



2025 Yellowtail Rockfish North of 40° 10' N. STAR presentation 4: Response to STAR requests from Day 2 Kiva L. Oken¹, Ian G. Taylor¹, Megan L. Feddern¹, Alison D. Whitman², Fabio P. Caltabellotta³

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Implement an alternative time blocking on selectivity for the commercial fleet with three time blocks; prior to 2002 (depending on shifts in composition observed) with asymptotic selectivity, 2002-2010 (with domed and asymptotic selectivity), and 2011 to present with asymptotic selectivity.

Rationale: The time blocking may improve the fit to the length and age composition data source over time. In 2002, the trawl Rockfish Conservation Areas (RCAs) were established off all three states (Washington, Oregon, and California). However, there were some allowances for midwater trawl vessels to fish within the "no trawl" Darkblotched Conservation Area (DBCA) for midwater rockfish such as yellowtail and widow. In 2011, the Individual Fishing Quota (IFQ) trawl fishery was established. This will also encompass the midwater rockfish trawl fishery that started to catch yellowtail in 2013 due to an increased widow rockfish ACL. This increase in yellowtail rockfish catch by commercial sector across time is shown in Figure 1.



• Improvement in fit is less with 2011 change vs 2017





Late correction

- The implementation of the dome-shaped selectivity was done incorrectly in requests 2 and 6 (the flat top was forced to be wide, preventing the model from estimating a dome)
- Initial exploration indicates that a corrected model for request 2 does estimate a dome in the middle block but has almost identical results otherwise because the dome occurs at a larger size than most of the observed catch



For the base model, reduce all composition weights by a large amount (e.g., 90%). Show model fits to indices and composition data, and spawning output and spawning depletion time series.

Rationale: Desire to explore potential conflicts between the indices and compositional data, and the impacts on quality of fit and stock trajectory.



Change is similar direction to "Upweight WCGBTS" sensitivity, but less extreme



Change is similar direction to "Upweight WCGBTS" sensitivity, but less extreme

















Triennial

WCGBTS



Table of values for requests 2, 6, and 7

Gray shaded boxes are not comparable because of changes in data weights

	Base	Request 2 blocks	Request 6 blocks	Downweight comps
Diff. in likelihood from base model				
Total	0	34.6	-48.6	-963.7
Index	0	-1.5	0.2	-5.8
Length comp	0	0.8	-14.4	-275.9
Age comp	0	36.2	-32.6	-672.6
Recruitment	0	-0.8	-1.8	-9.7
Parm priors	0	-0.1	-0.1	-0.1
Estimates of key parameters				
Recruitment unfished millions	36.6	33.5	32.8	30.3
log(R0)	10.5	10.4	10.4	10.3
M Female	0.157	0.152	0.152	0.145
M Male	0.136	0.131	0.132	0.126
L at Amax Female	52.9	52.9	53	52.9
L at Amax Male	47.9	47.9	48.0	47.9
Estimates of derived quantities				
Unfished age 4+ bio 1000 mt	135.0	132.4	128.0	130.8
B0 trillions of eggs	14.6	14.6	14.2	15.0
B2025 trillions of eggs	9.13	9.119	8.491	7.929
Fraction unfished 2025	0.626	0.625	0.599	0.527
Fishing intensity 2024	0.638	0.649	0.684	0.746
Catchability for WCGBTS	0.329	0.352	0.402	0.411

Request 7



Provide more information on the relative abundance in the WCGBTS by year north and south of the Columbia River.

Rationale: To begin an evaluation of variability in relative abundance across time in the respective strata given the apparent variation in distribution of the stock within the assessment area.



Survey index comparison between OR/WA





Survey index comparison between OR/WA: N/S Mendocino split



"For multi-region models, it wouldn't make sense to interpret indices other than the split used in the model" ~ index WC developers

catch_weight ~ 0 + fyear*split_mendocino + pass_scaled



Survey index comparison between OR/WA: state split



catch_weight ~ 0 + fyear*split_state + pass_scaled



Survey index comparison between OR/WA: state split



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Design-based index from day 1







Provide more information on the approaches used to develop a midwater (and other) commercial CPUE time series.

Rationale: The panel is seeking to explore the availability of alternative indices that may be more informative than the current fishery-independent indices.



CPUE index standardization

- Filtering:
 - $\circ~$ Midwater trawl gear code, average latitude north of 40-10 $\,$
 - Shoreside ITQ sector (100% observer or electronic monitoring coverage)
 - \circ >50% of landed catch is rockfish
 - Includes hauls targeting widow, canary, and yellowtail rockfish
 - Haul duration \in (0, 10) hours (excludes 22 hauls)
 - CPUE < 90 (excludes 3 hauls)
- CPUE: mt yellowtail per hour towed



Highly right-skewed distribution of CPUE from positive tows

- No additional filtering
 - 69.7% of 3,962 tows tows contain yellowtail
 - 2012-2023, 330 tows/year
 - \circ 878 trips on 46 vessels
- Comparison to trawl survey:
 - 222 tows/year north of 40-10 and shallower than 400m
 - habitat differences





Standardization model

• Terms:

- Year
- s(depth)
- s(Julian day)
- \circ $\,$ random effect for vessel ID $\,$
- EM vs observer data
- WA vs OR/CA (locations are not random, creating issues for fully spatiotemporal models)
- Delta-lognormal



Effect of depth







Presence model



200 = July 19 in non-leap year

Positive catch model





Resulting index





Vessels with at least 30 yellowtail hauls

• Reduced data set:

- 69.5% of 3,660 tows contain yellowtail (nearly identical % positive)
- 2012-2023, 305 tows/year
- \circ 749 trips on 24 vessels

• Terms:

- Year
- s(depth)
- s(Julian day, by = vessel ID)
- \circ $\,$ random intercept for vessel ID $\,$
- EM vs observer data
- \circ WA vs OR/CA



Only trips in WA

- Full set of vessels
- Terms:
 - Year
 - s(depth)
 - s(Julian day)
 - \circ $\,$ random effect for vessel ID $\,$
 - EM vs observer data



Only trips September - December

- Full set of vessels
- Terms:
 - Year
 - s(depth)
 - s(Julian day)
 - \circ random effect for vessel
 - EM vs observer data
 - WA vs OR/CA



Include flag before/after 2017

- Full set of vessels
- Terms:
 - $\circ~$ random effect for Year
 - s(depth)
 - s(Julian day)
 - \circ random effect for vessel
 - EM vs observer data
 - WA vs OR/CA
 - 2012-2016 vs 2017-2023



Comparing all indices





Thank you!



1-10

Survey index comparison between OR/WA: N/S Mendocino split



"For multi-region models, it wouldn't make sense to interpret indices other than the split used in the model" ~ index WC developers

catch_weight ~ 0 + fyear*split_mendocino + pass_scaled



Survey index comparison between OR/WA with mean 0 and sd of 1 by area



