



**NOAA
FISHERIES**

Status of Quillback Rockfish in U.S. Waters off California in 2025: GFSC Review Presentation

August 13, 2025

Stock Assessment Team:

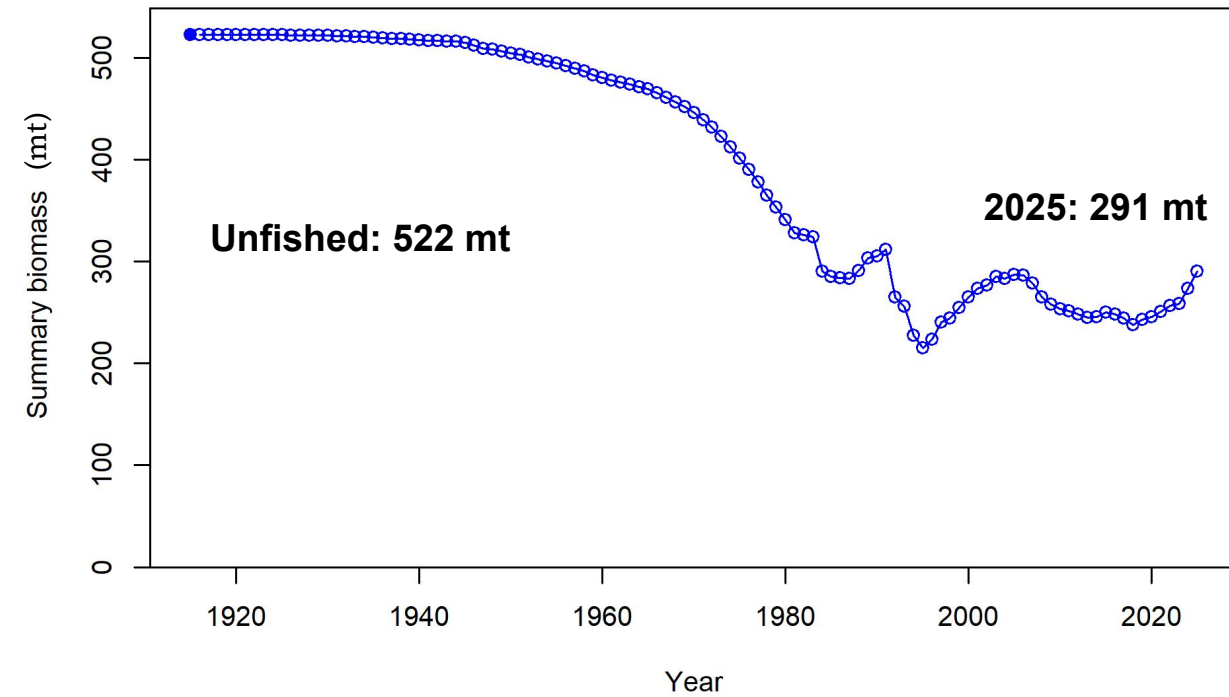
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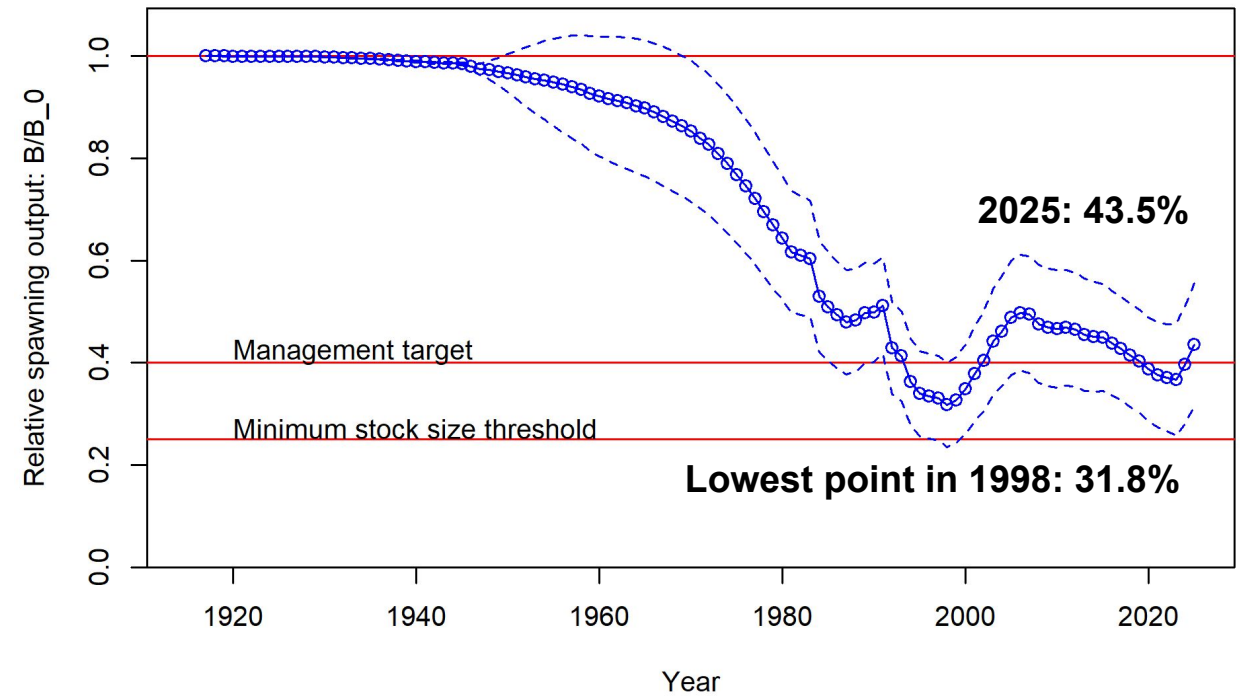
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Key assessment outputs

