

**SUMMARY OF FINAL INFORMATION TO INFORM SELECTION OF SPECIES FOR ASSESSMENT IN 2023, WORKLOAD, AND OTHER CONSIDERATIONS**

**Stock Assessment Considerations for Species Identified for Assessment in 2023 at the March 2022 Pacific Fishery Management Council Meeting**

At the March 2022 Pacific Fishery Management Council (the Council) meeting the following species were identified for preliminary consideration for a full assessment in 2023: black rockfish, copper rockfish, quillback rockfish, petrale sole, yellowtail rockfish, and rougheye and blackspotted rockfish. Additionally, four species were identified as potential candidates for length-based data-moderate assessments in 2023: English sole, rex sole, longspine thornyhead, and shortspine thornyhead. Finally, three species were identified for early consideration for assessment in 2025: sablefish, yelloweye rockfish, and Pacific spiny dogfish.

The 2022 assessment prioritization ranked black rockfish as the top stock for consideration for assessment in 2023. The black rockfish ranking was driven primarily by the importance of the stock to commercial, recreational, and tribal fisheries. Two additional factors that influenced the ranking of this species was the time since the last assessment (i.e., last assessed in 2015) and the potential of a new survey conducted by Oregon Department of Fish and Wildlife (ODFW) to inform a new assessment in this area.

Quillback rockfish was ranked 4th overall by the 2022 assessment prioritization with the ranking being driven by recent average mortality exceeding the species-specific overfishing limit (OFL), the low overall coastwide stock status (e.g., 26 percent of unfished) based on the 2021 length-based stock assessment, and the potential for this species to be a constraining species for multiple fishing sectors. A full assessment provides additional modeling flexibility compared to a length-based data-moderate assessment (e.g., potential estimation of growth parameters), notably allowing for the possible inclusion of age data, fishery-dependent catch-per-unit effort data, and fishery-independent indices. The detailed data summary (Agenda Item F.3, Attachment 4, June 2022) identifies available age data (including otoliths collected that could be read) collected by recreational fisheries in Oregon and Washington that could be included in a full assessment. To date there are limited otoliths collected in California from the commercial or recreational fisheries, excluding any potential samples that may be available from 2022 sampling efforts that could be read for a full assessment. Additionally, a fishery-independent index of abundance may potentially be available for development between 2017-2022 based on data from the California Collaborative Fisheries Research Program survey (CCFRP, Agenda Item F.3, Attachment 5, June 2022) depending upon the stock boundary for assessment (see additional discussion in “Stock Definitions for Species Selected for Assessment in 2023”). Finally, if any biological collection efforts (e.g., research studies) conducted in California, Oregon, or Washington are identified, these data could inform biological parameters.

Copper rockfish was ranked 29th in the 2022 assessment prioritization and was last assessed as a length-based data-moderate assessment in 2021. Copper rockfish is important to the recreational fishery,

particularly in California. If selected for full assessment in 2023 and similar assessment areas as those used in 2021 are selected, data from the CCFRP survey could be evaluated to develop an index of abundance for the area north of Point Conception (i.e., limited sampling areas south of Point Conception to create area-specific index of abundance). Existing recreational and commercial age data available in Oregon and Washington (primarily only recreational ages in Washington) could be incorporated into area-based assessments. In California, ages from the Northwest Fisheries Science Center (NWFSC) West Coast Groundfish Bottom Trawl (WCGBT) and Hook-and-Line (HKL) surveys could be used either directly in the model (i.e., NWFSC HKL if the stock was split north and south of Point Conception) and to estimate growth externally or internally within the assessment model. Finally, if any biological collections efforts (e.g., research studies) conducted in California, Oregon, or Washington are identified, these data could inform biological parameters.

The last full assessment for petrale sole was conducted in 2013 (i.e., most recently updated in 2019) and was ranked 3rd for consideration for assessment in 2023. Petrale sole is one of the most commercially important species off the U.S. west coast in terms of commercial ex-vessel revenue (e.g., ranked 2nd) and has average high attainment of the OFL (e.g., average of 84 percent between 2018-2020). A new full assessment of petrale sole could incorporate new research on fecundity and an ecosystem driver to improve estimates of annual recruitment variation. The indices of abundance for petrale sole (Agenda Item F.3, Attachment 4, June 2022, page 238) in recent years (2018, 2019, and 2021) are slightly lower than the estimated index of abundance between 2013 and 2017. Additionally, there is little to no indication of strong recruitment in recent years observed in the length composition (i.e., larger circles at smaller lengths in recent years) from the NWFSC WCGBT survey.

