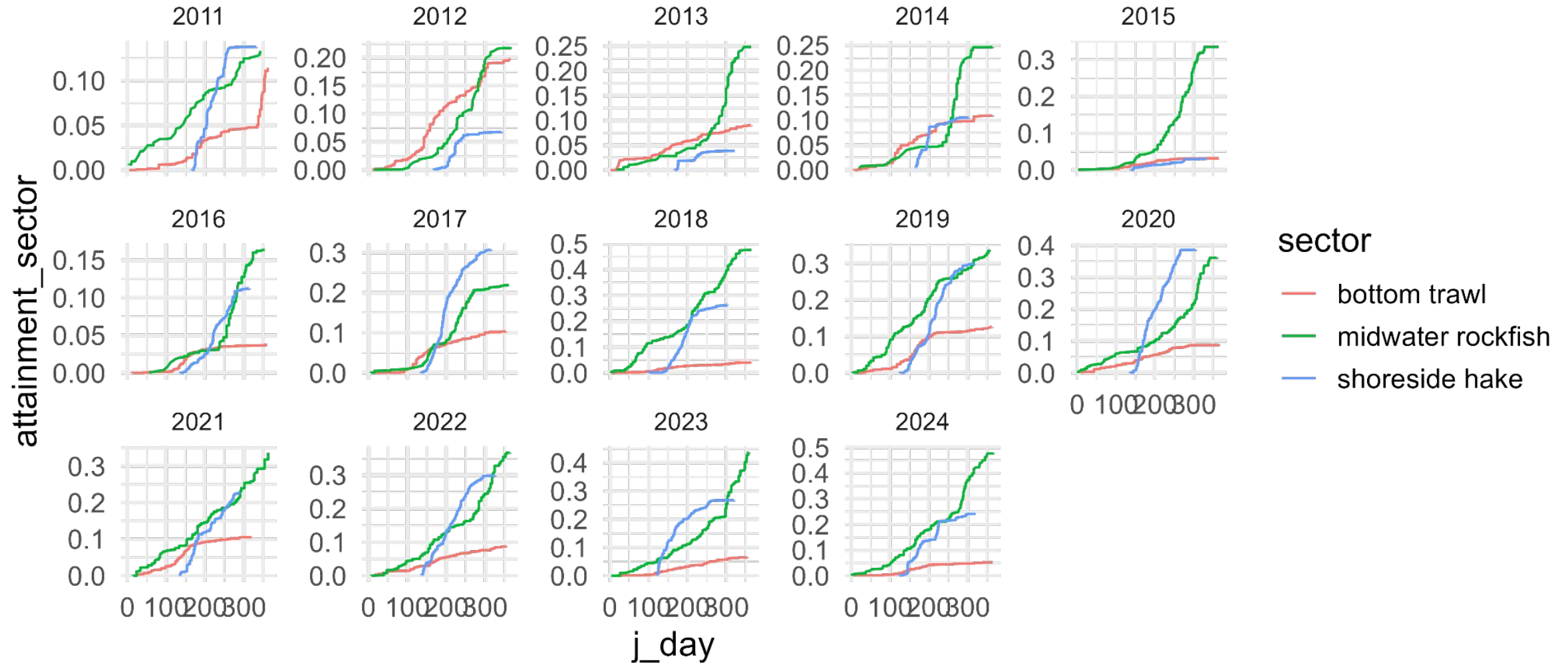
Cumulative attainment



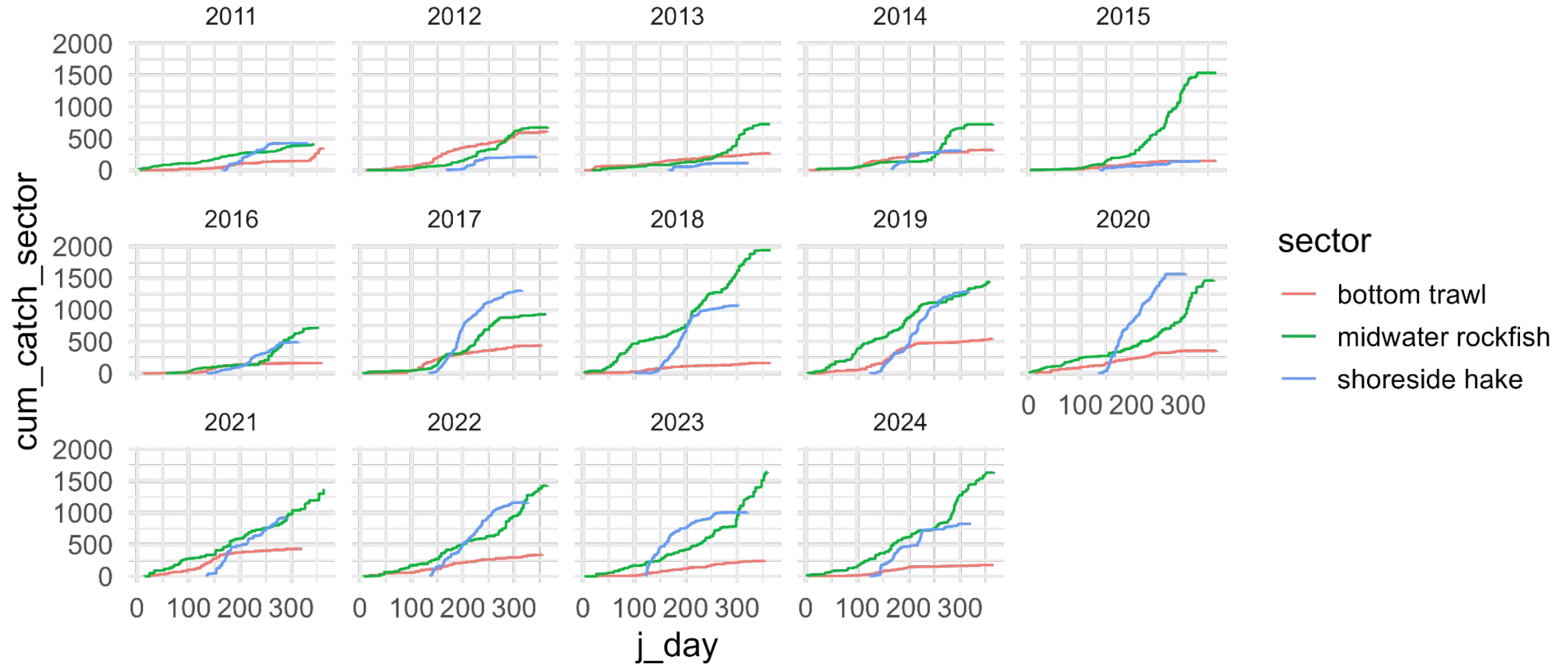
Cumulative catch by sector



Cumulative attainment by sector



Cumulative catch by sector



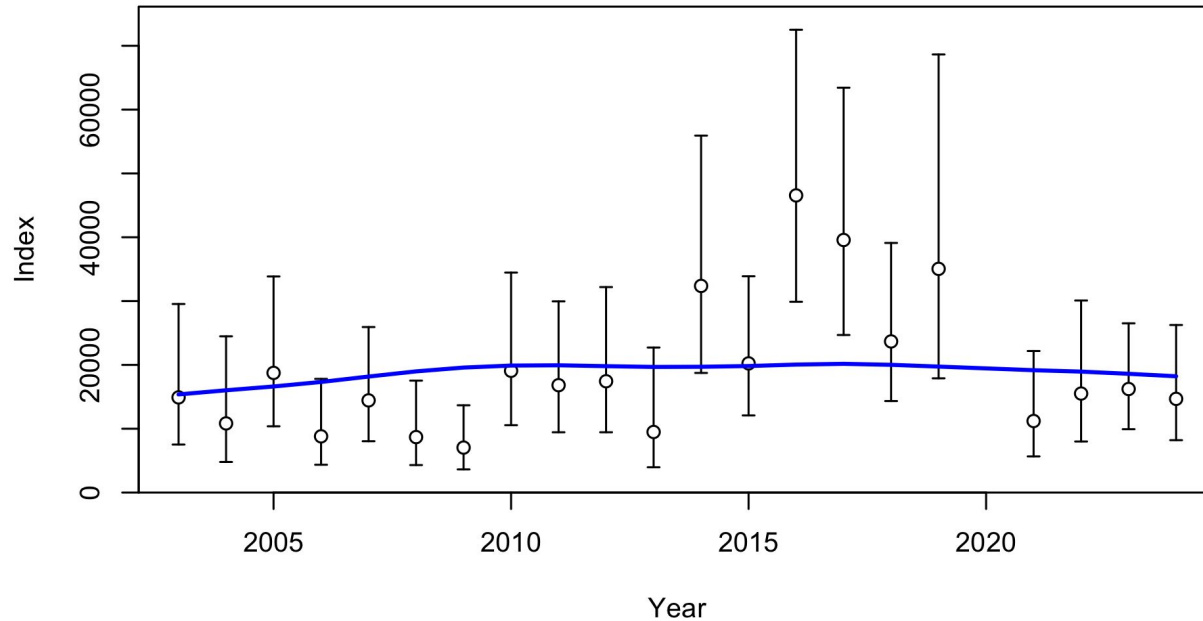
Request 11

Rerun the model with the commercial CPUE index in place of the WCGBTS. Show the fit to the commercial index and pertinent diagnostics.

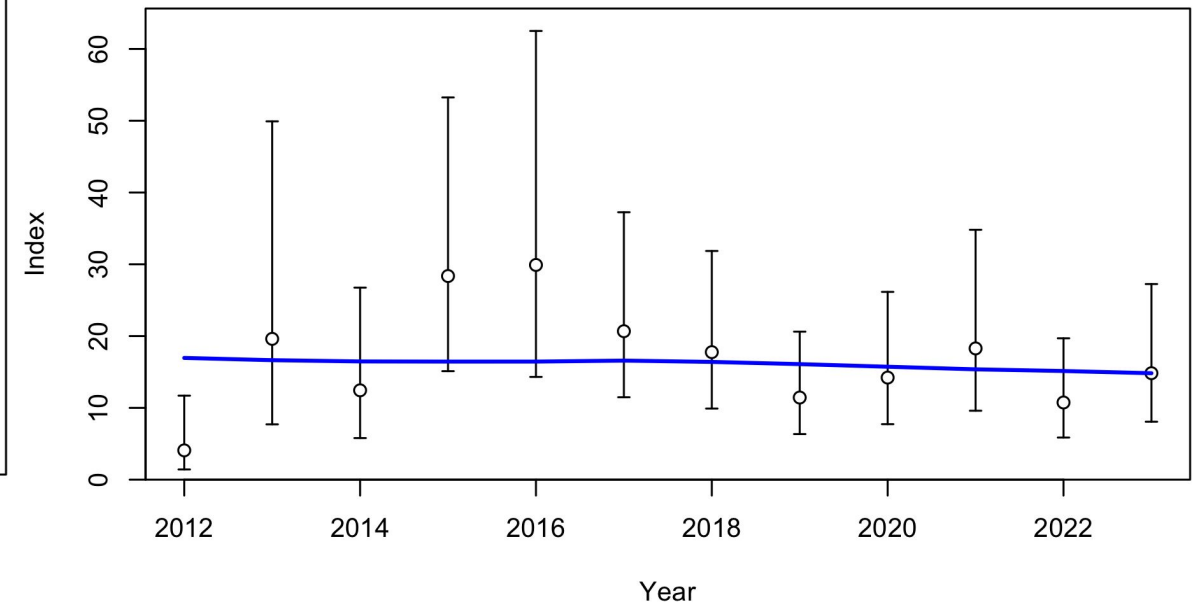
Rationale: The model was unable to fit high CPUE values from the WCGBTS and although they have a similar trend, investigation of the ability of the model to fit this trend in the commercial index can be explored.

