NORTH PACIFIC FISHERY MANAGEMENT COUNCIL

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Meeting of the Gulf of Alaska Groundfish Plan Team

Plan Team Report

November 12-15, 2024

GOA Groundfish Plan Team Members:

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Chris Lunsford	AFSC ABL (co-chair)	Nat Nichols	ADF&G
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Abby Jahn	NMFS AKRO	Paul Spencer	AFSC REFM
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Lisa Hillier	WDFW	James Thorson	AFSC REFM
Pete Hulson	AFSC ABL	Sophia Wassermann	AFSC RACE

Introduction

The Gulf of Alaska (GOA) Groundfish Plan Team (Team) meeting started at 1:00pm PST on Tuesday, November 12th at the AFSC. Participation was both in person and offered remotely via Zoom. Roughly 30 people attended the meeting in person, with many more signed in remotely, but attendance varied throughout the meeting. All documents and presentations were posted to the Teams' electronic agenda. All presentations are also linked in the header for each agenda item in this report.

Assessment discussions and general recommendations

As noted in the September 204 GOA Groundfish Plan Team Report, the Team notes that the term East Yakutat District (EYAK/EY) was used 1991-1996. Currently, all waters between 137"00' W. longitude and 140"00' W. longitude are incorporated into Southeast Outside (SEO/650). For consistency with regulations, assessment authors and Team reports should use SEO instead of references to EYAK.

The Team noted that some assessments (e.g., northern rockfish and others) start prior to the beginning of the AFSC bottom trawl survey in 1984, and that this early data can be used to inform starting conditions based on catches during this earlier period. The Team discussed the option that such assessments might consider analyzing early ADF&G survey data (e.g., the Pandalus vessel) to better understand potential regime shifts occurring during that earlier era. This consideration could be done in conjunction with (or led by) ESR authors, who would have valuable expertise regarding identifying potential regime and productivity shifts prior to beginning of the AFSC bottom trawl survey in 1984.

Data Loss Discussion

Throughout the week the Team noted the loss of data that will affect stock assessments:

- The 2024 AFSC longline survey did not occur
- The 2024 ADFG yelloweye ROV survey did not occur
- The 2024 IPHC longline survey had reduced coverage in Southeast Alaska
- The sablefish fishery logbook data stream ended in 2023
- Potential loss of 2025 MACE GOA acoustic-trawl summer survey (could be redistributed elsewhere as noted in September 2024 GFPT Report)

GOA Survey Planning

Ned Laman presented survey area footprint changes for the GOA bottom trawl survey that result from the optimization and restratification of the historic survey grid conducted by Zack Oyafuso. The historic stratification scheme in the GOA (1990-2023) was based on International North Pacific Fisheries Commission (INPFC) sampling districts; the restratification relies on extant NMFS Sampling Districts. The author was seeking feedback on a proposal to cease sampling in areas within the NMFS district 519 in Unimak Pass north of 610 and district 659 on the east side of 650. These areas are not part of the NMFS sampling districts that delineate the GOA region. Removing these areas would result in an approximately 1.3% reduction in the WGOA, an approximately 3.2% reduction in the EGOA, and an approximately 1.4% reduction across the Gulf as a whole. Eliminating these areas from sampling could also result in a maximum change of around 4% in the estimated biomass of the most abundant species from bottom trawl survey catches. The author noted that, to begin timely planning for the 2025 GOA bottom trawl survey, these changes need to be implemented by this December.

The Team discussed whether the area in 519 is included in any of the other NMFS bottom trawl surveys; currently it is not. The Team also discussed that it is generally not desirable to have a hole between the GOA, AI, and BS surveys which arises when dropping the portion of area 519. The Team also discussed the potential impacts of changes in biomass estimates on apportionment within the Western and Eastern GOA, considering the ongoing fishing activity in Unimak Pass and the elimination of the inland SE Alaska waters in district 659.

The Team agreed that the restratification to NMFS sampling districts is an improvement and that including the areas outside of those districts in 519 and 659 would not be appropriate for future, restratified GOA bottom trawl surveys. The Team discussed the options for including the area within district 519 in the AI survey, noting that the GOA and AI surveys currently use the same gear. The Team provided the following recommendations to facilitate bridging the restratification for 2025 stock assessments.