Summary (age 3+) biomass

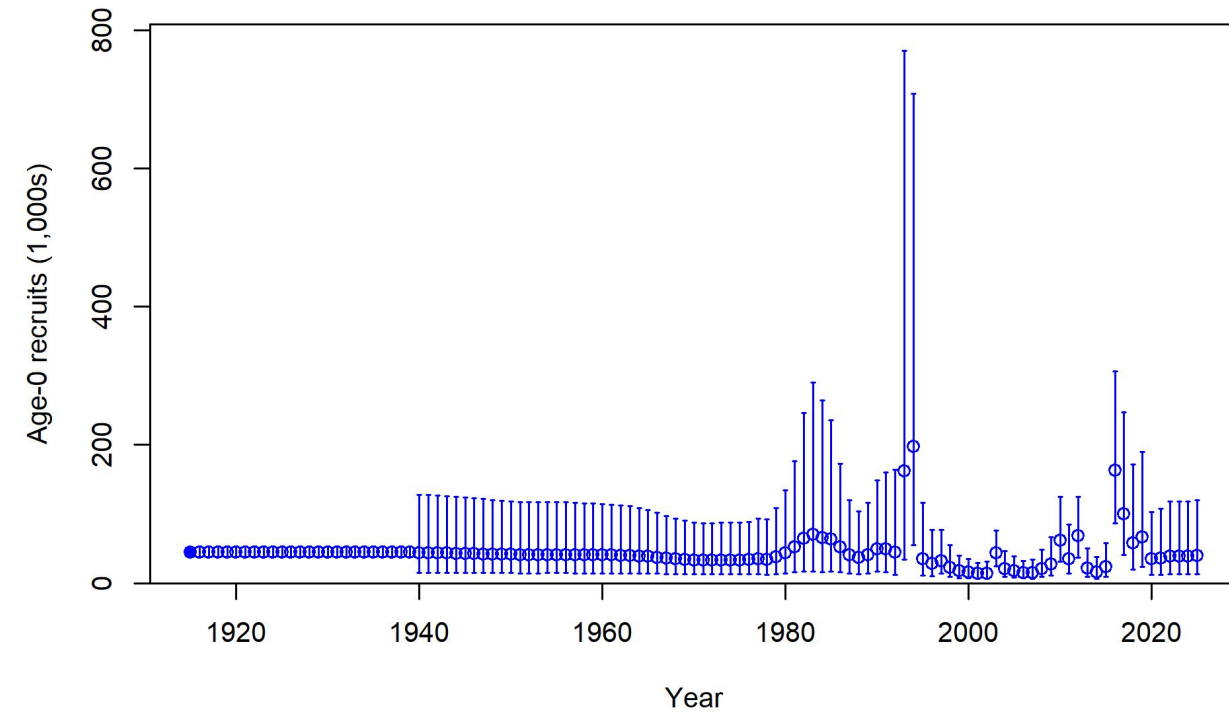


Fraction unfished

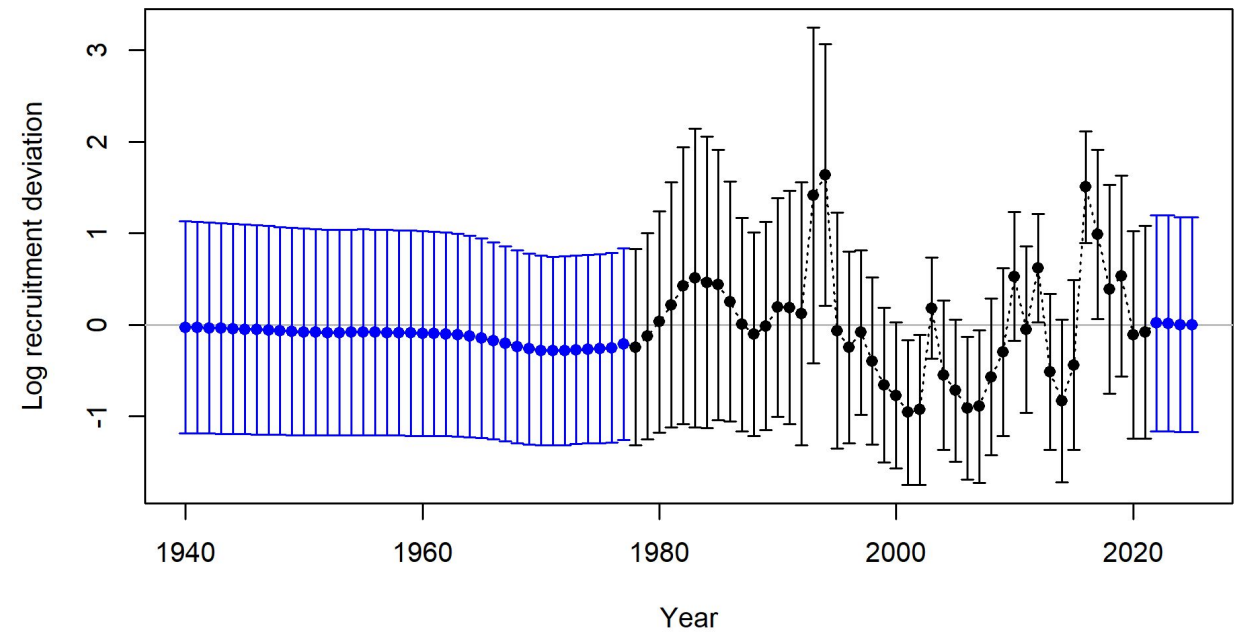


Key assessment outputs

Recruitment



Recruitment Deviations



Data and Model Structure

Catch fleets

1. Commercial fleet
 - a. Lengths, Age (CAAL)
 - b. Combined across gear and live/dead