Request 11: Fits to WCGBTS vs. Observer

Base Model (WCGBTS)

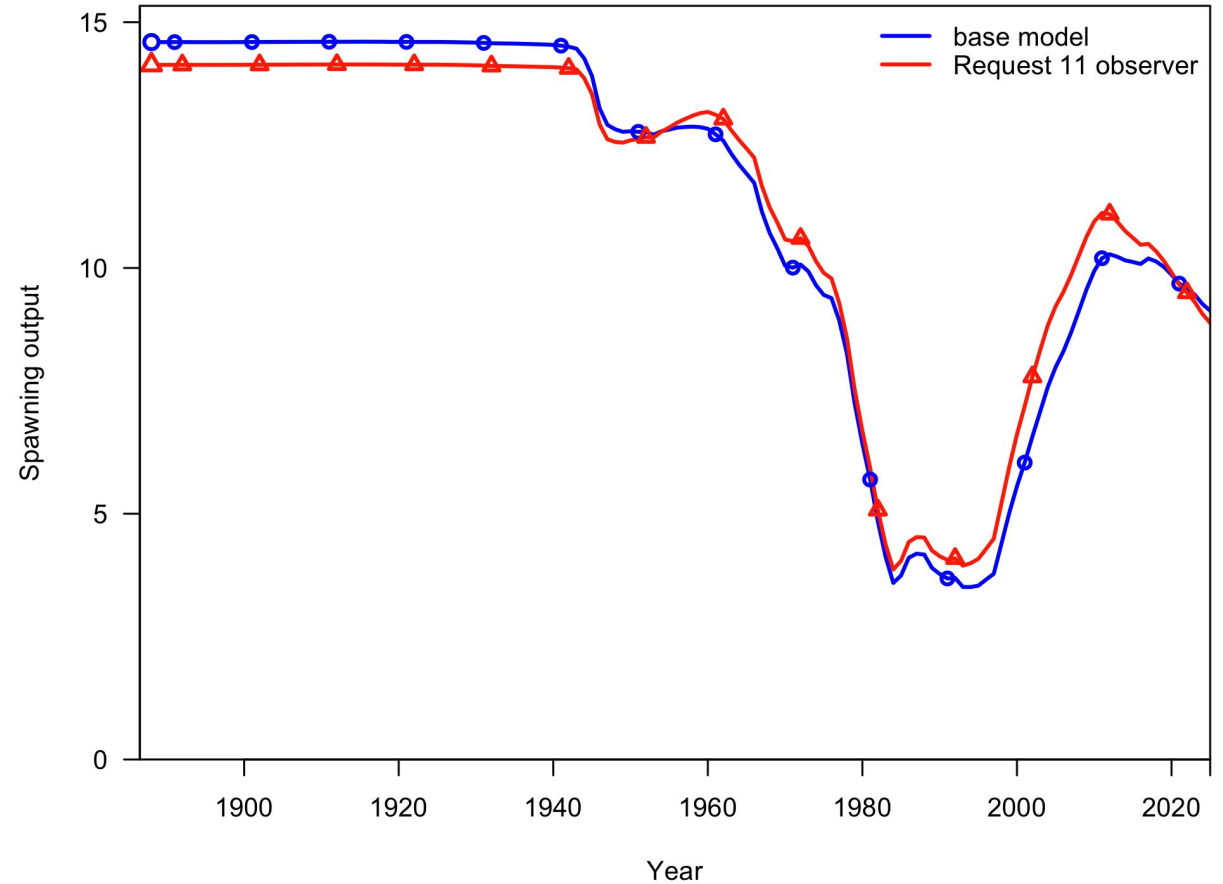
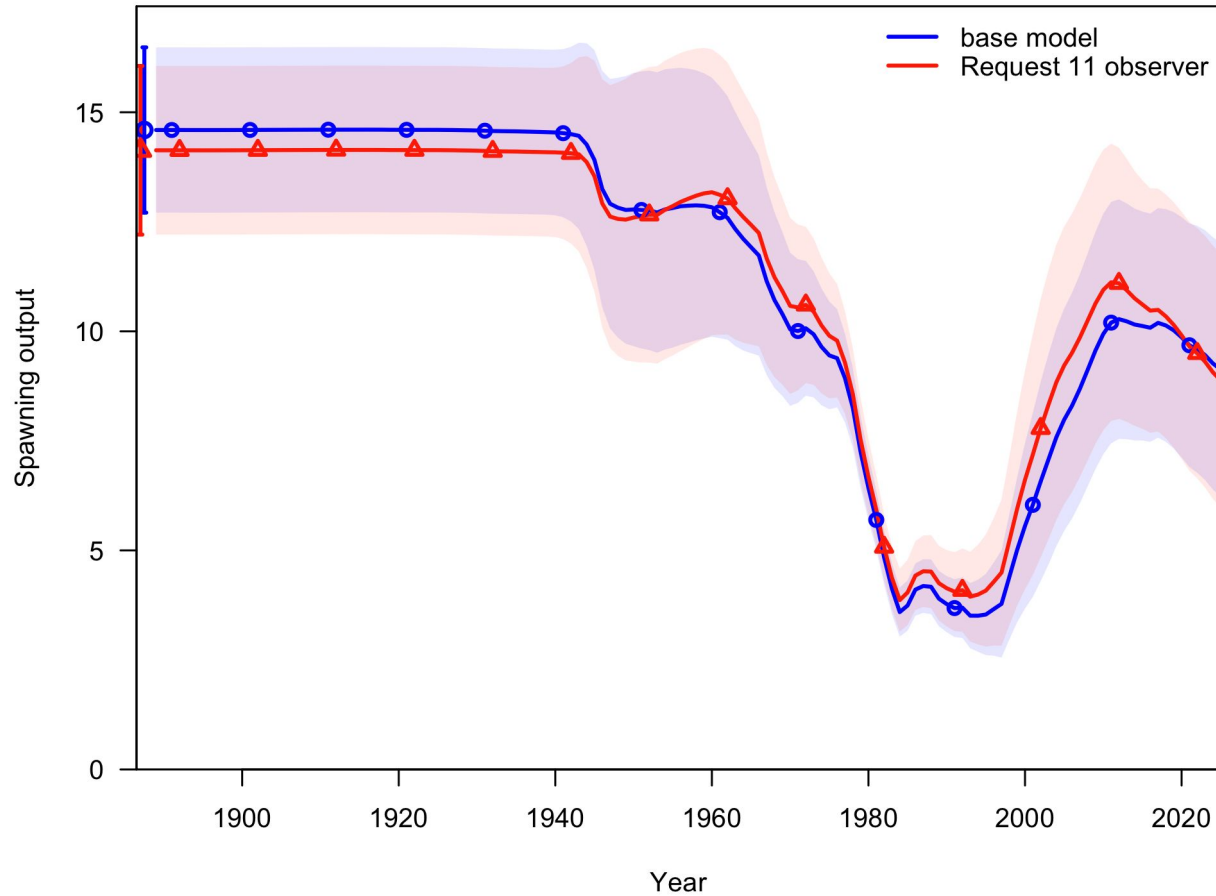


Request 11 (Observer)