Rougheye and blackspotted rockfish were ranked 27th in the 2022 assessment prioritization. Rougheye and blackspotted rockfish are commonly encountered as a bycatch species in the at-sea Pacific hake fishery. The last full assessment of rougheye and blackspotted rockfish was conducted in 2013. The draft default harvest specifications for 2024 would set the OFL to 238 mt with an ACL of 195 mt. Average recent fishing mortality of rougheye and blackspotted rockfish between 2018-2020 has been 192 mt, approximately 99 percent of the draft harvest specification ACL for 2024 (81 percent of the OFL). The index of abundance across recent years from the NWFSC WCGBT survey has been relatively stable (Agenda Item F.3, Attachment 4, June 2022, page 283) and the length compositions indicate a potentially above average recruitment moving through the population, first observed in 2014 (subsequent observations across sizes in 2016-2019) and early possible indications of another strong recruitment in 2021. Additionally, there may be new genetic information to understand the percentage of rougheye rockfish and blackspotted rockfish observed off the West Coast. If the percentage of blackspotted rockfish was sufficiently low, this could allow a new assessment to be classified a category 1 assessment (i.e., the 2013 assessment was classified as category 2).

Yellowtail rockfish was ranked 10th in the 2022 assessment prioritization due to the species' importance to the commercial, recreational, and tribal fisheries. Yellowtail rockfish was most recently assessed in 2017, however, at that time an accepted stock assessment for use in management was found only for the stock north of 40° 10' N. lat. The NWFSC WCGBT survey primarily samples the stock north of 40° 10' N. lat. with large fluctuations from year to year in the indices of abundance since 2015 (Agenda Item F.3, Attachment 4, June 2022, page 391). The development of an index of abundance may be attempted using

the CCFRP survey for the stock north of Point Conception (Agenda Item F.3, Attachment 5, June 2022) and the NWFSC HKL survey has limited observations by year of the stock south of Point Conception with a declining trend in observations in recent years (Agenda Item F.3, Attachment 4, June 2022, page 393).

The four species identified as possible candidates for length-based data-moderate assessments in 2023 all received intermediate ranking in the stock assessment prioritization: English sole (ranked 30th), rex sole (23rd), longspine thornyhead (38th), and shortspine thornyhead (21st). Each of these species were last assessed in 2013 either via a full assessment (longspine and shortspine thornyheads) or index-based data-moderate assessment (English sole and rex sole). The 2013 assessments for both thornyhead species were essentially length-based data-moderate due to the current inability to age thornyhead otoliths. All fours of these species are well observed by the NWFSC WCGBT survey which could provide informative indices of abundance and length compositions to inform a new assessment.

Sablefish is ranked as the most commercially important stock off the U.S. west coast, with a 2022 stock assessment prioritization ranking of 5th overall and was identified as a candidate for possible assessment in 2025. Sablefish was last fully assessed in 2019, with an update assessment conducted in 2021. The results of the recent update assessment estimated a more optimistic stock status relative to the 2019 full assessment with the update estimating that the stock has remained above the management target across assessed years and the final stock status in 2021 was well above the target (fraction unfished of 0.58), with above average recent recruitment driving the stock trajectory up in recent years ([Kapur et al. 2021](#)). The 2021 point estimate from the NWFSC WCGBT survey index of abundance is not only up relative to previous year estimates, but it is also the highest observed survey abundance across the time-series (Agenda Item F.3, Attachment 4, June 2022, page 298). Additionally, a large number of small fish were sampled in 2021 by the NWFSC WCGBT survey, possibly indicating another above average recruitment event entering the population which could be validated with an assessment in 2025.

The most recent rebuilding analysis for yelloweye rockfish indicated a 50 percent probability of rebuilding by 2027 ([Gertseva and Cope, 2017](#)) and was identified by the Council at the March 2022 meeting as a stock that should be considered for assessment in 2025. The data collections by commercial and recreational fisheries for yelloweye rockfish continue to be limited due to regulations. Additionally, observations by the NWFSC WCGBT survey are limited. The 2021 index of abundance point estimate is similar to those estimated for 2018 and 2019, but highly uncertain (Agenda Item F.3, Attachment 4, June 2022, page 377).

