Status of the Yellowtail rockfish stock off the U.S. West Coast north of 40°10′ in 2025

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0.1 Executive Summary

0.1.1 Assessment Model

0.1.2 Reference Points, Stock Status, and Projections

1 Introduction

Testing adding in an introduction for Yellowtail rockfish. There is currently no read of parameters for child documents.

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We used a total of 292 individual histological samples of aged female yellowtail rockfish to estimate maturity for the assessment. These samples were all collected north of 40.167; this latitude filter excluded 5 additional samples collected in the south, but the inclusion or exclusion of these samples did not change our results. The 292 samples were collected over the period 2016—2023, though more samples were collected earlier in these years (n = 111 in 2016, 52 in 2017, 31 in 2018, 17 in 2021, 9 in 2022, 13 in 2023). Previous assessments of yellowtail estimated length-based maturity (L50 = 42.49cm in 2017 assessment); however, we switched to an age based model for the current assessment. For many species, energy is reallocated toward maturation from growth, and as a result growth rates slow during the juvenile to adult transition period. Thus, length at 50% maturity will represent a range of ages, providing a less accurate understanding of the spawning population. We treated maturity as a binomial response, and considered a variety of models with temporal and spatial covariates, using a logit link and generalized linear mixed model framework, implemented the R package sdmTMB (Anderson et al. 2024). Briefly, we considered models that included (1) temporal year effects (either estimated as a random walk intercept, or smooth term), (2) spatial random fields (using a mesh cutoff distance of 50km), and (3) spatially varying coefficients of age, following the model adopted by Grandin et al. (2024). Models that converged were compared by examining QQ plots, AUC metrics, and AIC scores. Likely because of the uneven temporal distribution of sampling, and general sparsity, we did not find support for including temporal or spatial effects, and decided on the simpler null model (equivalent to a logistic regression). For the age-based model, we estimated an intercept of -6.70 (SE = 0.99) and slope of 0.67 (SE = 0.10), equivalent to an A50 of 13.31 years. For a more direct comparison to the previous assessment, we used these same 292 samples to fit an equivalent length – based model, which resulted in an estimated L50 = 43.35 cm.

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Anderson, Sean C., Eric J. Ward, Philina A. English, Lewis A. K. Barnett, and James T. Thorson. 2024. "sdmTMB: An r Package for Fast, Flexible, and User-Friendly Generalized Linear Mixed Effects Models with Spatial and Spatiotemporal Random Fields." *bioRxiv* 2022.03.24.485545. https://doi.org/10.1101/2022.03.24.485545.

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