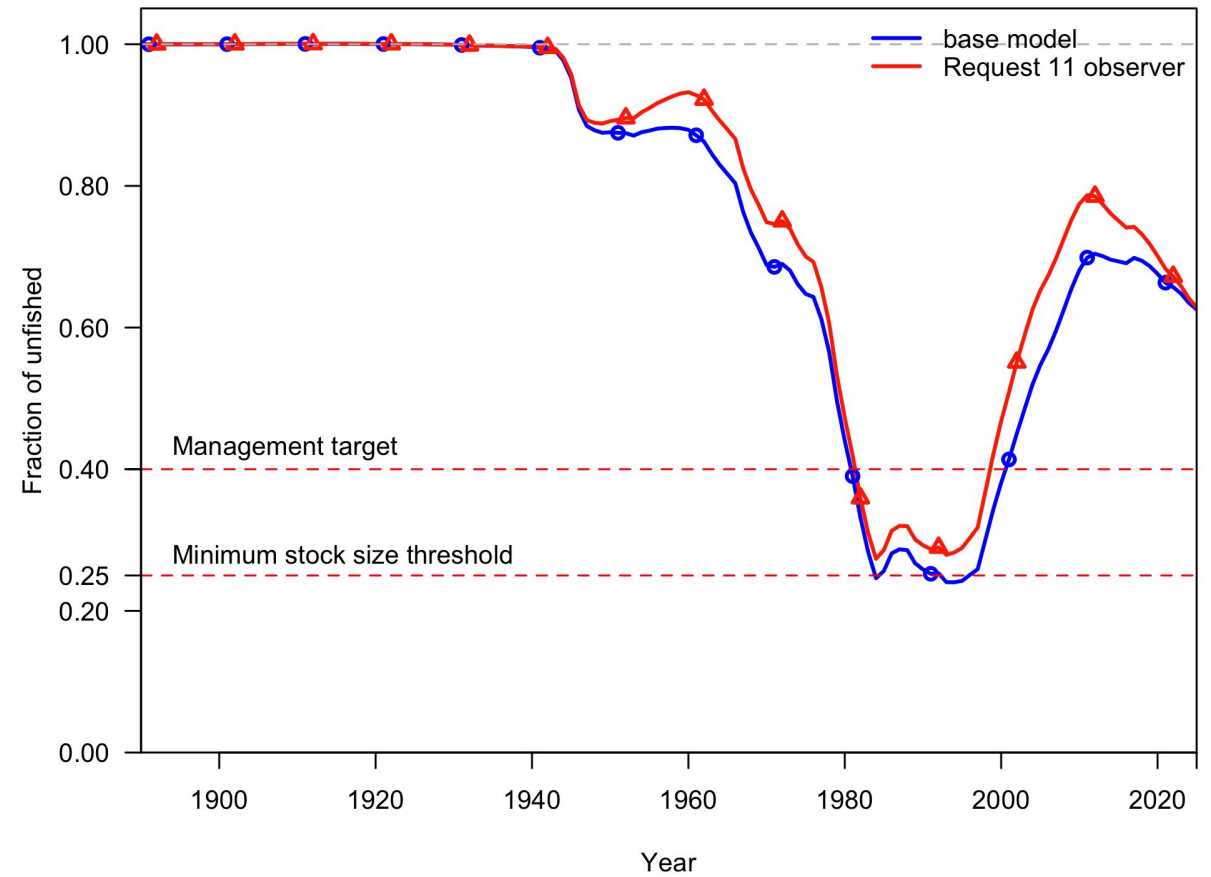
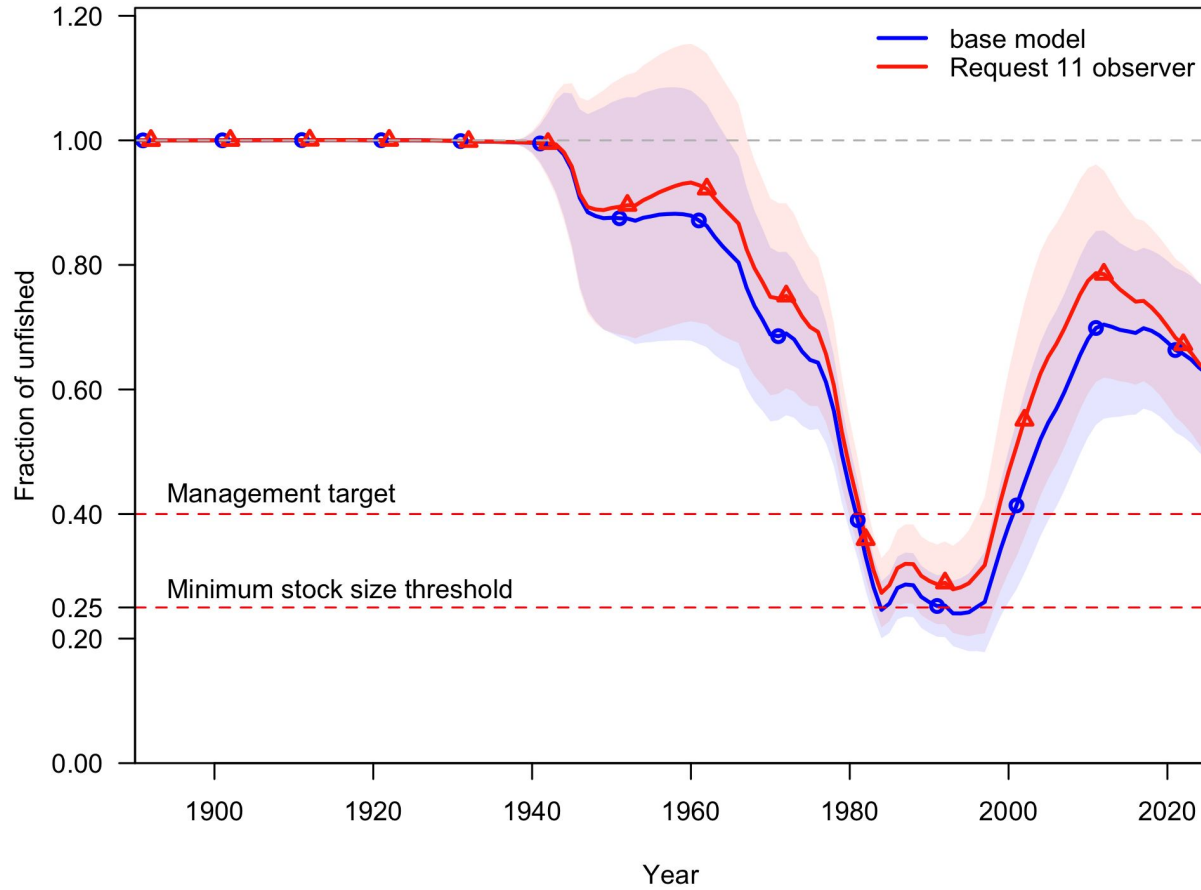


Request 11: Fits to WCGBTS vs. Observer

Spawning Output



Request 11: Fits to WCGBTS vs. Observer



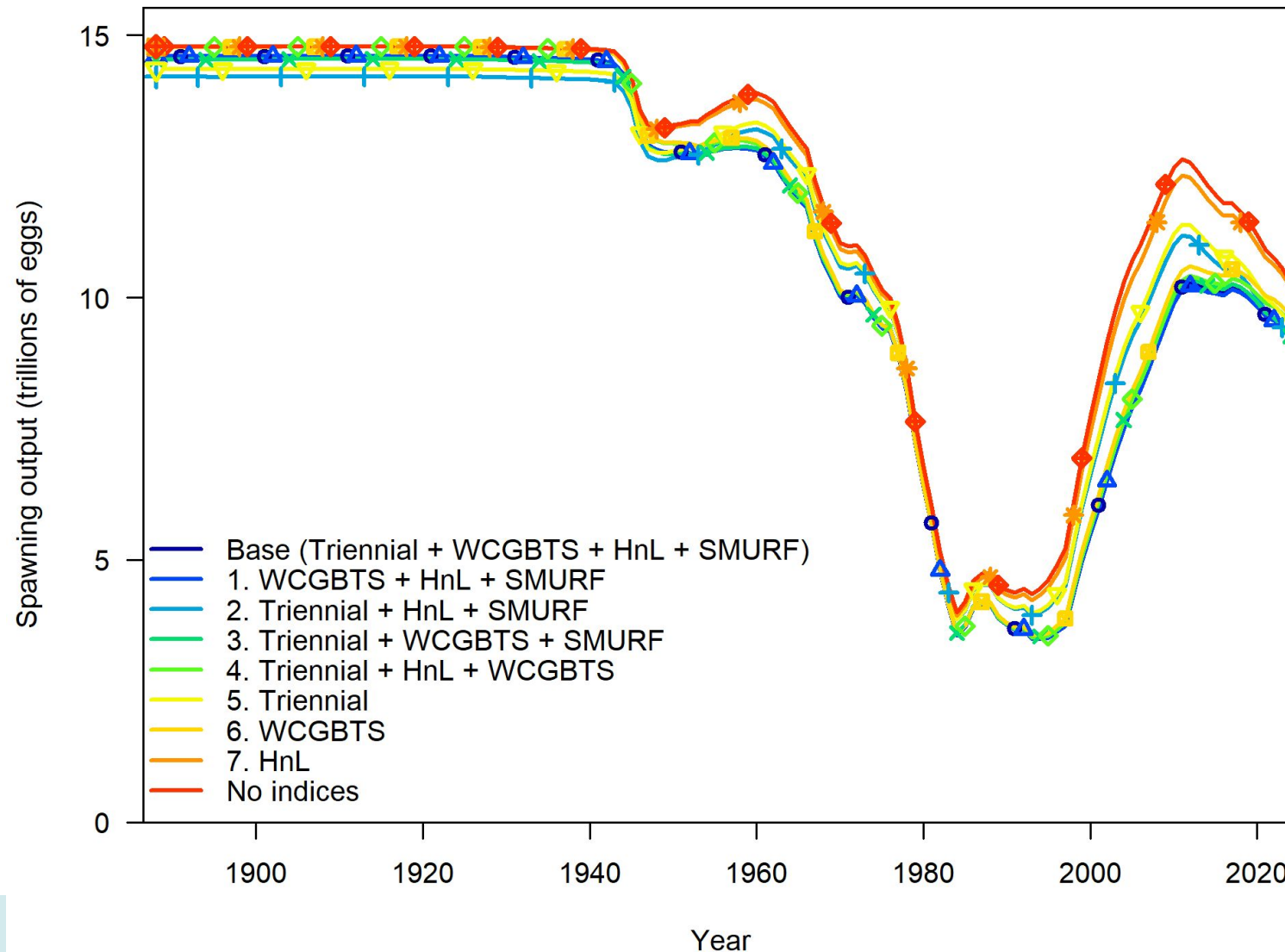
Request 12

Rerun the model using the fishery-independent index combinations below.

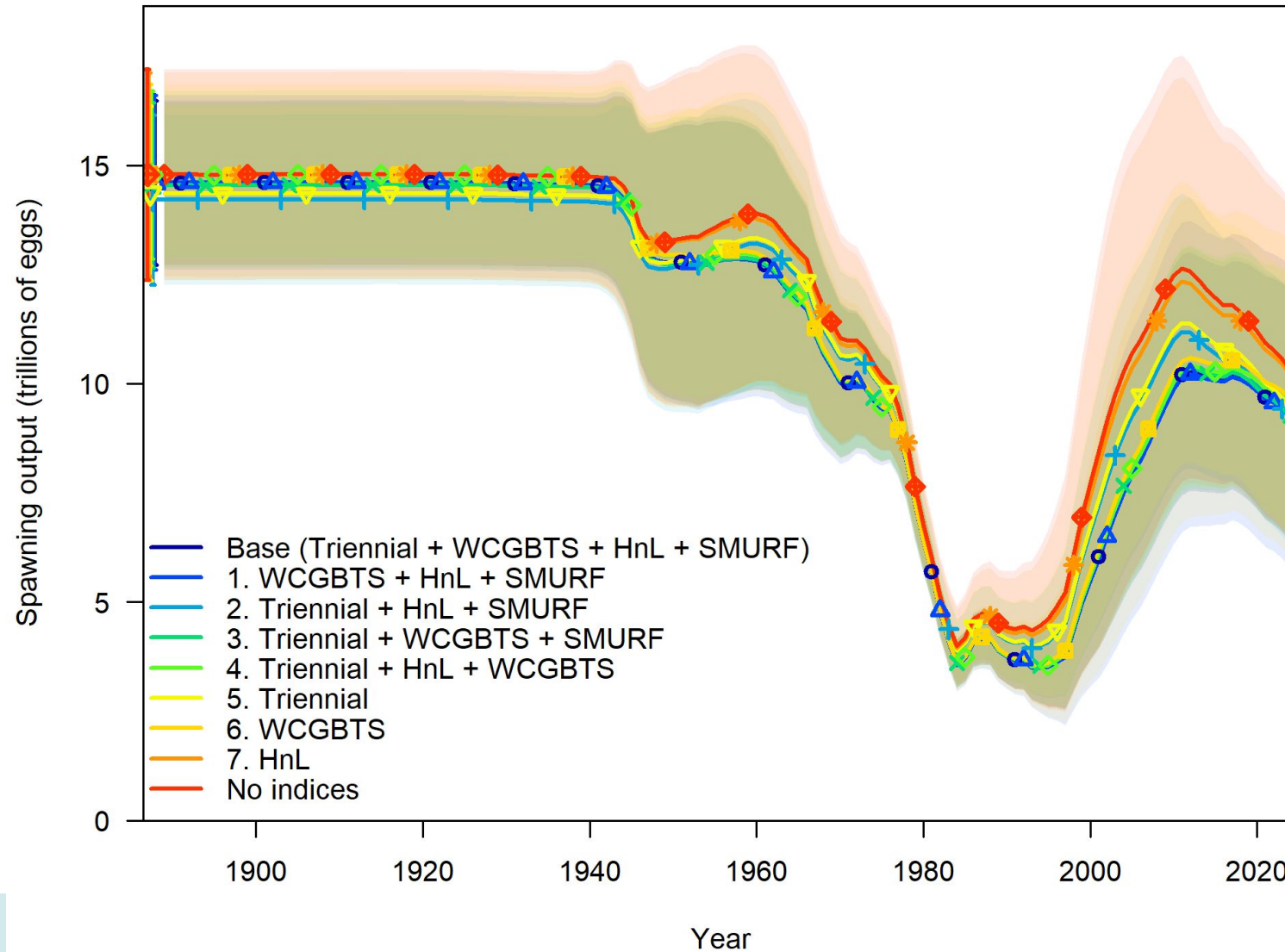
1. WCGBTS, H&L, SMURF
2. Triennial, H&L, SMURF
3. Triennial, WCGBTS, SMURF
4. Triennial, H&L, WCGBTS
5. Triennial
6. WCGBTS
7. H&L

Rationale: This will allow for the testing of the sensitivity of the model to each index.