- **As a diagnostic, the Team recommended re-calculating the time series of design-based indices of abundance and age composition (when possible) for GOA stocks in two steps: 1) with the areas in 519 and 659 included but the hauls removed; and 2) with the area and tows removed.**
- **The Team recommended that the resulting percent differences be presented disaggregated by Western and Eastern GOA and overall.**
- **The Team recommended assuring that shapefiles be created for the survey and the management areas used for apportionment before and after this change, and be made publicly available.**

GOA Ecosystem Status Report

Bridget Ferriss presented the GOA Ecosystem Status Report (ESR), which continues to be synthesized by combining indicators from various ecosystem components. These indicators, which range from physical oceanography to biological observations and human dimensions reflect the current status and trends of these components.

Overall, environmental conditions in the GOA for 2024 were generally viewed as being positive. El Niño was officially classified as strong, but effects were moderated in the GOA; there were no major signals in GOA ecology typically observed with strong El Nino (e.g., increase in harmful algal blooms, widespread seabird die offs, unidirectional shifts in intertidal community species composition, etc.). While EGOA was above the statistical heatwave threshold all spring, it is now experiencing average fall conditions and there is no sign of heat being mixed to depth. The outlook for 2025 is neutral, with conditions expected to be warm but not extreme.

It appears that 2024 has been a good year for productivity with observed increases in mesozooplankton and diatom production. It was noted that groundfish communities in GOA have shifted from being dominated by piscivorous species (Arrowtooth flounder) to planktivorous species (Pacific ocean perch and pollock) in recent years.

The Team recognizes the substantial amount of work involved in collecting and synthesizing data for the ESR and appreciates the contributions of all involved.

The Team made no formal recommendations but discussed the following ideas for future work:

- Explore the use of Loreau et al. (2008, Eq. 9) index for portfolio effects to quantify whether community-wide consumption has been more stable than expected by chance given the variance in each individual species. .

- Validate conceptual models either by replicating hypothesized linkages using a linear regression of the predictor and response variables that are included in the ESR, or using dynamic structural equations to synthesize these linkages.

- Developing composite indicators that combine multiple indicators that are currently included and are intended to represent some higher-level process, e.g., using pink salmon and other species to create a composite indicator for the nearshore community biomass.

- Exploration of ecosystem dynamics between EGOA (closed to trawling) and CGOA/WGOA (open to trawling) was discussed. .

- Suggestion from the Team to the author that recapping highlights from the previous year's ESR at the beginning of the presentation would be a helpful refresher to facilitate Team discussion.

Pollock Ecosystem and Socioeconomic Profile (ESP)

Kalei Shotwell and Russel Dame presented the GOA pollock ESP in an update, report card format that included 23 indicators. There was a question of whether the CEATTLE model has time-varying proportions of diet data. CEATTLE can accommodate annual diet data to empirically derive time-varying predator-prey suitability if diet data are available for all years of the hindcast or estimate time-invariant suitability by fitting to annual diet data (that may not be available for all years). However, given gaps in diet data across years in the EBS and GOA, further analysis of diet data is needed to derive input sample sizes for the later approach. Further discussion was generally that it is easier to interpret diet information in a direct data-based summary than through a model framework such as CEATTLE. The Team noted that it would be easier to interpret a time-series of consumption of pollock by other predators that is assembled in a way that has less model structure. For example, model-based standardization of predator-expanded diet sampling (Gruss et al. 2020) is being computed for snow crab consumption by Pacific cod in the Bering Sea, and a similar product could be considered here. Also, Barnes et al (2020) developed a hindcast predation index for pollock that could be constructed using similar inputs used for CEATTLE.

It was noted that the importance indicators have been fairly consistent through time for GOA pollock. There was discussion on whether some of the indicators are reasonable, though no resolution on this was achieved. There was a comment that variance added to indicators (where applicable) would be beneficial. There was substantial talk about considering some sort of Chinook salmon indicator since the CGOA fishery was recently closed in response to exceeding the Chinook PSC limit.