Pacific spiny dogfish was ranked low in the 2022 assessment prioritization (ranked 43rd overall), however, is a species of concern given the results of the 2021 stock assessment which estimated the stock to be near the management target of 40 percent with the stock likely to slowly decline in the next ten years ([Gertseva et al. 2017](#)). The index of abundance from the NWFSC WCGBT survey is highly uncertain but reflects a potentially declining trend in abundance between 2003-2021 (Agenda Item F.3, Attachment 4, June 2022, page 232). Research is currently underway to inform the selection of an updated elasmobranch harvest control rule that would better align with the general low productivity of these sharks and skates off the West Coast. Future harvest specification based on any updated harvest control rule could be applied to set future OFLs, ABCs, and ACLs with or without a new full assessment (e.g., catch-only update).

## **Additional Considerations Based on New Information**

Many previously overfished rockfish species have been declared rebuilt over the last decade: widow rockfish (2011), canary rockfish (2015), darkblotched rockfish (2017), and Pacific ocean perch (2017). Observations of rockfish species by the NWFSC WCGBT survey, conducted using bottom trawl gear, can be highly variable by year based on life history (i.e., time spent on or near bottom versus further up in the water column). The sampling variability of the NWFSC WCGBT survey can result in large changes in the indices of abundance from year-to-year that are not indicative of true changes in the population size but rather annual sampling variability. Although indices of abundance for these species can be highly variable from year-to-year, long-term average trends can be useful to understand potential changes in population size across time. There have been sharp increases in indices of abundance for select recent years across many rockfish species (i.e., years between 2015-2018) likely driven in combination by strong recent recruitment and an increase in observations by the NWFSC WCGBT survey those years (e.g., large recruitments observed in 2008 and 2013 for Pacific ocean perch, [Wetzel et al., 2017](#)). In contrast to the recent sharp increases observed in the indices of abundance for these rockfish species, the point estimate for 2021 for many were at or near observed lows: canary rockfish (Agenda Item F.3, Attachment 4, June 2022, page 78), darkblotched rockfish (page 119), Pacific ocean perch (page 219), and widow rockfish (page 368). However, the length composition data reflect some evidence of an increase in the number of small fish observed which could potentially indicate an above-average recruitment event in 2021 (i.e., possibly could be associated with 2020 depending upon size-at-age). These species should continue to be closely monitored and the 2022 NWFSC WCGBT survey may provide additional understanding around the trends in population sizes for these rockfish species.

Bocaccio is most commonly encountered south of 40° 10' N. lat. and is observed by both the NWFSC WCGBT and HKL surveys. Bocaccio rockfish was declared rebuilt in 2017 ([He and Field, 2017](#)). The index of abundance from the NWFSC WCGBT survey has been variable since 2015 but the 2021 point estimate declined from the 2018 and 2019 observations (Agenda Item F.3, Attachment 4, June 2022, page 53). The trend of the index of abundance from the NWFSC HKL survey has declined in recent years since a near high observed in 2013 (page 55).

Big skate was last assessed in 2019 ([Taylor et al., 2019](#)) and the estimated stock scale was highly uncertain. One source of uncertainty around the scale of the stock was due to the unobserved portion of the stock in less than 55 meters not sampled by the NWFSC WCGBT survey. Observations of big skate in 2019 and 2021 by the NWFSC WCGBT survey were notably down relative to observations between 2014-2018 (i.e., in 2019 only two vessels used in the survey relative to the standard four), however, were in line with observations earlier in the time-series (Agenda Item F.3, Attachment 4, June 2022, page 25). Observations of big skate by the survey in 2022 may shed additional light on the current trend in the population.

Cowcod was declared rebuilt in 2019 ([Dick and He, 2019](#)). One of the key sources of data used in the most recent assessment of cowcod was the NWFSC HKL survey. The index of abundance point across recent years continues to reflect a potential slow increase in the observed population (Agenda Item F.3, Attachment 4, June 2022, page 109).