Request 12



Request 12



Request 12

Label	Base (Triennial + WCGBTS + HnL + SMURF)	1. WCGBTS + HnL + SMURF	2. Triennial + HnL + SMURF	3. Triennial + WCGBTS + SMURF	4. Triennial + HnL + WCGBTS	5. Triennial	6. WCGBTS	7. HnL	No indices
Diff. in likelihood from base model									
Total	0	-7.99	-3.33	1.61	-7.46	-9.36	-14.08	-18.9	-17.64
Index	0	-7.999	-2.355	1.983	-5.329	-6.033	-11.674	-15.567	NA
Length comp	0	0.347	-1.336	-0.081	-0.878	-2.312	-0.68	-2.081	-2.267
Age comp	0	-0.3	-0.699	-0.512	-0.368	-1.689	-1.411	-2.299	-3.11
Recruitment	0	-0.03	0.904	0.218	-0.16	0.915	0.141	1.512	1.978
Parm priors	0	-0.006	0.179	0.011	0	0.186	0.016	0.254	0.29
Estimates of key parameters									
Recruitment unfished	36.63	36.352	43.548	36.98	37.093	44.288	37.83	48.705	50.379
log(R0)	10.509	10.501	10.682	10.518	10.521	10.698	10.541	10.794	10.827
M Female	0.157	0.156	0.168	0.157	0.157	0.168	0.158	0.172	0.174
M Male	0.136	0.135	0.146	0.137	0.136	0.146	0.137	0.149	0.151
L at Amax Female	52.9	53.0	52.9	52.9	52.9	52.9	53.0	53.0	53.0
L at Amax Male	47.9	48.0	47.9	47.9	47.9	47.9	48.0	48.0	48.0
Estimates of derived quantities									
Unfished age 4+ bio 1000	135.0	134.7	138.9	135.0	136.7	140.7	137.6	147.7	149.3
B0 trillions of eggs	14.6	14.6	14.2	14.5	14.8	14.4	14.8	14.8	14.8
B2025 trillions of eggs	9.13	9.112	9.009	9.114	9.42	9.272	9.518	10.037	10.101
Fraction unfished 2025	0.626	0.624	0.634	0.627	0.637	0.646	0.644	0.679	0.683
Fishing intensity 2024	0.638	0.64	0.607	0.636	0.624	0.593	0.616	0.549	0.541
Catchability for WCGBTS	0.329	0.331	0.329	0.327	0.324	0.329	0.319	0.329	NA

Request 13

Explore alternative models to inform decision tables such as those based on R_0 , natural mortality or data weighting alternatives between the WCGBTS and the composition data as well as McAllister Ianelli as opposed to Francis data weighting. Provide the range of spawning output and relative depletion over time. Examine the fits and outputs to ensure the resulting models are feasible.

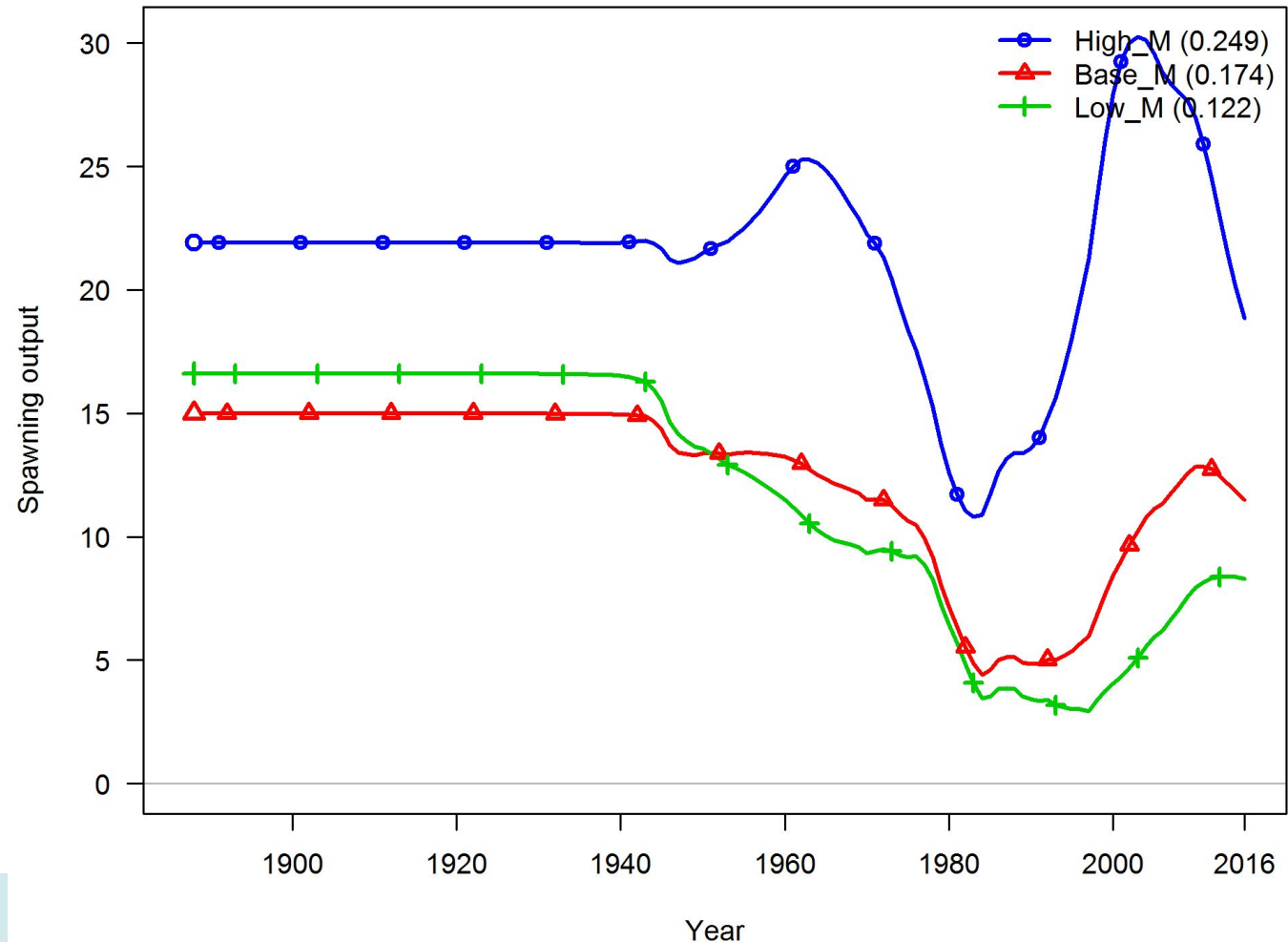
Rationale: R_0 and natural mortality display a wide range of spawning output of parameter values in explored sensitivities and the alternative weighting provides information on uncertainty from model structure.

Request 13

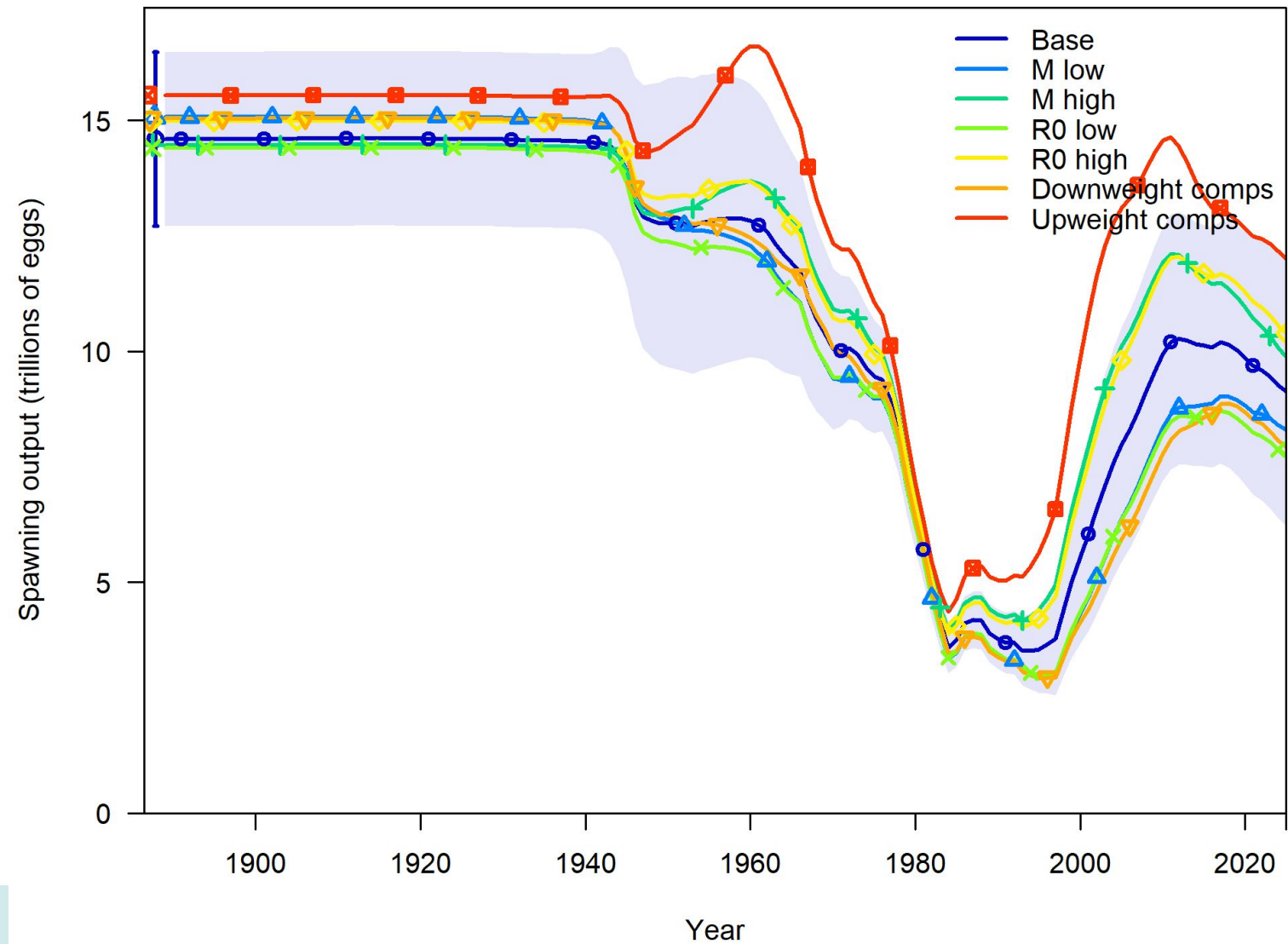
- Background: alternative states from 2017 span an implausibly large range of M values, but the uncertainty based on the profile is too narrow.
- M and R_0 range calculated based on ToR suggestion:

One method bases uncertainty in management quantities for the decision table on the asymptotic standard deviation for the OFL in the final year of the model from the base model. Specifically, the current year spawning biomass for the high and low states of nature are given by the base model mean plus or minus 1.15 standard deviations (i.e., the 12.5th and 87.5th percentiles). A search across fixed values of $\ln R_0$ are then used to attain the current year spawning biomass values for the high and low states of nature.