The Team recommended that the authors consider developing Chinook bycatch indicators from an ecosystem context, e.g., hatchery production, Chinook marine survival, catch rates, or some combination thereof. This could include socioeconomic indicators that provide information on impacts of the shutdown of the fishery in 2024 and the potential for future issues.

Pollock

Cole Monnahan presented a full assessment for walleye pollock. Four recommended changes to the previous model were presented:

1. Coefficients of variation and input sample size were updated for the survey data fit in the model,
2. An environmental covariate was used to inform time-varying catchability for the Shelikof straight survey,
3. Age-1 and -2 indices from the Shelikof straight survey were removed,
4. The Dirichlet-multinomial distribution was used in place of the multinomial for all composition data.

The Team raised the question of whether the low proportion of females in the catch was of concern. Cole noted that there was no concern and noted that this has been explored in the past and is more of a behavioral issue of spawning dynamics and fleet interactions. It was noted that the Bogoslof area is heavily stratified by sex during spawning time.

Based on the update to the input sample sizes for survey data, the Team noted that current efforts to develop fishery input sample size functions should also include weight-at-age and variance as output.

The Team noted that there is a need to evaluate vertical distribution patterns, which is difficult with the loss of summer acoustic survey to compare with bottom trawl survey.

The Team agreed with the authors' recommended model (Model 23d) and resulting OFL and ABC with no reduction from maximum permissible ABC. The Team also agreed with the recommended apportionments and had the following recommendations:

- **The Team recommended evaluating vertical distribution of pollock in the water column due to the lack of fit to the bottom trawl survey.**
- **The Team recommended looking into methods that allow inclusion of additional surveyed areas not currently included in the winter survey index estimates.**
- **The Team recommended evaluating dropping 3 year olds from the Shelikof Strait survey, which would also include reevaluation of dropped age 1 and 2 data.**

Pacific cod ESP

Kalei Shotwell and Russell Dame presented this year's Pacific cod ESP (Appendix 2.1 in the SAFE). There were 16 indicators explored. New indicators (all from the GOA CEATTLE multispecies model) included: 1) time-varying natural mortality for Pacific cod; 2) annual ration of age 1+ Pacific cod, and 3) consumption of Pacific cod by all predators. The summer Pacific cod YOY beach seine survey has been added back into the ESP after being explored for use in the assessment. Seven indicator values were not available this year due to no surveys being conducted. The most influential variables for predicting recruitment were GOA summer bottom temperatures and annual eddy kinetic energy in the Kodiak area. Economic indicators indicate that both ex-vessel value and price decreased in 2023.

Pacific cod assessment

Pete Hulson presented the GOA Pacific cod stock assessment. The author recommended model (Model 24.0) included a series of changes affecting the processing of input data (e.g., updating the aging error matrix, better utilization of the ADF&G length compositions, computation of length composition data) and relatively minor model changes (e.g., removing the estimation of forecast recruitment parameters, and increasing the length composition bin size from 1 cm to 5 cm). The assessment results are similar to those from the assessment used for management this year (less than 1% ABC from last year to this year). The shift from 1 to 5 cm size bins improved the ratio between the input and estimated sample sizes and substantially decreased the model run time. A maturity study is ongoing, and results may be available as early as next year.

The estimated trawl survey catchability coefficient increased from ~ 1.1 in previous assessments to ~ 1.3. The Team discussed that a potential mechanism for the trawl survey catchability coefficient exceeding 1 should (ideally) be identified, and that previous assessments have found that effective catchability (i.e., after accounting for selectivity) were below 1 for a range of ages.

While biomass projections are positive, they are based on average recruitment that has been below average since 2014. The stock is at Tier 3b, with 2024 SSB estimated as 29% of $B_{100\%}$.

The Team asked what would happen if the adjustment of natural mortality for the marine heat wave years were removed, and the author expressed that without the environmental link, the model cannot explain the decline in abundance prior to 2020. There was discussion about the merits of moving the model to R-TMB to allow for novel applications of environmental data such as was shown for the GOA pollock assessment.

The Team was interested in the length-weight and length-age relationships estimated from the bottom trawl survey. The Team had a general discussion about how much leverage conditional length at age has on the model results and the history of the model.