## **Updates and Correction to Materials**

The “NMFS Assessment Prioritization Workbook” includes four minor corrections to the revised version that was provided in the March 2022 Briefing Book:

1. On the “Stock Status” tab the estimated percent fraction unfished was corrected for Pacific spiny dogfish to the final adopted model stock status of 42 percent. The version provided in the March 2022 Briefing Book incorrectly had a stock status of 34 percent. Correcting the estimated percent fraction unfished changed the Stock Status score from 5 to 4, resulting in the same rank of 10 (tied with four other species). The updated overall Factor Summary rank changed to 43 overall, compared to the incorrect March 2022 ranking of 40.
2. The pseudo value calculation (e.g., landed metric tons multiplied by the relative importance to angler by state) on the “Recreational” tab was not carried across low ranked species. This issue only resulted in a change in ranking to rosy rockfish. The recreational rank of rosy rockfish increased to 25 up from the March 2022 value of 45 (tied with other species). This correction changed the Factor Summary rank of rosy rockfish to 51 from the March 2022 rank of 62.
3. An issue was identified in calculating fishing mortality, OFLs, ABCs, and future harvest specifications for blue and deacon rockfish and rougheye and blackspotted rockfish. Corrections were made to the rougheye and blackspotted rockfish values in the “Fishing Mortality” and the “2024 SPEX Limiting”, resulting in no changes to the ranking or final modifier values. Correcting the values for blue and deacon rockfish in the “2024 SPEX Limiting” table resulted in a reduction of the final modifier value from 3 to 0 (i.e., lower percent of potential attainment of 2024 Annual Catch Limits [ACLs]). The change in the final modifier was updated in the “Const. Demand” tab resulting in a decline in rank to 18 (i.e., previous incorrect ranking was 6). A similar correction was made in the “Fishing Mortality” tab to the recent average fishing mortality and ABC resulting in a reduction in rank from 6 to 20. Updating the scores from Fishing Mortality and Constituent Demand in the Facto summary decreased the overall ranking to 22 (down from a ranking of 6).
4. The future harvest specifications (“2024 SPEX Limiting” tab) for sablefish corrected the future ACL and the resulting potential future ACL percent attainment resulting in an increase in the final modifier to 0 (i.e., increase from -2). The update to the final modifier was corrected in the “Const. Demand” tab resulting in an increase in the factor rank to 20 from 45. Updating the constituent demand factor in the overall factor summary, resulting in an increase in rank to 5th overall (i.e., previous rank of 8).

The “Detailed summary of available data to support West Coast groundfish stock assessments in 2023” document includes several updates from the version included in the March 2022 Briefing Book. The changes are as follows:

1. Data collected in 2021 from commercial and recreational fisheries along with data collected by the NWFSC WCGBT survey and the NWFSC HKL survey have been added to the species-specific data tables.
2. Species-specific indices of abundance and length composition figures from the NWFSC WCGBT and NWFSC HKL surveys have been added for species commonly observed by these surveys.

3. The numbers of aged fish and available otoliths that could be read for the NWFSC HKL survey do not reflect fish that were aged in 2020 and 2021 for copper rockfish, squarespot rockfish, and vermillion and sunset rockfish.

## Workload Considerations

### *Assessments*

The NWFSC and Southwest Fishery Science Center (SWFSC) groundfish assessment groups have jointly discussed the preliminary list of species recommended for assessment in 2023 at the March 2022 Council meeting, particularly with respect to required and available staffing to support successful assessments and scientific reviews. Although the Council may have the ability to accommodate four STAR Panels in 2023, with the number of areas needing to be modeled for the prioritized nearshore stocks, it will be challenging for the Science Centers to staff the development and review of four STAR Panels worth of assessments.

We anticipate that coastwide benchmark assessments of black and quillback rockfishes would each include three modeled areas, and copper rockfish would include four, regardless of whether Northern California boundaries are set at 40° 10' N. lat. or at 42° N. lat. That would represent ten assessment models across three STAR Panels. Even with only one permanent staff member assigned to each modeled area, that would exhaust the NWFSC and SWFSC capacity, without additional modeling contributions from students, postdocs, or others (see Table 1, Option 1a). Additionally, all of the species-area models, except off of Washington, will include both recreational and commercial (live and dead) fisheries, all of which may have notably different selectivity functions. The NWFSC again intends to conduct a course in cooperation with the University of Washington (UW) where students can either ideally conduct a length-based data-moderate (LB-DM) assessment, but a relatively straight forward full assessment may be viable, which will enable work on one additional species. Depending on other decisions, we see a petrale sole benchmark or a LB-DM for shortspine thornyhead as being the two most promising candidates for class focus, given that no update assessments were included in the March 2022 list. If some non-Agency modeling assistance is realized, it would likely be possible to review both shortspine thornyhead and petrale sole in a fourth STAR panel (Table 1, Option 1b).