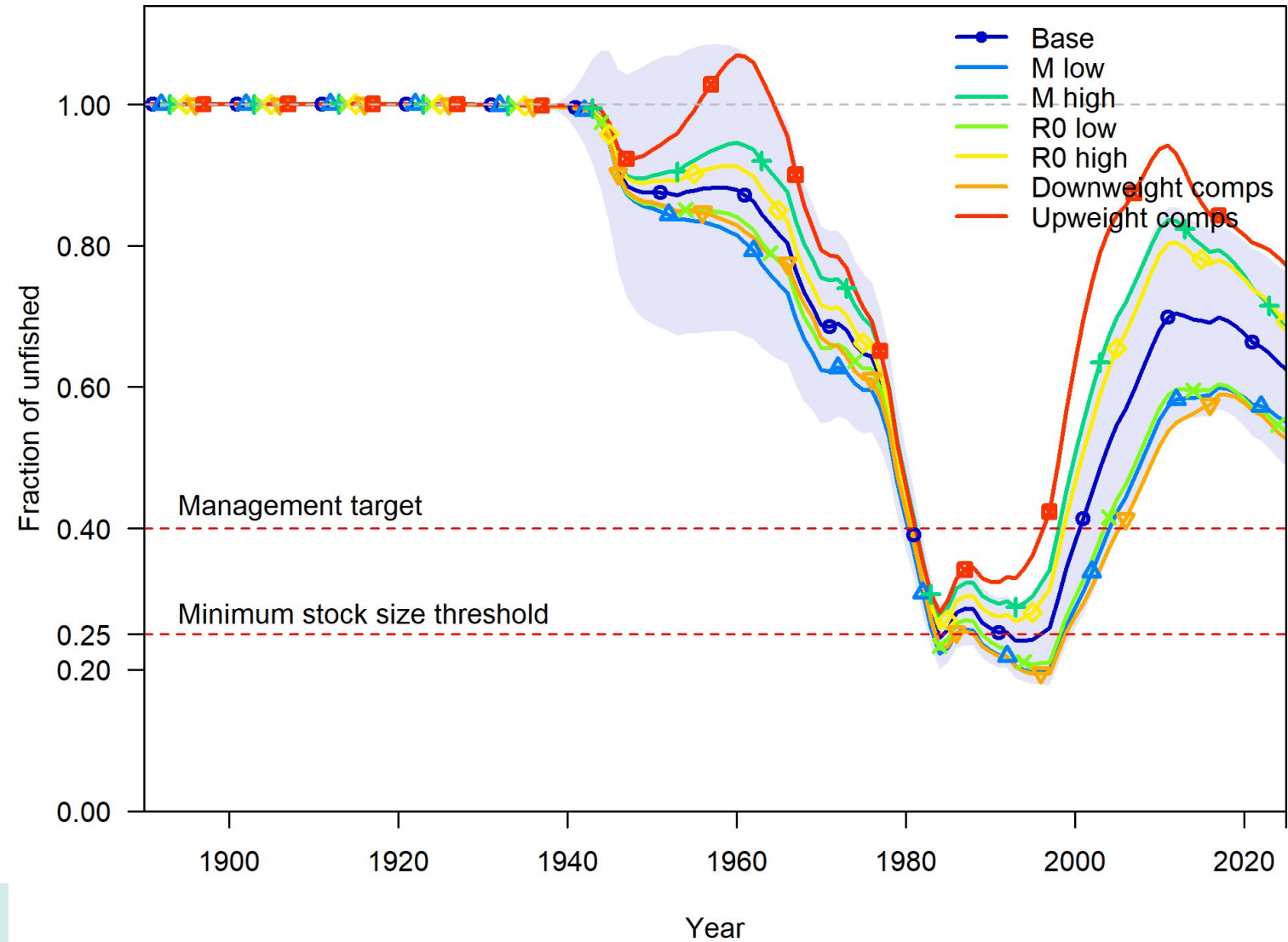
States of nature from 2017 assessment



Request 13



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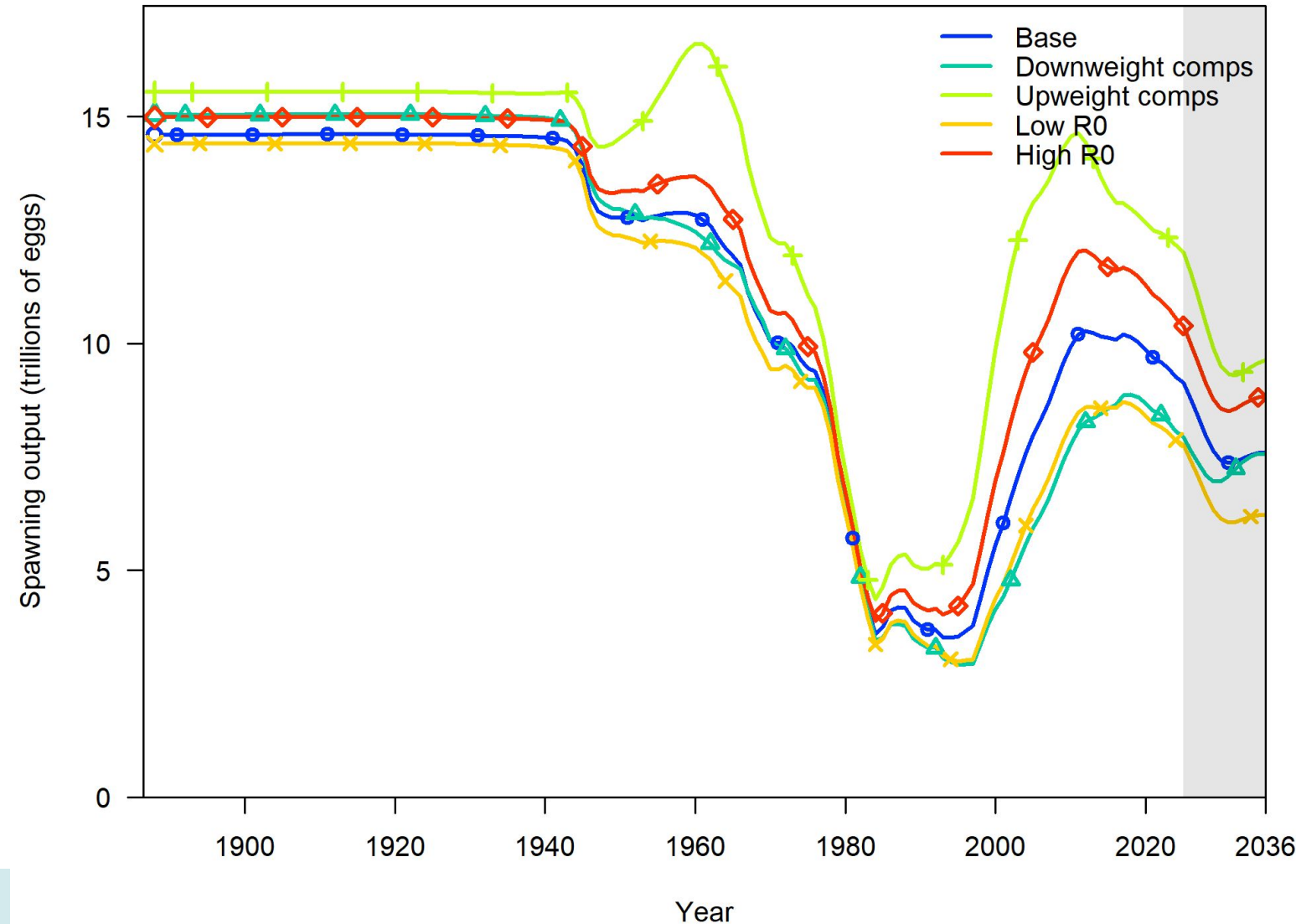
Request 13

Range of 2025 OFL
based on ToR guidance
and estimated OFL
sigma = 0.186:
low = 4392, high = 6739

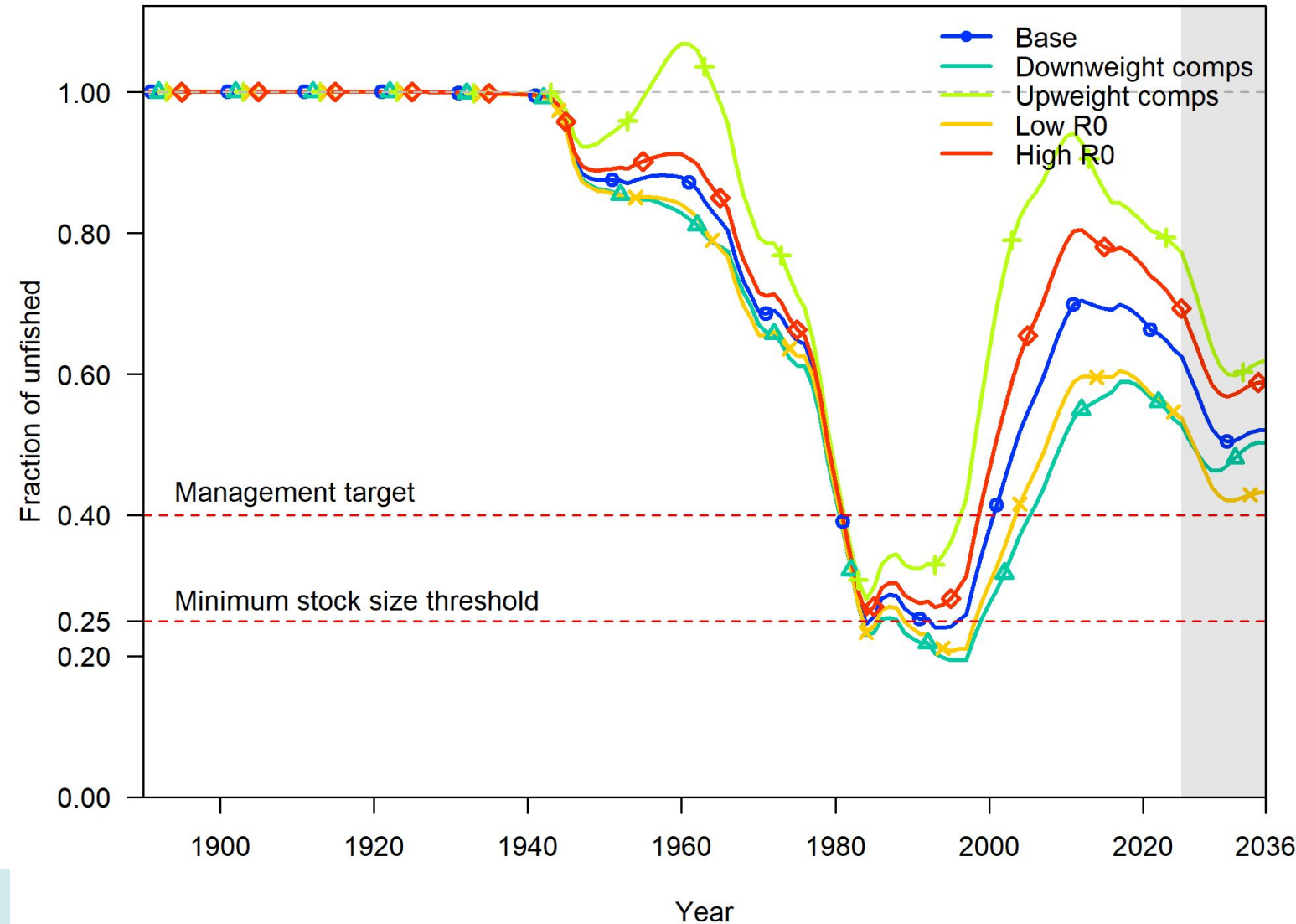
Range of 2025 OFL
based on assumed
category 1 sigma of 0.5,
low = 3061, high = 9669

