SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON
PHASE 2 STOCK DEFINITIONS – SCOPING

Scientific Literature Review

The Scientific and Statistical Committee (SSC) reviewed the following reports: Phase 2: stock definitions scoping document (Attachment 1), Updated schedule for developing the Phase 2 stock definitions (Attachment 2), and Literature review of life history aspects of 64 groundfish species managed by the Pacific Fishery Management Council (PFMC) (Attachment 3). These reports describe the process for defining federally-managed stocks and provide literature review results to inform stock definitions for species listed in the Pacific Coast Groundfish Fishery Management Plan (FMP). The literature review excluded stocks that were defined as part of Amendment 31.

The SSC appreciates the comprehensive review of information on genetics, larval dispersal, adult movement, and life history traits to inform stock structure for 67 species and 3 cryptic species complexes. Apart from minor suggested revisions, the SSC endorses the literature review as the best scientific information available (BSIA) to inform stock definitions for use in management. Additional useful information on stock structure was often included in past stock assessments, and a more thorough review of historical assessment documents could provide additional information to inform stock structure decisions. Digitizing and uploading historical stock assessment reports to the Council website would facilitate full review of these documents for the purpose of stock definitions.

Minor grammatical corrections and additional references were identified internally and made available for incorporation into the next iteration of the literature review.

The SSC notes the following inconsistencies between the literature review and the Pacific Coast Groundfish FMP:

1) Dark dusky rockfish (*Sebastes ciliatus*) and light dusky rockfish (*S. variabilis)* are cryptic species with disparate distributions. Dark dusky rockfish are not found in PFMC managed waters. The distribution for light dusky rockfish extends southward into central Oregon, occupying PFMC managed waters. Thus, "Dusky rockfish (*S. ciliatus*)" should be revised to "Light dusky rockfish (*S. variabilis*)" in the FMP.
2) "Rock sole" refers to two cryptic species, northern (*Lepidopsetta polyxystra*) and southern (*L. bilineata*) rock sole. Based on their distributions, southern rock sole should be specified in the FMP. Apart from relatively low abundances in Puget Sound, northern rock sole is not present in PFMC managed waters.
3) Puget Sound rockfish (*S. emphaeus*) was included in the literature review but not listed specifically in the FMP.
4) On page 16 of the FMP there is a footnote that reads "The category 'rockfish' includes all genera and species of the family Scorpaenidae, even if not listed, that occur in the

Washington, Oregon, and California area. The Scorpaenidae genera are Sebastes, Scorpaena, Sebastolobus, and Scorpaenodes." This language may need to be removed as part of the stock definition process. The classification of shortspine thornyhead (*Sebastolobus alascanus*) and longspine thornyhead (*Sebastolobus altivelis*) as "rockfish" should be revised to "thornyheads".

A large number of species lack sufficient information with which to assess spatial population structure. For these, the Council may consider borrowing information from closely related species with similar distributions and/or life history traits. The general tendency for nearshore species to have greater population structure, combined with state-based differences in exploitation histories (as highlighted in past SSC statements), could be justification to define finer scale stock structure for nearshore species when additional information is unavailable.

For completeness, the SSC recommends combining results from the literature review that was previously conducted for the Amendment 31 stocks assessed in 2021 and 2023 with all remaining groundfish species in the FMP, for a single reference document. Another useful improvement would be a table that provides high level summaries for each species and synthesizes information hierarchically (i.e., organizing species based on evidence for or against stock structure). Such a table would promote among-species comparisons. It would also promote an evaluation of potential relationships between species-habitat associations and the presence of stock structure (e.g., if nearshore stocks are more likely to exhibit stock structure along the U.S. West Coast).

The SSC reiterates the need to periodically revisit the literature in search of new information related to stock structure. Doing so will be particularly important for stocks with conflicting or insufficient information. The SSC encourages use of the literature review for other Council-related purposes, including the identification of ecosystem component (EC) species and state vs. federal discussions.

State vs. Federal Water Analyses

The SSC also reviewed the Estimation of recent groundfish catch distribution between federal and state waters off the U.S. West Coast (NMFS Report 1), Estimating groundfish catch distribution across state and federal waters in recreational fisheries (NMFS Report 2), and Exploration of two fishery-independent surveys to inform groundfish stock distribution between federal and state jurisdictional waters off the U.S. West Coast (Supplemental NMFS Report 3).