Table 1. Detailed table presenting alternative options for STAR panel composition in 2023 depending upon the species selected for assessment.

Species	Modeled Areas	Agency Staff			Notes
		Needed	Available		
<b>Option 1a - conservative</b>	10	10	10		
Panel 1 Black rf	3	3		A postdoc is expected to help with the southern model	
Panel 2 Copper rf	4	4			
Panel 3 Quillback rf	3	3			
Petrale sole;				Ideally, the STAR Panel would be scheduled for Seattle, beginning	
Panel 4 or LB-DM: Shortspine		Grad student class		June 5 or May 22, so as to facilitate maximum class participation in the review	
<b>Option 1b - less certain</b>	10	10	10		
Panel 1 Black rf	3	3		A postdoc is expected to help with the southern model	
Panel 2 Copper rf	4	3		Greater need for additional non-Agency participation	
Panel 3 Quillback rf	3	3			
Shortspine	1	1		Ideally, the STAR Panel would be scheduled for Seattle, beginning	
Panel 4 Petrale sole		Grad student class		June 5 or May 22, so as to facilitate maximum class participation in the review	
<b>Option 2</b>	8	10	10		
Panel 1 Black rf	3	3		A postdoc is expected to help with the southern model	
Panel 2 Copper rf	2	2		Only CA models, continuing to use 2021 LB-DMs for north	
Quillback rf	1	1		Only CA models, continuing to use 2021 LB-DMs for north	
Panel 3 Petrale sole	1	2			
Rougheye rf	1	2			
LB-DM: Shortspine		Grad student class		STAR Panel or SSC GF Sub-comm. review in late May or early June	
<b>Option 3</b>	9	10	10		
Panel 1 Black rf	3	3		A postdoc is expected to help with the southern model	
Panel 2 Copper rf	4	3-4		One of these might need additional non-Agency participation	
Panel 3 Petrale sole	1	2			
Rougheye rf	1	1-2		One of these might need additional non-Agency participation	
LB-DM: Shortspine		Grad student class		STAR Panel or SSC GF Sub-comm. review in late May or early June	

Options 2 and 3 present other alternatives for assessing petrale sole and one other species, through reducing some of the nearshore species workload. Under Option 2 new benchmark assessments for copper and quillback rockfishes would only be conducted in areas off California, with management for Oregon and Washington continuing to rely on the results of the 2021 LB-DM assessments. Option 3 would delay a new quillback rockfish assessment, where relatively little new data are expected to be available for inclusion in a benchmark, compared to the 2021 assessment. Although the 2021 NWFSC WCGBT survey index of abundance estimate for petrale sole remained roughly the same as the 2019 value, there continues to be no evidence of substantial recruitment in the length data since 2012. Additionally, there is a new ecosystem driver of recruitment and fecundity research that should be explored in the next benchmark assessment.

If a panel with petrale sole and rougheye and blackspotted rockfish or yellowtail rockfish is prioritized, we recommend that the second ‘species’ in that STAR panel be the rougheye and blackspotted rockfish complex. Attainment for these species has averaged between 88-95 percent of the ABC over the past three

years (2018-20), and the last full assessment for both species will be ten years old next year. Furthermore, in addition to catch as part of targeted bottom trawling for slope rockfish species, rougheye and blackspotted rockfish has been an occasional bycatch species of concern within at least one sector of the Pacific hake fishery. In 2013 the Scientific and Statistical Committee (SSC) recommended that the assessment for rougheye and blackspotted rockfish was not a good candidate to be updated, so a benchmark assessment is needed to provide new harvest specifications that would incorporate time-varying sigma. If the UW class were to develop a LB-DM assessment for shortspine thornyhead, as shown in Options 2 and 3, it might make sense for the SSC Groundfish Sub-Committee to consider reviewing that assessment, rather than convening a separate STAR panel for a single LB-DM review.