Label	Base	M low	M high	R0 low	R0 high	Down-weight comps	Upweight comps
Diff. in likelihood from base model							
Total	0	1.7	1.84	1.22	0.92	-963.711	1260.87
Index	0	-1.025	2.418	-0.744	1.531	-5.772	7.13
Length comp	0	1.416	-1.217	0.986	-0.809	-275.869	533.677
Age comp	0	1.962	-1.154	1.578	-1.097	-672.632	712.662
Recruitment	0	-0.46	1.497	-0.425	1.098	-9.657	6.683
Parm priors	0	-0.188	0.312	-0.158	0.194	-0.145	0.46
Estimates of key parameters							
Recruitment unfished	36.63	27.665	50.233	28.282	46.63	30.312	60.869
log(R0)	10.509	10.228	10.824	10.25	10.75	10.319	11.017
M Female	0.157	0.14	0.175	0.144	0.169	0.145	0.182
M Male	0.136	0.122	0.151	0.125	0.146	0.126	0.158
L at Amax Female	52.9	52.9	53	52.9	53	52.9	52.5
L at Amax Male	47.9	47.9	48.0	47.9	48.0	47.9	47.5
Estimates of derived quantities							
Unfished age 4+ bio 1000 mt	135.0	127.7	147.3	124.4	147.5	130.8	158.7
B0 trillions of eggs	14.6	15.1	14.5	14.4	15.0	15.0	15.5
B2025 trillions of eggs	9.13	8.306	9.87	7.754	10.384	7.929	12.005
Fraction unfished 2025	0.626	0.551	0.682	0.538	0.693	0.527	0.773
Fishing intensity 2024	0.638	0.744	0.548	0.762	0.546	0.746	0.45
Catchability for WCGBTS	0.329	0.377	0.288	0.39	0.284	0.411	0.231
OFL mt 2025	5440	4388	6666	4223	6701	4391	8555

Request 13: Adding projections to 4 candidates



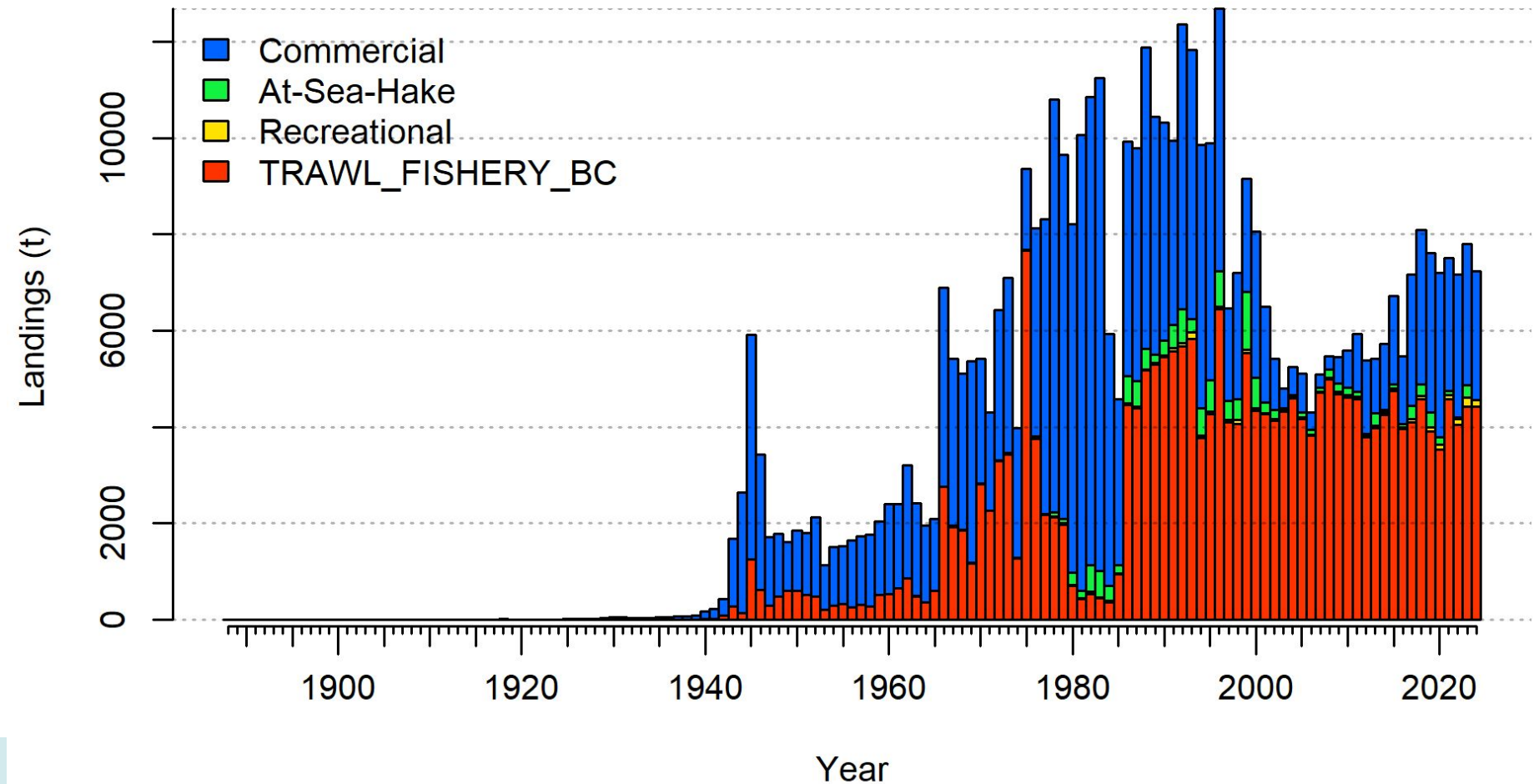
Request 13: Adding projections to 4 candidates



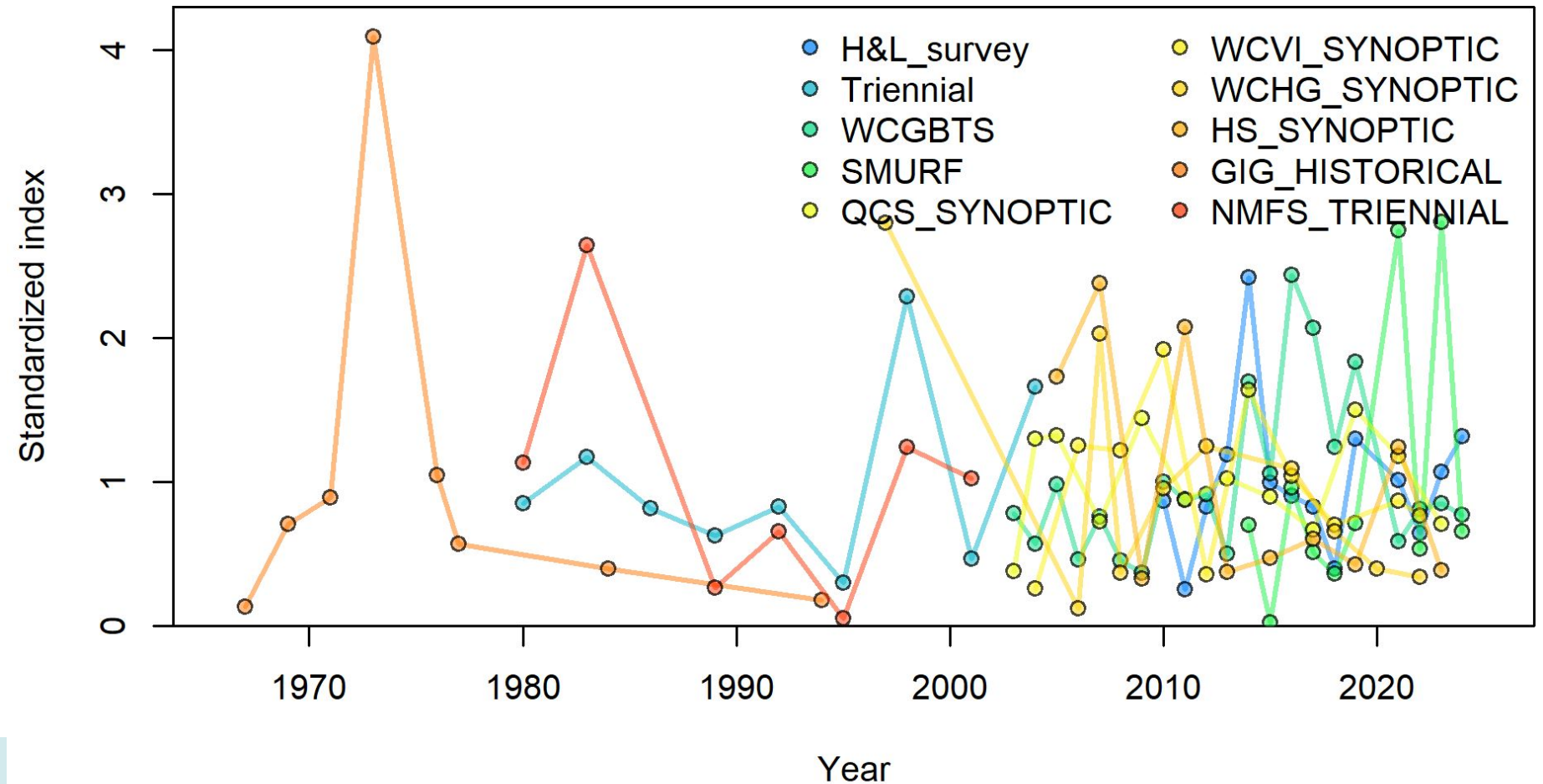
Bonus material: combined U.S. + Canada model