The Team agreed with the authors' recommended model (Model 24.0) and the authors' recommended ABCs and OFLs, with no reduction from maxABC.

The Team recommends continued work on the modeling of size and weight at age, potentially including: 1) whether the conditional age-at-length data needs to be corrected for length-stratified survey sampling; 2) evaluating time-varying growth; 3) using age compositions rather than conditional length at age; and 4) using empirical estimates of length and weight at age.

Northern Rockfish

Ben Williams presented a full assessment for northern rockfish which is assessed on a biennial schedule. A suite of models building on incremental changes were investigated for this assessment:

1. The accepted base model from 2022 (base)
2. Model 22.1 with lognormal survey biomass likelihood (22.1a)
3. Model 22.1a with updated input sample sizes (Model 22.1b)
4. Model 22.1b with lognormal VAST survey biomass (Model 22.1c)
5. Model 22.1c with updated maturity (m24), which is the authors' recommended model

Adding 2024 data (Model 22.1) resulted in a slight increase in female spawning and total biomass estimates. Using a lognormal error structure for the survey biomass likelihood follows best practices (Model 22.1a). Updating input sample size methodology is procedurally a more accurate method than previously used (Model 22.1b). Changing to the lognormal VAST survey biomass (Model 22.1c) results

in a fit that aligns with the population dynamics of a long-lived species that likely doesn't fluctuate as much as survey results do, and this change performs slightly better (less variable) than the GAP default methods. Finally, the author recommended model (m24) incorporates new additional maturity information for informing the maturity ogive.

Additionally, the author transitioned the model software from ADMB to RTMB and provided a comparison of the base model results in both frameworks to show results are nearly identical. All models presented were run in RTMB including the author recommended model m24; the models were also run in ADMB to double check for identical results.

The author noted the scale of the total and spawning biomass estimates and resulting ABCs have increased despite a decline in recent survey estimates. This is attributed, in part, to the change in using the lognormal survey biomass likelihood which results in an overall larger population being estimated compared to the previous assessment. The switch to the lognormal VAST model has also "smoothed" the highly variable annual survey index biomass estimates. Last, the survey biomass estimates continue to have a model weight of 0.25, which reduces the influence of the survey on model outputs.

The Team noted the poor fits to the fishery lengths from the 1990s to which the author responded that this has been a long-standing issue in this assessment. The Team discussed potential explanations for this and concluded that much of the historical data for this species is likely suspect since many of the minor rockfish species such as northern rockfish were considered a part of the POP fishery and often referred to as red rockfish, so accurate historical population level data may be difficult to reconstruct for informing the model in the early years (1990s). The Team also noted this stock typically exhibits highly variable recruitment but that in recent years recruitment estimates have been low. The realized catch is lower in 2024 but an industry member confirmed this is attributable to market conditions rather than inability to catch fish.

The author was asked if the new FT-NIRS technology would soon be available for production ageing of northern rockfish. The author noted that FT-NIRS has been successful in ageing northern rockfish and may be implemented in the future, but there are no immediate plans to use FT-NIRS for production ageing. The author also noted that FT-NIRS is also being looked at for maturity estimation which would be a significant contribution considering the lack of maturity information available and that evidence of skip spawning has been documented for this species.

The author recommended model is model m24 with no reductions from maximum permissible ABC. **The Team agreed with the authors' recommended model (Model m24) and the change from ADMB to RTMB. The Team agreed with the authors' recommended ABCs and OFLs from m24, with no reduction from maxABC.**

The author proposed an alternative apportionment method that was presented in September based on methodology that uses an area-specific model-based (VAST) approach instead of the design-based index. This method applies the same model structure as the VAST model used for the assessment survey biomass index. This alternative approach is identical to what was proposed for dusky rockfish. The Team raised concerns for adopting this approach for dusky rockfish apportionment and agreed that those concerns also apply to northern rockfish apportionment. Despite different resulting apportionments between these two stocks, the Team agreed an alternative apportionment method that more closely matches the average over time of the design-based apportionment method is desirable since there are no biological or conservation concerns with either method. Additional rationale and justification for not agreeing with the author recommended approach can be found in the dusky rockfish section of the Team report.