#### *Catch-Only Projection Updates*

The Council identified three species in March to have projections updated using realized fishing mortality amounts since the last assessments: cowcod, yelloweye rockfish, and Pacific spiny dogfish. We would note that the 2018-20 fishing mortalities for cowcod have represented 7 percent of the ABC amounts for that period, and for yelloweye rockfish fishing mortalities of over that same period have resulted in ABC and ACL attainments of 33 percent and 57 percent, respectively. In the absence of planned management changes that could significantly increase fishing mortality, these would not appear to be the best candidates for this sort of update. Additionally, a catch-only update for Pacific spiny dogfish would only update removal assumptions for two years (2021-22) which may only provide a limited adjustment in the updated OFLs and ABCs. Finally, the capacity of the NWFSC and SWFSC to complete all three of these in a timely manner would be highly dependent on the full suite of other species adopted, as well as the amount of non-Agency help that is realized. It may be more realistic for the Council to rank these and acknowledge that they would be undertaken, as resources permit.

#### *General workload considerations*

The 2021 assessment and review cycle was a demanding and challenging one for assessment staff, especially for several from the NWFSC. Nine main assessment authors from both Centers developed and defended assessment models for eight species and 16 species-areas last year. Five of the nine were individually involved in assessments for two completely different species between January and July. Additionally, modeling for three species was extended, unexpectedly, well beyond the scheduled June conclusion, despite SSC endorsement of all three in June. Two of those were intended to be faster-to-create-and-review LB-DMs, for which modeling work began prior to an October 2021 pre-assessment workshop and continued through the September 2022 mop-up (i.e., a full year). The level of workload experienced in 2021 is not sustainable. The development and particularly review of stock assessments are stressful for their authors under the best of circumstances. The rigors of 2021 challenged the mental, emotional, and/or physical well-being of most participants, and repeating that toll will risk the retention of highly-skilled professionals and jeopardize our ability to recruit similarly-talented employees in the future.

### **Council Requests from the March 2022 Council Meeting**

At the March 2022 Pacific Fishery Management Council meeting, the Council requested feedback from the NWFSC and SWFSC on the following questions:

- 1) How will 2023 assessments proceed in line with discussions on stock definitions?
- 2) How should stocks of the same species be assessed according to conservation need (i.e., do all areas need to be assessed at once)?
- 3) Presuming nearshore and shelf stocks should be assessed at as fine a scale as the data allows or when areas are combined, how should regional differences in status be evaluated?
- 4) What is the feasibility of a research assessment for shortbelly rockfish in 2023, 2025, or out-of-cycle?

We provide some thoughts and items for consideration on each of these questions below.

### ***Stock Definition for Species Selected for Assessment in 2023***

Given that the Stock Definition undertaking will only be in the scoping phase in June, it will be important for assessment authors to have reliable guidance on any stock boundaries by at least the close of the November Council meeting, and preferably the September meeting. Considerable work is involved in extracting, organizing, and processing data for use in assessments. Model development and exploration cannot begin until all a sufficient amount of data are ready for use. Even without the final year of data being available, it is important for scoping of new benchmarks to be able to begin early, in order to identify potential problem areas needing more attention. This is also true for areas that have experienced modeling problems in the most recent benchmark assessments (e.g., Oregon black rockfish). Early identification of stock-boundary intent for species being assessed will help assessment authors avoid unnecessary work. To this end, assessment staff will report any particular issues of concern they identify regarding stock boundary options for species being assessed in 2023 by the September Council meeting.

Quillback rockfish provides an excellent example of the potential impact of stock boundary determinations on the planning and execution of assessments, in 2023 and beyond. Recent review of data from the CCFRP survey (as reported in Agenda Item F.3, Attachment 5, June 2022) indicates that roughly 57 percent of the 261 quillback encountered between 2017-21 were caught at the northernmost sampling locations, which are north of 40° 10' N. lat. If that line were specified as a stock boundary for quillback rockfish, an average of only about 22 quillback rockfish per year would remain for purposes of constructing a 5-year abundance index in the area south of 40° 10' N. lat. Development of an informative index from these data for all of northern California is not a certainty, but requiring that 40° 10' N. lat. be used as a northern California boundary for a quillback rockfish assessment would likely result in this survey not contributing an index to areas on either side of that boundary.