- Added all fleets from 2024 Canadian Yellowtail Rockfish assessment to U.S. model
- Canadian model includes age compositions and indices of abundance
- Two areas with estimated allocation of shared recruitment among areas (with or without variation over time in allocation)
- No movement between areas
- Use parametric growth setup from U.S. model and ignore empirical weight-at-age used in Canadian assessment
- Canadian model has separate design-based indices for each sub-area

Bonus material: combined U.S. + Canada model

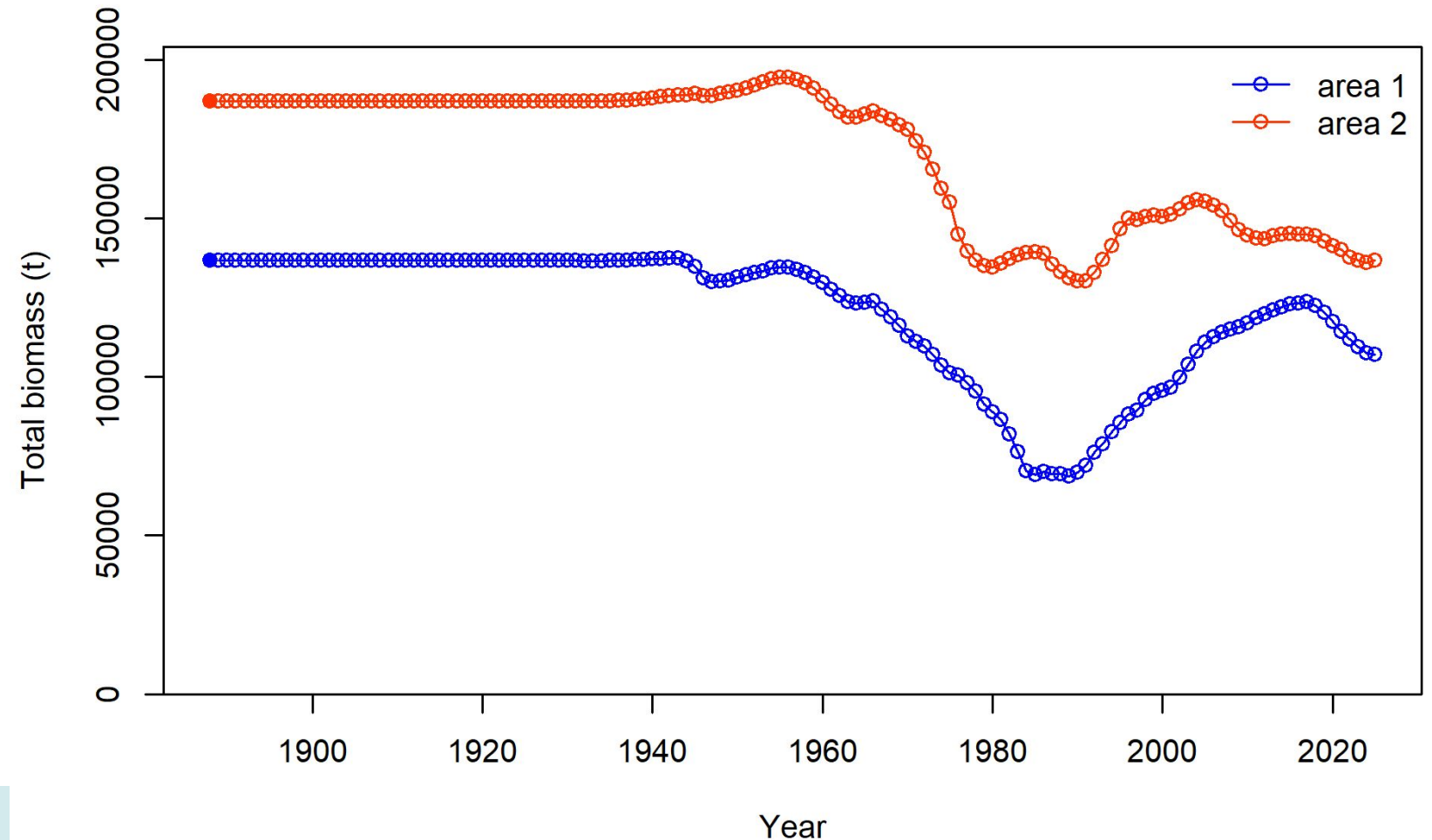


Bonus material: combined U.S. + Canada model



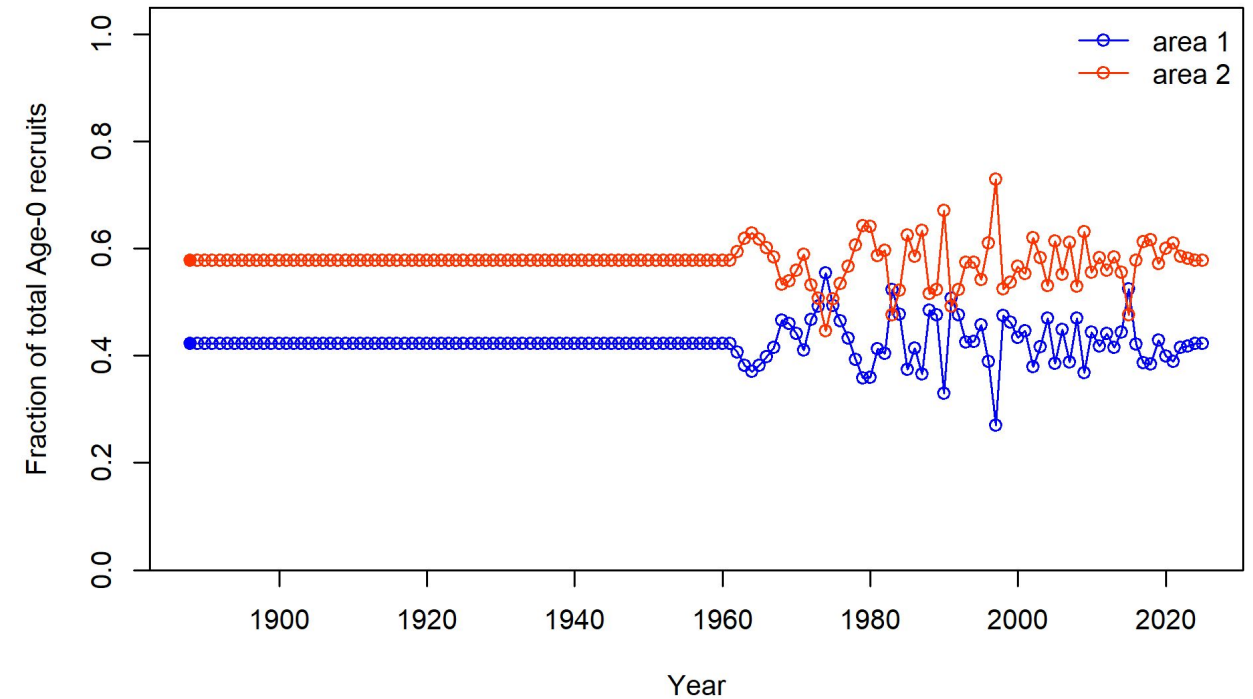
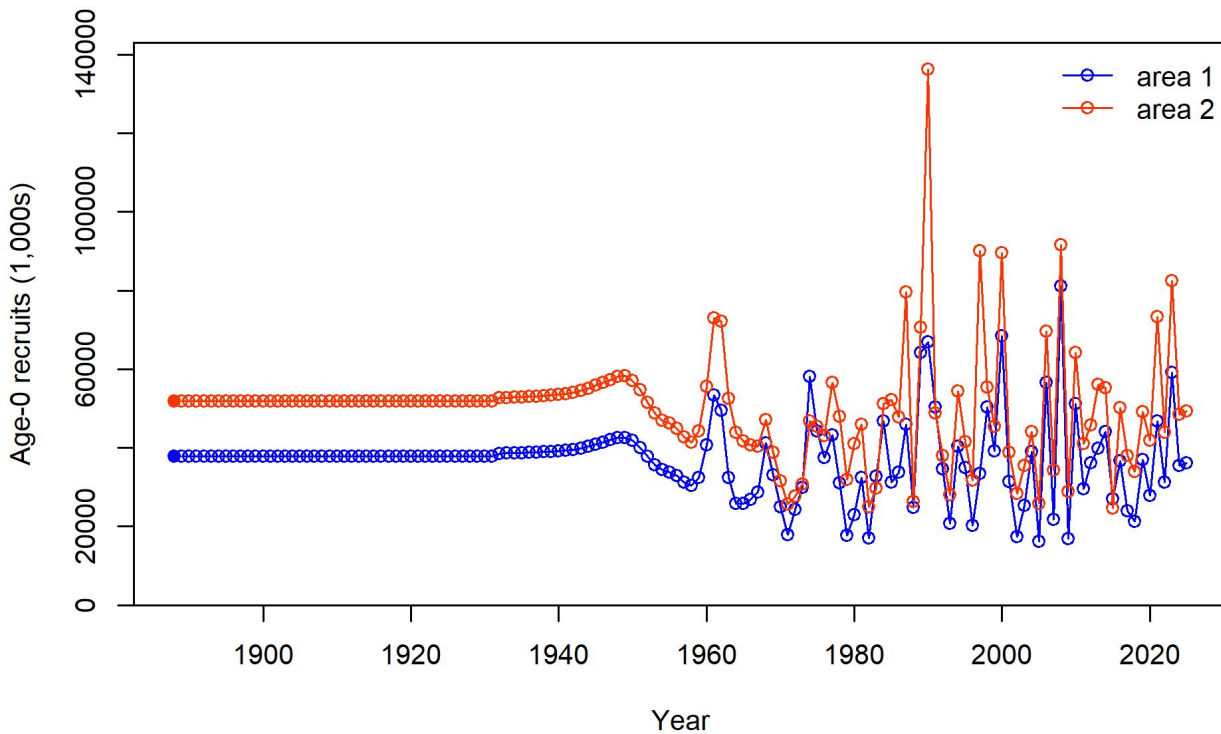
Bonus material: combined U.S. + Canada model

