Report of the Pre-Assessment Workshop for the 2025 Groundfish Stock Assessment of Sablefish and Rougheye/Blackspotted Rockfish

Pacific Fishery Management Council
Online Meeting

March 18, 2025

Summary

A pre-assessment workshop for the upcoming sablefish and rougheye/blackspotted rockfish assessments was convened via webinar on March 18, 2025. The overarching goal of the workshop was to promote a shared understanding about the best available data, analytical techniques, and modeling approaches for each stock assessment, including how the stock assessment teams (STATs) are considering the uncertainties and recommendations from previous assessment reviews.

Specific workshop objectives were to:

1) review and critically evaluate proposed data sources for each stock assessment,
2) discuss planned modeling approaches, and
3) solicit input from data stewards, stakeholders, and resource managers.

The sablefish STAT includes Chantel Wetzel, Aaron Berger, and Nick Tolimieri (Northwest Fisheries Science Center [NWFSC], NOAA), Joshua Zahner (University of Alaska Fairbanks), and Cheryl Barnes (Oregon State University). The rougheye/blackspotted rockfish STAT includes Jason Cope, Vlada Gertseva, and Claire Rosemond (Northwest Fisheries Science Center, NOAA), Alison Whitman (ODFW), and Fabio Caltabellotta (WDFW). John Field (Scientific and Statistical Committee [SSC], Pacific Fishery Management Council [PFMC]) is serving as chair of the stock assessment review (STAR) Panel and Chris Free (SSC) will serve as a STAR Panel reviewer, which is scheduled for 14-18 July 2025 in Seattle, WA. Whitney Roberts is the Groundfish Management Team (GMT) representative and Gerry Richter is the Groundfish Advisory Subpanel (GAP) representative for the STAR panel.

Sablefish

The STAT provided an overview of sablefish biology, available data, previous stock assessments, and initial modeling approaches for the upcoming assessment. The most recent benchmark stock assessment for sablefish was conducted in 2019, and a "limited scope" update assessment was conducted in 2023. As the question of stock structure and transboundary issues has long been a key uncertainty for this assessment, the STAT reviewed extensive information regarding stock structure, life history patterns, and movement rates. Their review indicates that there is no genetic evidence of population structure, but evidence for a single panmictic group of sablefish from the US West Coast to Alaska. Their analysis of movement rates (from tagging studies) suggests low movement rates between the US West Coast and British Columbia to the

north and greater movement rates among other areas of the Northeast Pacific. The STAT also reviewed results on differences in growth rates and other life history traits, noting that growth can vary considerably throughout the Northeast Pacific, including within the West Coast region, where slower growth to a smaller asymptotic size occurs south of approximately 36° N. latitude. With respect to recruitment, the STAT noted that over the past ten years there have been several strong recruitment events in all three areas that have led to sharp, recent population increases. Based on their review, the STAT suggested that the US West Coast area for sablefish is probably best considered a sub-stock, although the STAT team will continue to utilize the PFMC coastwide (US West Coast) stock delineation for purposes of the 2025 stock assessment model. There were some questions raised regarding the abundance of sablefish off of Mexico, as some landings are made and fish are known to be present off of Baja California. However, very little data are available to inform abundance in that region, and there is no evidence or knowledge of considerable movement or interaction between sablefish in US and Mexico waters.

With respect to the anticipated structure for available data and the model, the STAT anticipates a model that includes three fleets for commercial fisheries: trawl, hook-and-line, and pot gear, recognizing that the hook-and-line fleet may be combined with the pot fleet, but separately evaluating the two major fixed gear types could be helpful. The STAT reported that historical landings have not substantively changed and that recreational catches are typically very low relative to commercial catches, although there have been some increased bag limits in Oregon that may allow for an increased trend in recreational catches. With respect to how gear assignments are attributed to catch, the STAT noted that such assignments were based on fish tickets reported gear type, not the associated catch-share or allocation program that represents the quota share that the catch may have been landed under. There is some recognition that subtleties in size structure or discard practices among gear types can be important considerations for the catch share program. The STAT intends to more closely review the evolution of discard practices by linking the size and age structures from landings to the size and age structures from discards recorded by onboard observers. As with past assessments, there will be an assumption of 50% discard mortality for trawl-caught fish and 20% mortality for fixed gear (hook-and-line and pot gear), with rates from the Groundfish Expanded Mortality Multi-year (GEMM) data product (2019 onward). In the 2019 benchmark assessment, length frequency data from discards had an unusually strong influence on scaling the model and some of the technical adjustments used in that assessment were not considered ideal. These issues will be reevaluated for the upcoming benchmark, with greater exploration of time-blocks and other potential solutions. Other factors that may impact discard rate estimates were also discussed.