### ***Species with Multiple Assessment Areas***

Currently the expectation when selecting a species for assessments is that the species is assessed across their entire U.S. west coast range within the same year, even if there are likely to be multiple assessment areas. One of the major benefits of this approach is that similar data and modeling considerations can be made in a consistent manner across the modeled areas. The understanding around biological processes (e.g., natural mortality, steepness, fecundity, growth), data treatment, data processing methodologies (e.g., creation of indices of abundance or expansions of composition data), and modeling best practices evolves across time. Assessing all areas of a species concurrently allows for consistent treatment across modeled

areas, allowing modeling results to be driven by area-specific stock dynamics and fishery differences rather than by arbitrarily-varying biological parameter assumptions, data treatment, or modeling practices.

The preliminary list of potential species to assess in 2023 identified at the March 2022 Council meeting contains three nearshore stocks that are likely to have 3-4 assessment areas per species. Two of the species are species that were assessed in 2021 using LB-DM methods. As shown in Table 1 Option 2, restricting the areas assessed in 2023 for both copper and quillback rockfishes to only California would allow the NWFSC and the SWFSC to conduct other assessments. If this option is selected, the 2023 full assessments would be used to provide information for management in California, while harvest specifications in Oregon and Washington would continue to be determined by the 2021 LB-DM assessments. Focusing full assessments efforts on specific areas of high concern, could lead to better-informed assessment results in California with the acknowledged trade-off of not being able to incorporate any update growth and biological information, existing age data, and potential age reads within the Oregon and Washington assessments models.

At the March Council meeting, the SSC reiterated comments ([Agenda Item E.8., Attachment 6, March 2022](#)) made at the November 2021 Council meeting ([Agenda Item E.2.a, Supplemental SSC Report 1, November 2021](#)) that:

*“even if individual assessments were improved by referral to “mop up” or other post-STAR panel review processes, there could be an FMP-wide risk of turning an unbiased process into a biased one if only “pessimistic” assessments were subject to this additional scrutiny.”*

While the above comment refers to subsequent additional analyses that were requested during the 2021 assessment season primarily for copper rockfish and quillback rockfish, the intent of the statement may have some relevance if only assessment areas with pessimistic results were selected to be re-assessed. Across time, subsequent assessments of a species are commonly observed to vary in some degree around population estimates and suggested management implications due to new data sources, additional new data of existing data sources, updated biological parameter assumptions, and advances in modeling ‘best practices’. Therefore, careful consideration should be given to the selection of conducting full assessments on select areas.

Additionally, it is worth noting that heightened focus and additional data do not guarantee that assessment models will yield higher stock status and OFLs. For example, following a 2005 assessment of yelloweye rockfish that yielded highly-constraining management results, additional assessments were conducted off-cycle in 2006 and then again in 2007. Each of these subsequent assessments yielded estimates of stock status and ABC that were lower than its predecessor’s. Also, in addition to the potential issue of bias, rapidly repeating assessments for particular species, in general, increases the challenge of keeping assessments reasonably current for the more than 30 species that have had benchmark assessments.

Finally, it would be beneficial if the SSC could provide any additional comments or concerns they may foresee regarding the implications of only assessing select areas of a species in 2023.

### *Assessment Areas with Regional Differences in Stock Status*

We anticipate that this issue will be addressed as part of the stock definition discussion.

### *Potential of a Research Assessment of Shortbelly Rockfish*

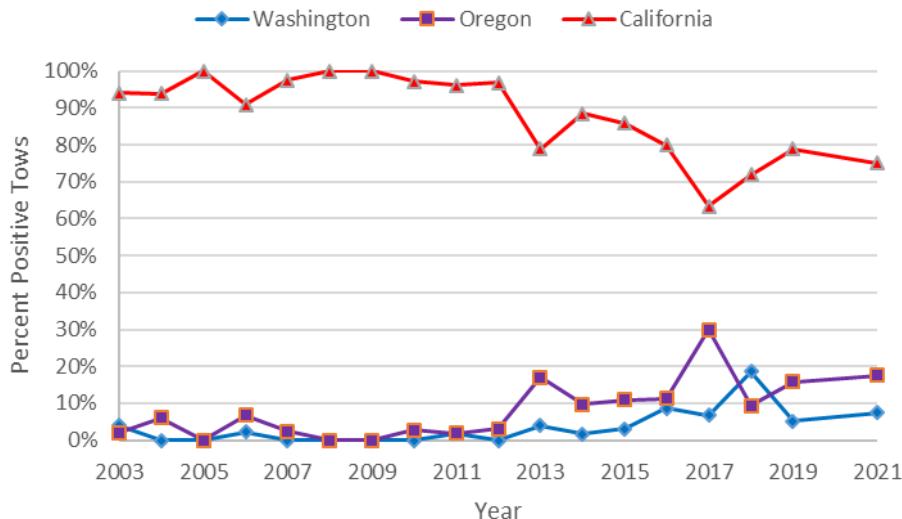
Stock assessment staff capacity to conduct a research assessment for shortbelly rockfish in either 2023 or 2024 is highly limited. Currently, the SWFSC who led the previous research stock assessment for shortbelly rockfish ([Field et al., 2007](#)) is down one stock assessor due to recent retirement. It is unlikely to have the position backfilled and a new stock assessor trained to lead or assist in assessment efforts for shortbelly rockfish in 2023 or 2024. Conducting research to better understand the current population dynamics of shortbelly rockfish remains a long-term priority.