Area 1 = U.S., Area 2 = Canada

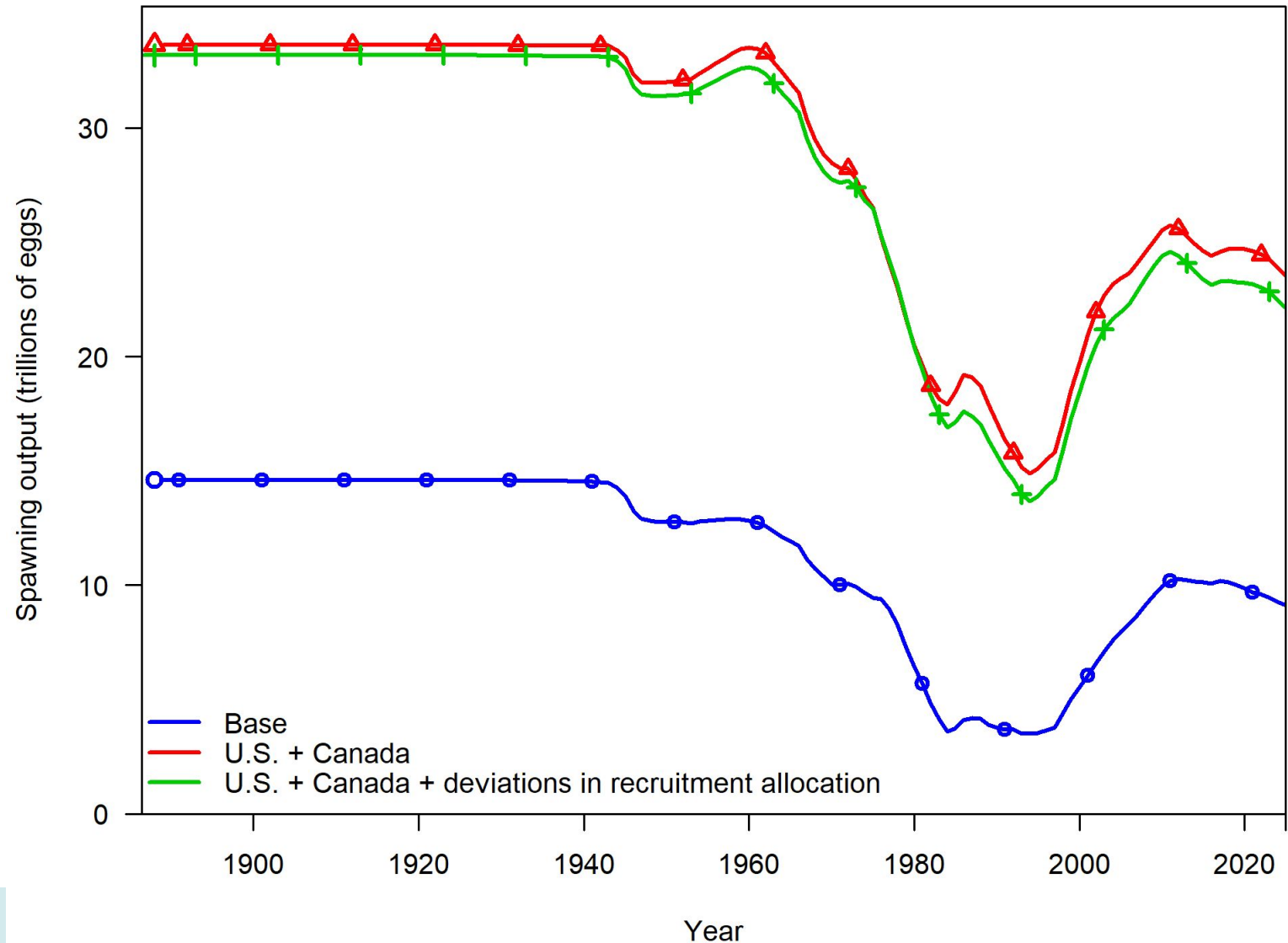


Bonus material: combined U.S. + Canada model

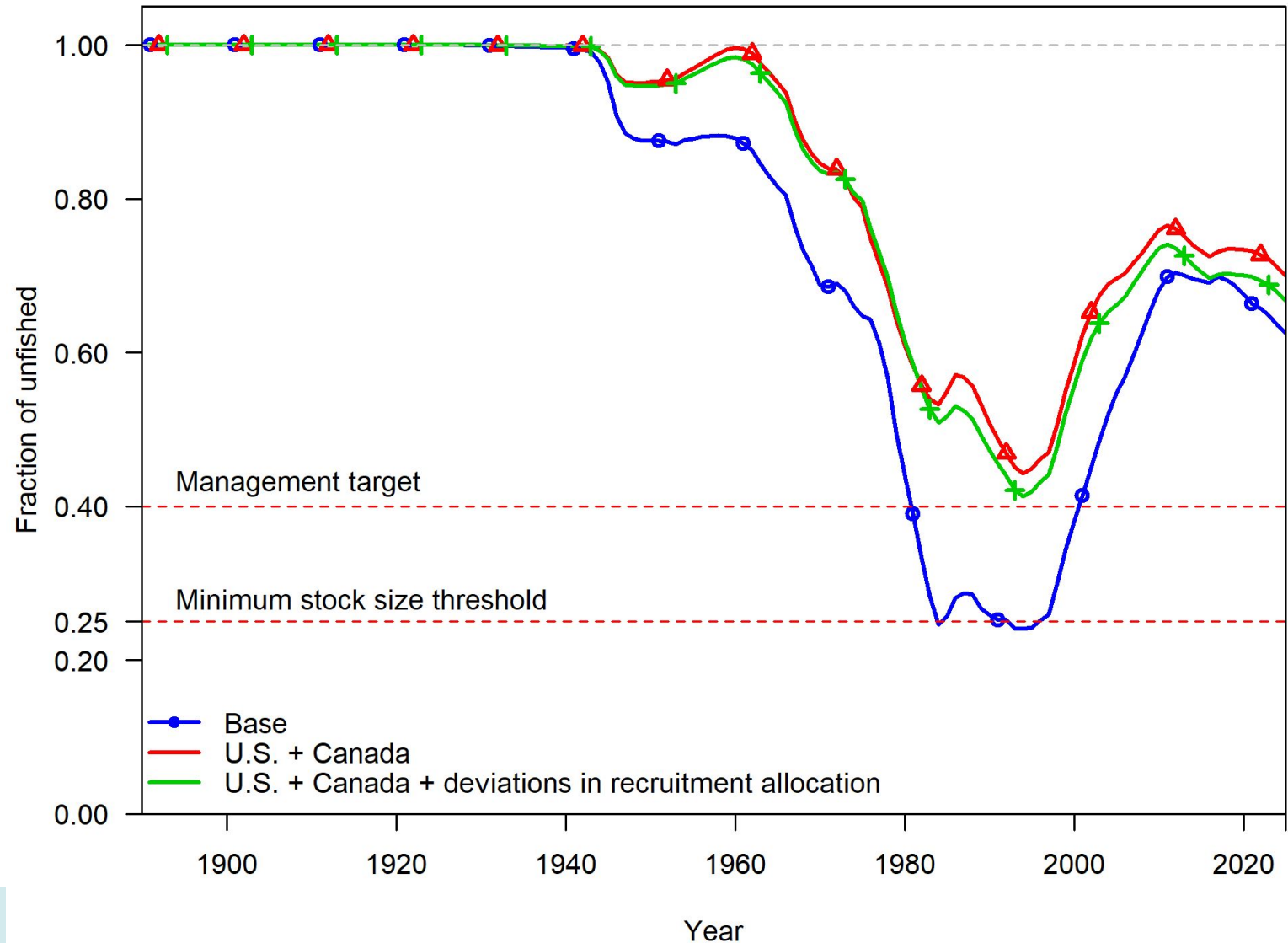
Deviations in recruitment allocation are relatively small



Bonus material: combined U.S. + Canada model

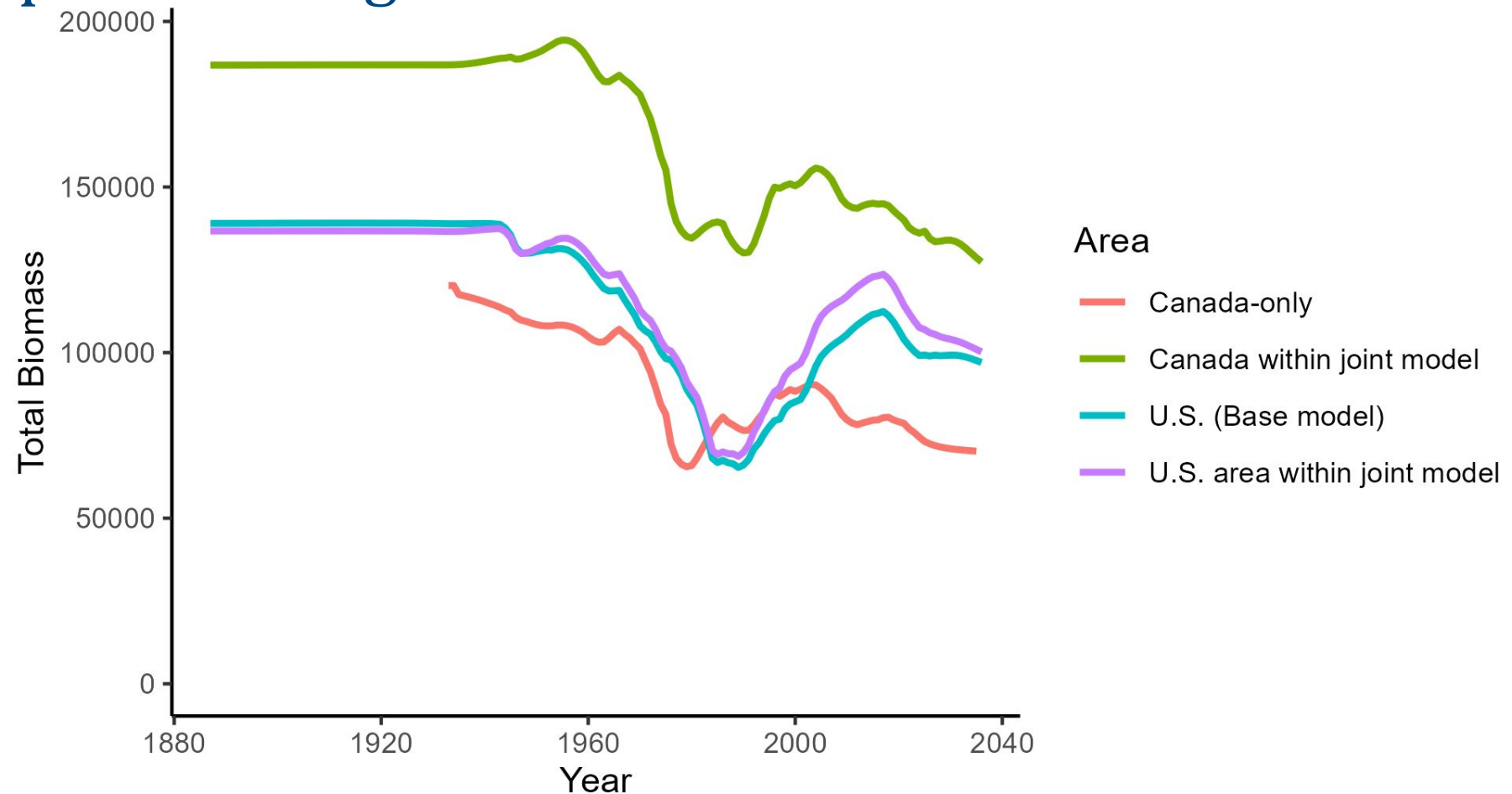


Bonus material: combined U.S. + Canada model



Bonus material: combined U.S. + Canada model

Unresolved issue of scale in Canadian area, perhaps related to weight-at-age vs parametric growth



Thank you!



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