2. Recreational fleet
 - a. Lengths, Index
 - b. Combined across modes

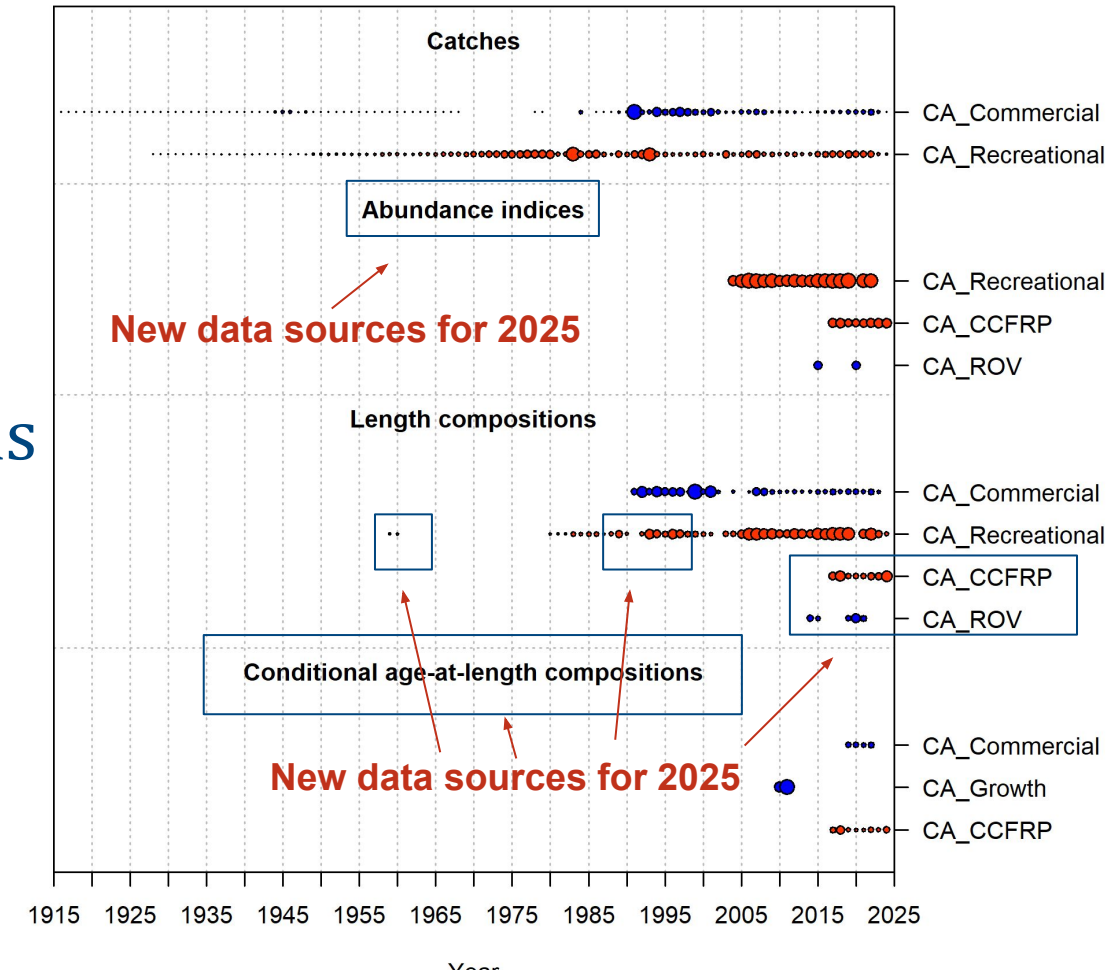
Survey fleets

3. Growth fleet
 - a. Age (CAAL)
4. California Collaborative Fisheries Research Program (CCFRP) fleet
 - a. Lengths, Age (CAAL), Index
5. CDFW ROV fleet
 - a. Lengths, Index