Shortbelly rockfish are sampled by the NWFSC WCGBT survey at fluctuating frequency across years due to the species mid-water nature. Table 2 provides the number of positive tows and fish sampled by the NWFSC WCGBT survey across years.

**Table 2. The number of tows that observed shortbelly rockfish and the total number of lengths collected by year for the NWFSC WCGBT survey.**

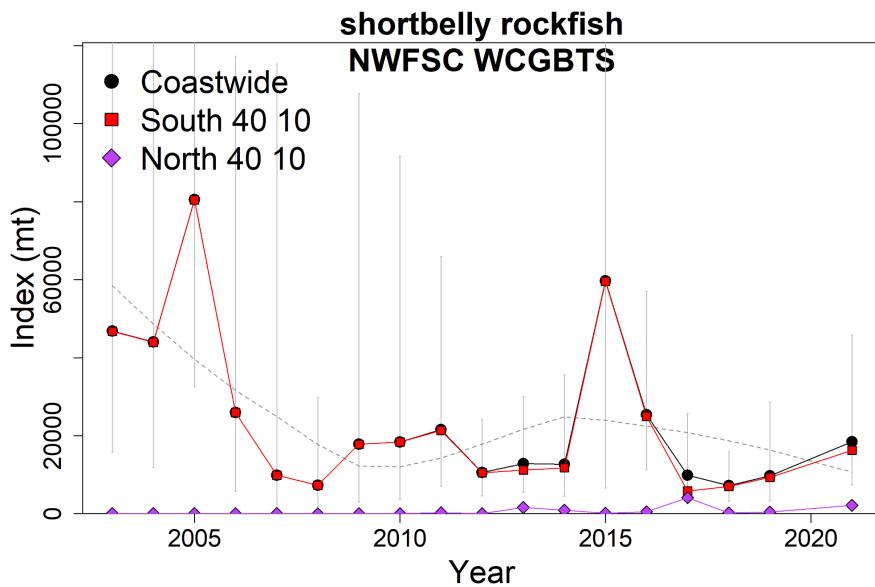
Year	Positive Tows	Total Length Samples	Year	Positive Tows	Total Length Samples
2003	49	1908	2013	76	813
2004	48	2409	2014	111	1327
2005	67	1913	2015	63	676
2006	43	1392	2016	78	809
2007	41	991	2017	90	722
2008	47	841	2018	75	740
2009	35	855	2019	38	386
2010	73	1673	2020	-	-
2011	52	835	2021	90	755
2012	65	918			

The majority of positive tows with shortbelly rockfish occur south of 40° 10' N. lat., however, in recent years there has been an increase in the percentage of positive tows off the coast of Oregon and Washington (Figure 2). This observed range increase or shift of the shortbelly rockfish distribution off the U.S. west coast is consistent with an increase in incidental catch of shortbelly rockfish by the Pacific hake fishery off the coast of Oregon in recent years.



**Figure 2. Distribution of annual NWFSC WCGBT survey positive tows containing shortbelly rockfish among waters of each state.**

The relative estimated biomass by year between the areas north and south of  $40^{\circ} 10'$  N. lat. are shown in Figure 3.



**Figure 3. Index of shortbelly rockfish abundance from the NWFSC WCGBT survey from 2003-2021 (excluding 2020) for the full area (black line with circles) with area-specific estimates (shown in either red or purple). A loess smoother line was fit to full area estimate and is denoted by the grey dashed line.**