The SSC received presentations from Sean Matson and Keeley Kent from the NMFS West Coast Region on the above topics. Eric Ward (NMFS NWFSC) was available and provided additional information on some analytical aspects of these reports. The SSC appreciates the considerable amount of work done on this topic, and has the following comments and recommendations.

Commercial Data

The SSC finds the approach of stratifying by sector and summing to be appropriate given different levels of observer coverage across sectors. For sectors with incomplete observer coverage, an evaluation of potential bias between observed and unobserved trips would be helpful to ensure that the data used are representative. Logbook data could be helpful in this analysis. The nearshore live

fish fixed-gear fishery was not separated from the rest of the nearshore fixed gear fishery in this analysis, and a potential for differences between these fleets should be explored. The sdmTMB modeling package, which was used for survey data, could be used to model catch location using location-specific observer data. Washington closed state water to all commercial groundfish gears in 1999, so small amounts of fishing identified as occurring in state waters likely reflect reporting errors.

Recreational Data

The analysis of recreational data is still very much in progress. The information most readily available to assign recreational catch to federal vs. state waters varies greatly among the states. California has a grid system for assigning location used by the Commercial Passenger Fishing Vessels (CPFV), as well as angler reported fishing areas for private boat fisheries, which allows for estimating the relative distribution of fishing activity in state and federal waters in most cases. Oregon has bottom depth information, and the 3 nm line is adequately approximated by the 30 fathom line. Washington does not have similar information to easily apportion catch between federal and state waters. The SSC recommends that analysis should include alternatives removing 2020 data that may not be representative of surrounding years, and including 2023 data, which, in California, is different from previous years due to changes in where recreational fishing took place.

Both California and Oregon have data from on-board observer programs for the CPFV sectors of recreational fisheries that can provide more robust information for future analyses using data that is more reliable than angler self-reported data. These datasets have been linked to habitat data layers and used to develop relative abundance estimates to inform stock assessments. The SSC recommends that these data be considered for future analyses to better refine distribution estimates, particularly for stocks that have high catch in recreational fisheries (relative to commercial catch) and for which more simplistic analyses do not lead to clear conclusions regarding their distribution.

Surveys

The SSC reviewed analyses of catch in federal vs. state waters for the West Coast Bottom Trawl Survey and for the Southern California Bight Hook and Line Survey. Neither survey covers all habitats and depths, and therefore auxiliary information is needed. The trawl survey does not cover areas shallower than 30 fathoms, and does not sample rocky habitat. The analysis could be expanded to consider habitat information, commercial catch-per-unit-effort, and/or additional state and federal surveys that were not considered. Several recommendations for additional surveys that could be helpful were provided to the analysts.

Seafloor Mapping

In California, the efforts of the California Seafloor Mapping Project and separate efforts to support analysis of Essential Fish Habitat (EFH) combined with the bathyline for the primary depth distribution of nearshore species from visual surveys or recreational fishing data can be used to provide an estimate of the proportion of habitat in state and federal waters for comparison to catch. This can be beneficial to consider as catch is dependent on fishing regulations, which have become more liberal since 2018, but still do not allow access to all depths year round.

General Conclusions

As suggested by the SSC in November of 2023, habitat information could help inform many of these analyses, given the strong habitat associations of many species (SSC Minutes November 2023). Habitat information can inform where the fish are likely to occur, which can inform to what extent surveys are encountering fish in federal vs. state waters, as well as where fishing is occurring, particularly for recreational sectors. The Habitat Committee is likely to have insights for the use of habitat data as model covariates.

It would be helpful to simplify the overall process (e.g., prioritize list of 10 guidelines; select example species to work through and develop a process similar to Fishery Ecosystem Plan Initiative 4).

A helpful revision to the next iteration would be organizing all recreational and commercial tables by proportion of catch in federal waters, which would provide more clear information regarding which species and stocks are predominant in either state or federal waters.

Additional data and analytical approaches are available to inform proportional estimates in federal and state waters. Exploring these for all species would be a large amount of work and thus a hierarchical approach to identifying where each stock falls is appropriate. This could start by identifying EC species based upon retention rates estimated from onboard observer programs and other information. The next step would be to assign those stocks where the data clearly shows a predominant catch or presence in either state or federal waters. For the remaining stocks, additional analyses may be necessary.

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