Model structure: Single sex and single area model. California only

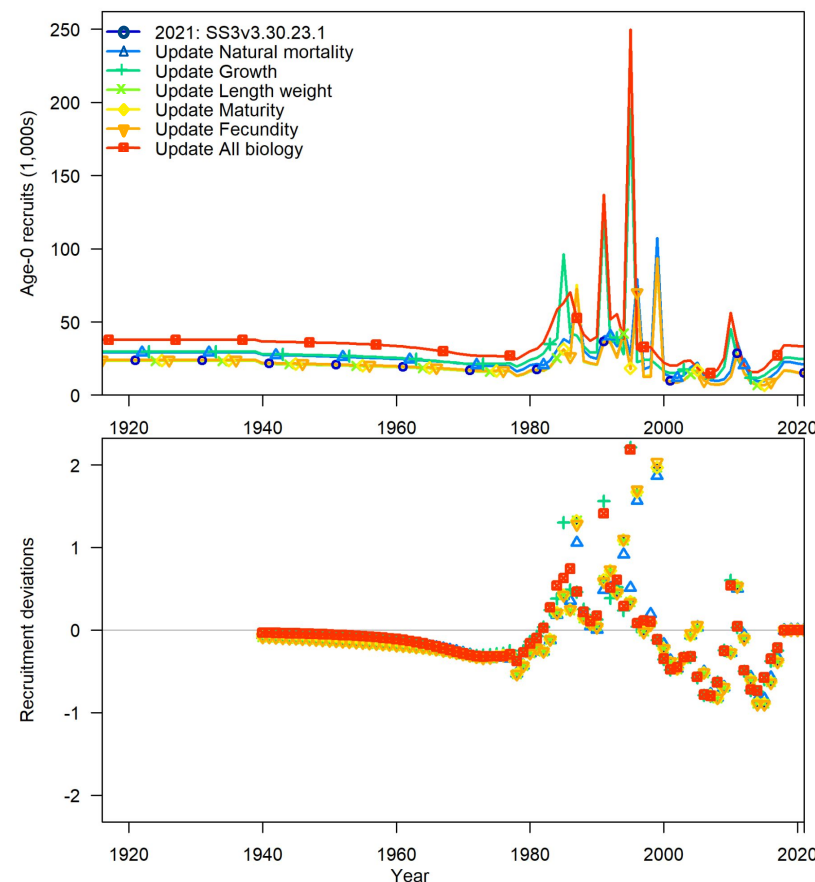
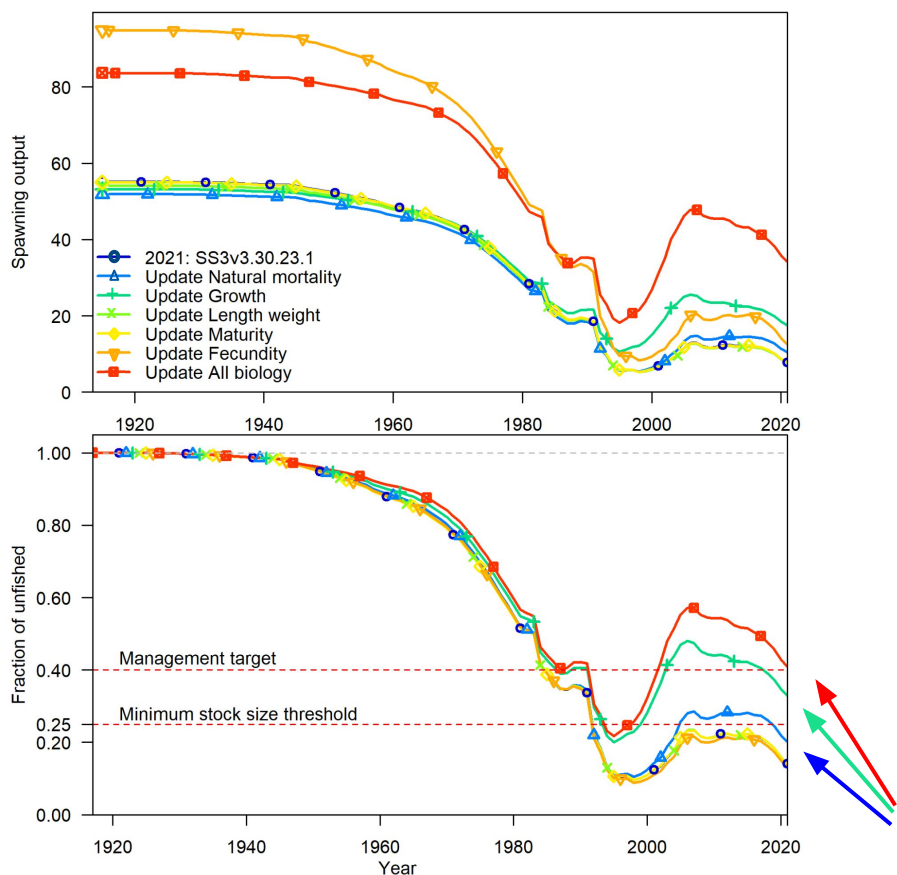
Summary of major changes from previous assessment

- Data**
- Added data in years 2021-2024
 - Reanalyzed inputs from raw data
 - Updated biological relationships
 - Include new sources of length data
 - Include commercial age compositions
 - Include fleet to estimate growth
 - Include survey fleets (CCFRP & ROV)
 - Include CCFRP age compositions
- Structure**
- Used asymptotic and domed-shaped selectivity and blocks