A large number of age estimates from structures collected between 1986-2000 should be available that were not used in previous assessments. The STAT noted that age and length data for fixed gear fleets are very sparse for Southern California fisheries, as samples were not collected. The STAT provided an overview of how demographic compositions of sablefish vary by depth and region, and that fish in deeper water may be older but not necessarily larger. The possibility that compositional data too strongly associate larger fish as older fish was discussed, noting that sablefish tend to grow very quickly to asymptotic size, but that size may be dictated in part on habitat (e.g., faster growth and larger asymptotic size north of 36°N). There was

discussion of some pilot/experimental sablefish fisheries in 1976 and 1983 in deep waters off of La Jolla, CA, in which fairly large fish were encountered, and that the Newport, CA dory fleet has landed sablefish from nearshore canyons off southern California for a very long time (despite being relatively modest in scale). The question of how bottom trawl survey practices may have changed in response to area closures resulting from fiber-optic cable deployments was discussed, and other challenges associated with separating fleets by states were discussed in detail.

There was discussion about the environmental index (i.e., sea level) used in the last model to help inform recruitment. More recent modeling work has evaluated a suite of oceanographic variables, and the upcoming model may include more mechanistic indicators. The STAT has also been considering alternative approaches to account for differences in growth or other life history traits (e.g., maturity) within a coastwide model, recognizing that a single curve may not fully capture the nuanced biology of this stock throughout the assessment area. Data suggest that sablefish mature at younger ages in the north, such that sablefish tend to mature at considerably older ages in southern areas (particularly south of 36° N. lat.), with more variable maturity rates by age. The STAT proposes to address these issues by pooling spatially-explicit estimates of biomass and developing a biomass-weighted maturity curve. Similar approaches are likely to be used for modeling growth (e.g., biomass-weighted empirical weight-at-age). The STAT also plans to explore the use of empirical weight-at-age data to circumvent the need to better capture annual variability in growth without adding parameters due to internal estimation. This has also been done in the Pacific hake assessment and could provide a better basis for exploring the potential impacts of density-dependent growth and weight-at-age during periods with extraordinarily strong recruitment. There was some discussion about what the right window for maximum age (to inform natural mortality estimates) might be in the face of ontogenetic movement patterns, recognizing as well that age data do not start until 1986 and there were already impacts on age structure from fishing in that time period. The STAT stated that although some Fourier transformed near-infrared spectroscopy (FT-NIRS) age estimates exist, they are likely to be used as a sensitivity, rather than within the base model.

Rougheye/blackspotted rockfishes

The STAT provided an overview of the current stock assessment for rougheye/blackspotted rockfish, the data available at the time of the workshop, and model specifications being considered for use in the 2025 assessment. This included an initial bridging analysis and description of unresolved issues, including the need to assess these two species as a complex, consistent with the last assessment. Rougheye and blackspotted rockfishes are genetically distinct but difficult to visually distinguish, such that landings and most other data are not available at the species level. The ranges of both species extend from northern California through Alaska, and results of stock assessments from British Columbia and the Gulf of Alaska were discussed. Rougheye rockfish appear to be more common than blackspotted rockfish along the US West Coast, though there may be hotspots within the assessment area where one or the other is more frequently encountered. Blackspotted rockfish are more likely to be mis-identified as rougheye rockfish rather than the other way around.

The STAT discussed information related to stock structure, conveying that the 2025 stock assessment will proceed with a single coastwide model. This model will involve a two-sex configuration that will increase flexibility relative to the single sex model used in the 2013 assessment, allowing for potential differences in growth, natural mortality, and other important life history traits. The proposed fleet structure consists of: 1) commercial trawl, 2) commercial fixed gear, 3) at-sea hake bycatch, 4) dead discard trawl, and 5) dead discard non-trawl fisheries. Treating trawl and non-trawl discards separately disentangles landings data, selectivity, and varied sampling methodologies. A sensitivity analysis showed no effect of separating discards when compared to the 2013 model treatment using a retention curve. All fleets will rely on length-based selectivity.