Abbreviated bridging plot(s)

- Changes to productivity (growth, natural mortality) were key drivers in change from 2021 assessment

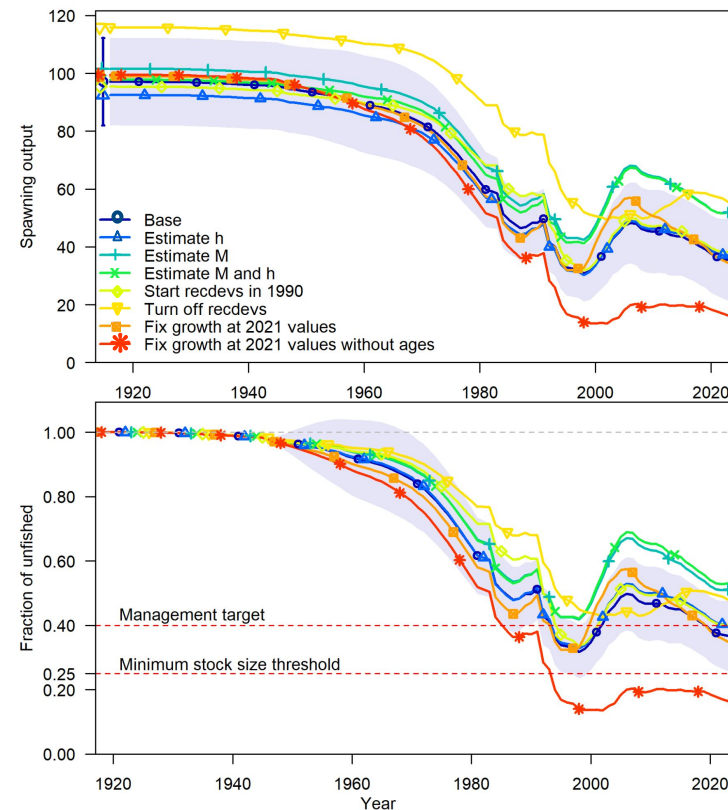
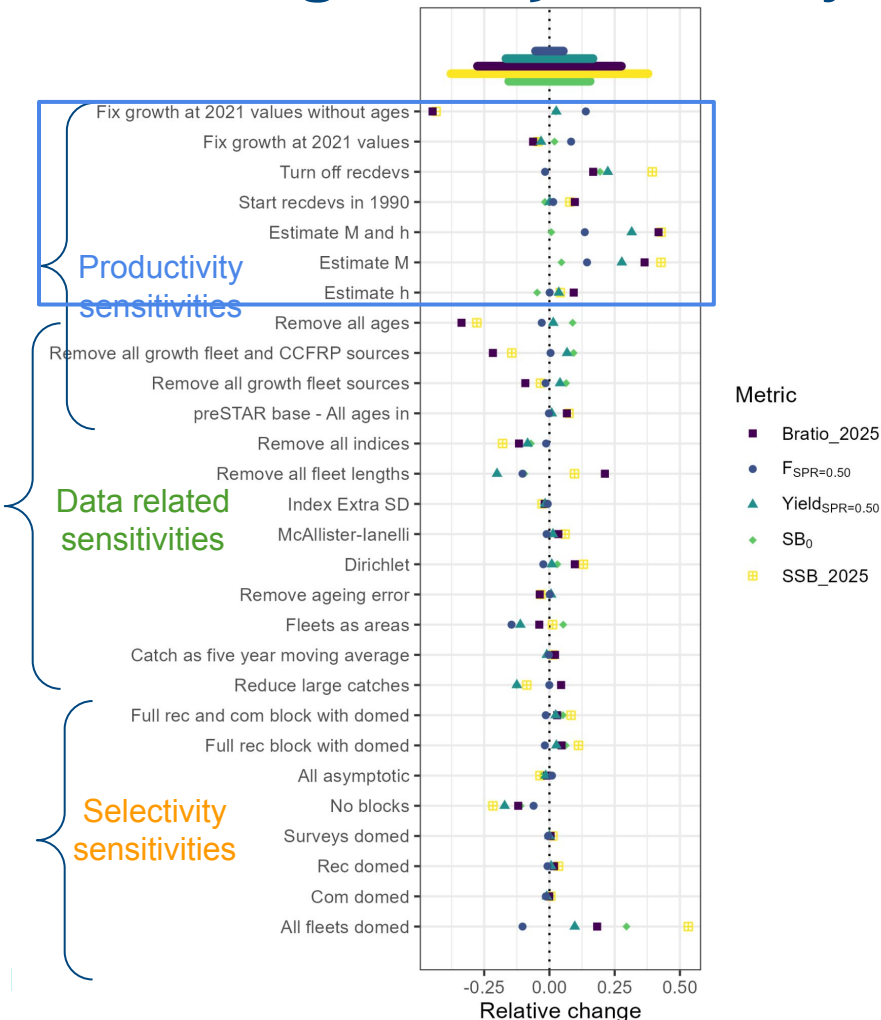


Recruitment
coalesced into
fewer year classes
with changes in
growth

Changes in growth, and M led to increase in fraction of unfished, especially when combined in All biology

Major uncertainties highlighted by the STAT

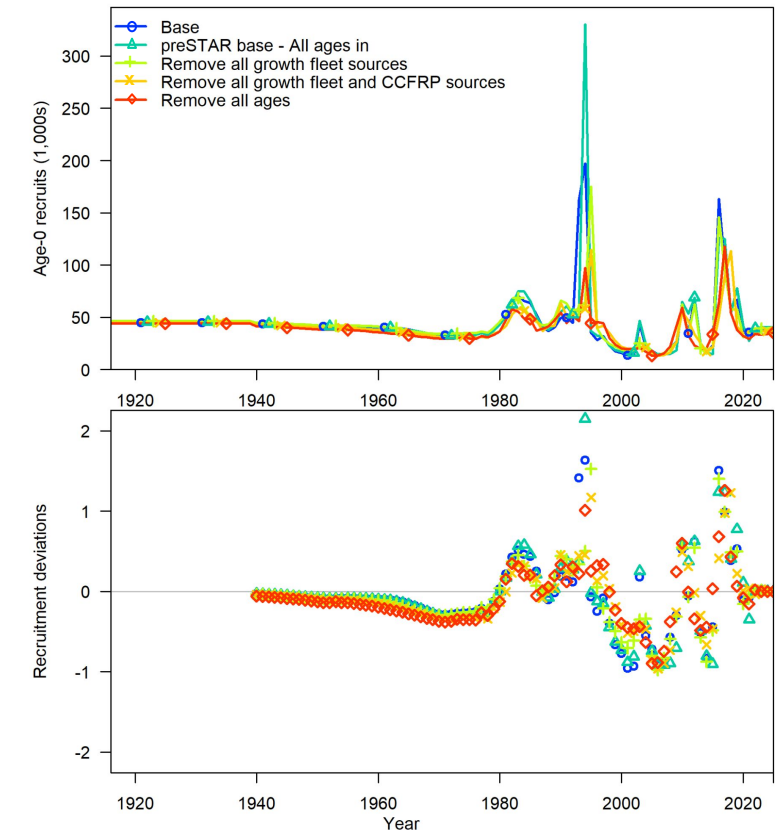
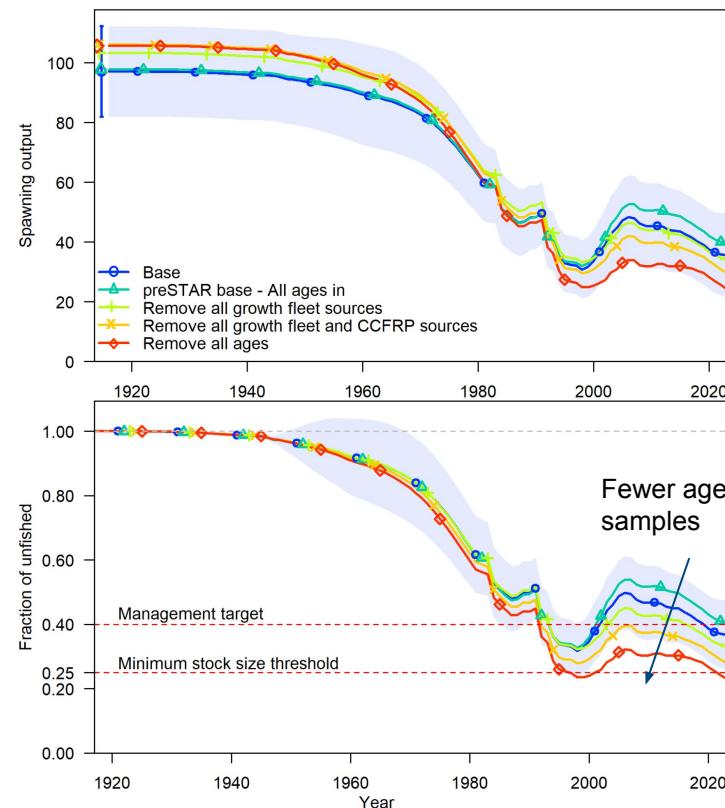
- Assumptions around productivity (natural mortality and use of age data) were key uncertainties within 2025 assessment



Estimating M increases recent scale (more so than steepness)

Major uncertainties highlighted by the STAT

- Assumptions around productivity (natural mortality and use of age data) were key uncertainties within 2025 assessment