Commercial landings and biological compositional data represent the primary source of information for the rougheye/blackspotted rockfish assessment. Length compositions for all fleets (trawl: 1991-current; non-trawl: 1996-current; at-sea hake: 2000-current). Recreational data are limited given the deeper slope habitats used by this complex. It was noted that the at-sea hake (Pacific whiting) fishery started in the 1960s but did not appear to comprise substantial catches of rougheye/blackspotted rockfish until the late 1990s. For California, it was noted that not all non-trawl landings were included in the 2013 assessment, and there seemed to be an unusual spike in gillnet landings for central California ports. For Oregon, there were some changes in catches between 1987 and 1999 due to ongoing improvements in historical landings estimates. The Washington catch reconstruction has been the focus of new analyses and differs from the 2013 assessment, though documentation regarding these changes has not yet been provided. A comparison of total removals shows that removals have changed only modestly from the 2013 stock assessment, with some influence on preliminary model results.

Length data typically go back to the 1990s for trawl- and non-trawl (landed) fisheries and the early 2000s for the hake fishery. Retention is generally high; the Pikitch discard study conducted in the 1980s indicated that less than 1% of historical catch was discarded. There was some discussion of the best estimates to use for trawl and non-trawl discards for 2024, and some general agreement that they are likely similar to recent years. However, lower sablefish prices may increase the desire to keep and land more rougheye/blackspotted rockfish relative to earlier time periods. Discard length data seem to suggest a shift to smaller discards around 2011, and there was some discussion that this may be a logical place for a time block for discard length compositions. It was noted that the earliest years of discard length data (i.e., 2002 and 2003) were not collected randomly and will not be used.

Data from all of the surveys used in the 2013 assessment are anticipated to be used in the 2025 assessment (Alaska Fishery Science Center [AFSC] slope, NWFSC slope, triennial shelf-slope, and West Coast Groundfish Bottom Trawl [WCGBT] surveys), with only the WCGBTS having new information in the form of an extended time series. As rougheye/blackspotted rockfish are generally associated with deeper, high relief habitats, they are not always well represented within trawls surveys. For this reason, dome-shaped selectivity is likely to be used for most surveys and fleets for this stock. Within surveys, catches are highest from Washington to central Oregon, and generally low from southern Oregon to California. New modeling approaches (e.g., sdmTMB)

will be used to develop relative abundance indices from survey data, and are not likely to differ from the delta-GLMM based approaches used in the last assessment. Length data showed some interesting patterns, including an indication of bimodality in the WCGBTS and triennial survey, as well as the trawl discard fleet, which will be further explored.

Very little age data were available in the 2013 assessment, and considerably more age estimates are available for this assessment, including age data from all of the major fisheries and the WCGBTS. This represents a considerable improvement and should allow for sex-specific parameterization, among other modeling options, which was not feasible in the 2013 assessment. All age data are anticipated to be used as conditional age-at-length. There is a relatively large number of fish that have been aged to 100 yr or older. Consequently, the plus group may extend to an older age (e.g., 130 or 150 yr). However, ageing error is non-trivial. There was some discussion about whether age data are available prior to the 2000s, though state representatives were not aware of any earlier sampling of age structures. At least one fisherman had a memory of this species being sampled for otoliths in the earlier days of the trawl fishery.

Natural mortality (M) in 2013 was estimated at 0.042 yr^{-1} and corresponded to a maximum age between 128 and 129 yr. The Gulf of Alaska assessment used a similar M (though derived in a different way) and the Bering Sea/Aleutian Islands assessment assumed an M of 0.05 yr^{-1}, corresponding to a maximum age of 108 yr. The Canadian stock assessments considered a range of M values between 0.033 and 0.055 yr^{-1}. The ten oldest individuals in the current dataset range from 139 to 165 yr and were all male, suggesting that males live longer than females (the top ten oldest females ranged from 121 to 130 yr). These ages suggest M values of 0.033 yr^{-1} for males and 0.055 yr^{-1} for females based on the assumptions of different maximum ages. Estimates of total mortality from a catch curve analysis range from 0.035 to 0.046 yr^{-1}. Some sensitivities to different catch curve assumptions were discussed. The STAT plans to estimate M within the model, with an expected range of values from 0.035 to 0.045 yr^{-1}. Preliminary growth curves suggest that growth is slower and asymptotic size is smaller in the Gulf of Alaska and Eastern Bering Sea.