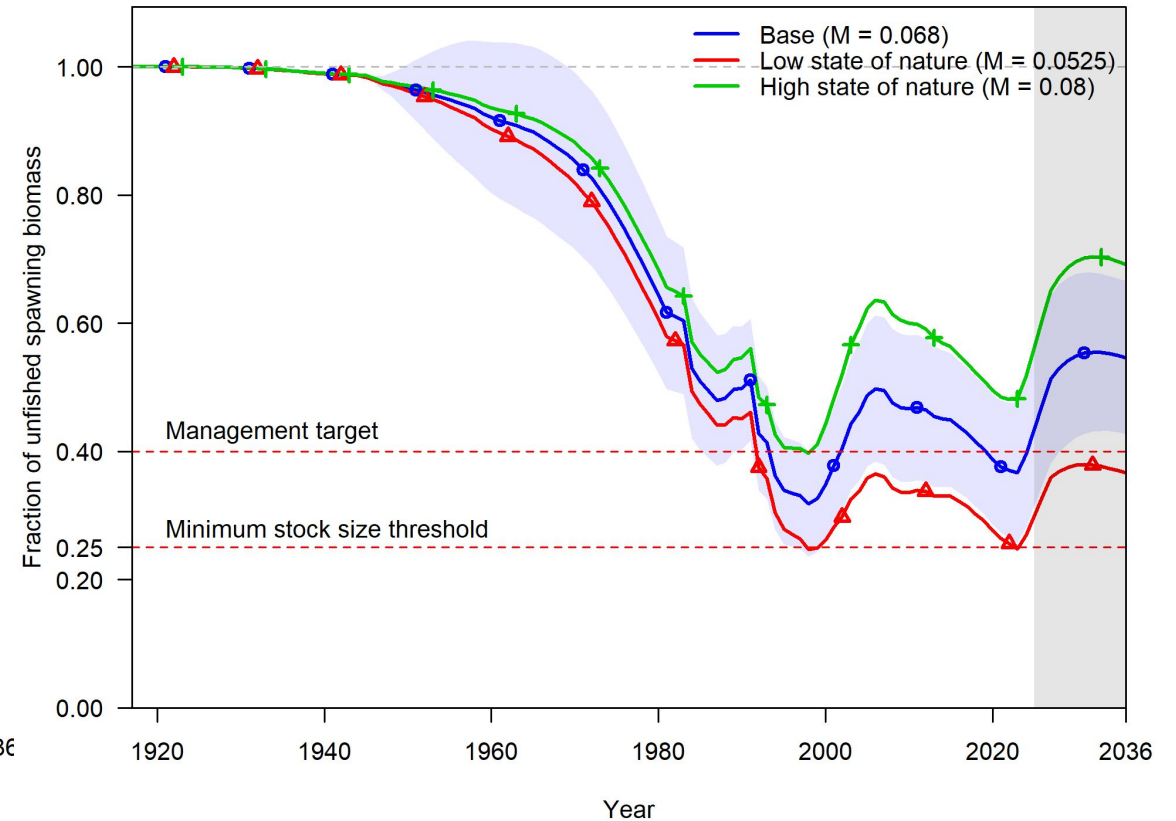
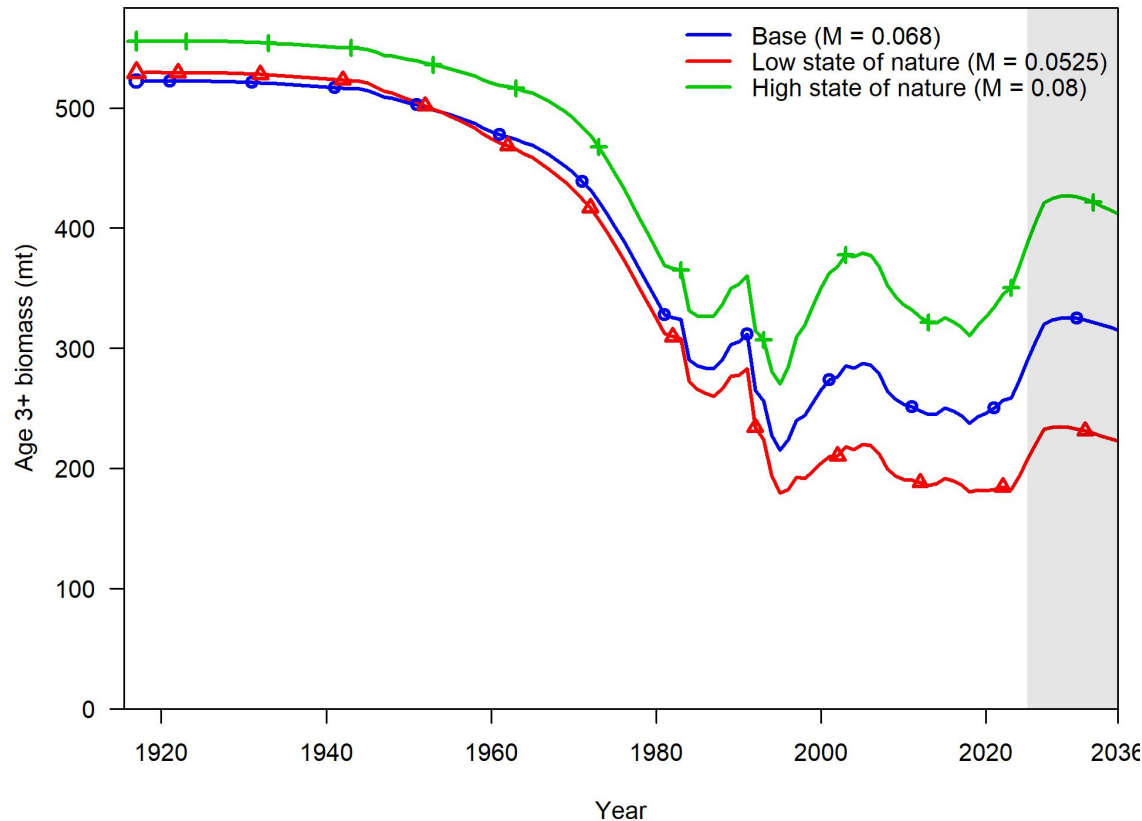
Successively removing age data lead to weaker recruitment signal and less optimistic estimates of population size and status

Major elements highlighted by the STAT

- Changes to productivity (growth, natural mortality) were key drivers in change from 2021 assessment
- Assumptions around productivity (natural mortality and use of age data) were key uncertainties within 2025 assessment
- Indices had limited influence on population trajectory
- Areas-as-fleets explored, did not alter conclusion about trajectory
- Age data are informative: How to incorporate age data that are not from standard sampling efforts of modeled fleets (e.g. use as growth fleet) into model?
 - 61% of available ages for growth fleet not included

Axis of uncertainty / states of nature

- Primary axis of uncertainty is natural mortality (M)
 - Low ($M = 0.0525$) and high ($M = 0.08$) state selected based on 75% CI of OFL in 2025 from base model



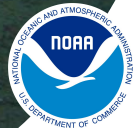
Risk Table

Table ix: Risk Table for California quillback rockfish to document ecosystem and environmental factors, as well as data driven factors potentially affecting stock productivity and uncertainty or other concerns arising from the stock assessment. Level 1 is a favorable ranking, Level 2 neutral, and Level 3 unfavorable.

Ecosystem and environmental conditions	Assessment data inputs	Assessment model fits and structural uncertainty
There is limited information on factors affecting quillback recruitment, habitat, prey and predators, and competitors.	- Catch reconstruction has uncertainty in some historical years due to periods of high and low estimates of sampled catch rates and when rockfish were not always sorted to species - Not captured in bottom trawl surveys. Indices based on fishery-dependent and other fishery-independent sources. Limited effect on population trends. - Age data is limited compared to some other groundfish species and primarily occurs in the most recent 5-10 years. Covers commercial sector and suitable for growth estimation. Young fish remain sparse. - Fewer samples of length data from fishing in recent years due to non-retention - Length and age data are generally fit well across many assumptions. - Species-specific maturity and fecundity with both being collected from most recent years - Generally not a directly targeted species but most catch is landed.	- Recruitment and growth are estimated internally whereas natural mortality and steepness are based on priors. - Profiles and jitters indicate the model is stable and that estimated parameters are generally well estimated. - Uncertainty in natural mortality estimates both in terms of uncertainty in longevity as well as limited information by which to clearly estimate value. - Uncertainty in recruitment, particularly the strength of recruitment deviations in the mid 1990s. - Patterns of retrospective bias due to exclusion of age data over time. - Composition and index data were generally well fit. - Data were insufficient to evaluate spatiotemporal variation in biology.
Level is Unknown	Level 3: Unfavorable	Level 2: Neutral

Thank you!

Photo Credit:
CDFW ROV



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Biological changes from previous assessment

Data or Parameter	2021 length-based data moderate		2025 benchmark	
Maximum age and natural mortality (M)	Fixed	$M = 0.057 \text{ yr}^{-1}$ (95 years) sd = 0.438	Fixed	$M = 0.068 \text{ yr}^{-1}$ (80 years) sd = 0.310
Steepness	Fixed	$h = 0.72$	Fixed	$h = 0.72$
Growth	Fixed single-sex OR/WA/CA data	$L_{\text{age} = 1} = 8.23 \text{ cm}$ (CV = 0.1) $L_{\text{age max}} = 43.04 \text{ cm}$ (CV = 0.1) $K = 0.199$	Estimated single-sex CA data	$L_{\text{age} = 1} = 9.35 \text{ cm}$ (CV = 0.18) $L_{\text{age max}} = 42.82 \text{ cm}$ (CV = 0.09) $K = 0.127$
Maturity	Fixed OR/WA data	$L_{50\%} = 29.23 \text{ cm}$ slope = -0.80	Fixed CA data	$L_{50\%} = 28.96 \text{ cm}$ slope = -0.606
Fecundity	Fixed Dick et al. 2017	$a = 3.93\text{e-}7$ $b = 3.702$	Fixed CA data	$a = 4.216\text{e-}8$ $b = 4.44$
Length-weight	Fixed OR/WA/CA data	$a = 1.963\text{e-}5$ $b = 3.016$	Fixed CA data	$a = 1.578\text{e-}5$ $b = 3.080$

Grey color means values unchanged

Data/structural changes from previous assessment

Data or Parameter	2021 length-based data moderate		2025 benchmark	
Fishing fleets	Two	1 recreational 1 commercial	Two	1 recreational (added index) 1 commercial
Survey fleets	None		Two	CDFW ROV (index + lengths) CCFRP (index + lengths + ages)
Selectivity	Asymptotic		Asymptotic and domed	Survey fleets: asymptotic Recreational: asymptotic Commercial: asymptotic and domed
Time blocks	None		Fishery fleets	Recreational: 1916-2016, 2017-2024 Commercial: 1916-2002, 2003-2013*, 2014-2021, 2022-2024*
Lengths and ages	Lengths only		Lengths and ages	Added: Survey fleet lengths + CCFRP ages Commercial ages Growth fleet ages *Mirrored selectivity

Grey color means values unchanged