The Team recommended to use the status quo design-based (REMA) methods for apportionment for 2025 rather than the VAST approach. This is consistent with the Team recommendation for dusky rockfish.

Dusky Rockfish

Kristen Omori presented a full assessment for dusky rockfish which is assessed on a biennial schedule. Three models were presented:

1. The accepted base model from 2022 (m22.3a)
2. The base model with updated data through 2024 (m22.3a_base)
3. The author recommended model that consisted of two model changes in addition to data updates (m22.5a):
    a. Fitting the trawl survey biomass likelihood with a lognormal error structure
    b. Correcting the start year for the average recruitment calculation used for determining the abundance at the start of the first projection year and for use in the $B_{100\%}$ and $B_{40\%}$ calculations.

These model changes were brought forward in September to follow best practices and correct a coding oversight. Model changes for m22.5a (author recommended) resulted in lower spawning and total biomass estimates compared to the base model. Fits to data were acceptable, provided reasonable patterns of abundance, recruitment, and selectivity similar to the base model, and the retrospective Mohn's rho values were low.

Apportionments proposed by the author are based on an alternative methodology that uses an area-specific model-based (VAST) approach. This method applies the same model structure as the VAST model used for the assessment survey biomass index. This results in less variable interannual proportions across the management regions compared to using the design-based random effects model. The Team and the SSC previously recommended alternative avenues to explore for the additional split of the EGOA to the West Yakutat/SEO areas, but the authors expressed concerns with convergence issues and the need for additional exploration of the VAST model. Several GOA rockfish stocks apply the weighted survey average from the design-based estimator to estimate the EGOA proportions. The authors plan to present a unified methodology for all of these GOA rockfish stocks moving forward. Therefore, the authors recommended the West Yakutat/SEO split be done following the status quo method of the weighted survey average method from the design-based estimator. Following this proposed methodology, a substantial shift in 2025 ABC proportions occurs with increases in the EGOA and WGOA, and a large decrease in the CGOA.

Several members of the public commented on the large changes in apportionment among the management subareas that result from using this alternative (VAST) method and expressed concerns that the resulting apportionment could constrain fisheries in the CGOA. The Team subsequently discussed the implications of this in relation to conservation concerns with this stock and agreed there are no strong biological reasons or conservation concerns supporting this alternative method versus status quo methods for apportionment purposes and recognized through public testimony there may be significant economic impacts associated with this decision.

The Team noted that the VAST model explored for apportionment uses a model structure (i.e., a single intercept across regions in a year, and a spatio-temporal component that is not correlated over time) that has not been thoroughly explored for estimating spatially stratified subarea densities used for apportionment. As one possible alternative, the VAST model could be set up to have an annual intercept and a fixed effect for each region, and this would likely estimate an apportionment (averaged over time) that more closely matches the average over time of the design-based apportionment. Alternatively, the design-based apportionment did not account for spatially unbalanced sampling, i.e., the deep strata that

had not been sampled during recent years, or the lack of sampling in the eastern GOA in 2001. The Team recognized that both design- and model-based apportionment methods have pros and cons but agreed that the model-based index of abundance using VAST may be a useful tool to pursue for apportioning this stock given more research.

The author recommended model was model m22.5a with no reductions from maximum permissible ABC. **The Team agreed with the author's recommendation (Model m22.5a) and had the following additional recommendations and notes:**

- **The Team disagreed with the author recommended method for apportionment and instead recommends the status-quo (design-based) method for apportionment for 2025** since alternative VAST modeling approaches may provide a better match between averages over time between the design-based apportionments and the model-based apportionments.
- The Team notes that research could explore alternative VAST model structures that would perform well for determining apportionment.

Demersal Shelf Rockfish

Caitlin Stern gave an overview of the changes to assemblages and the associated tiers: DSR in Western GOA - Central GOA - West Yakutat (WG/CG/WY) is Tier 6; DSR in SEO is in Tier 6 (except yelloweye rockfish), and yelloweye rockfish (YE) in SEO is in Tier 5 and assessed using a two-index multi-area random effects model (REMA). There were several updates to input data including updated ADFG ROV survey data for NSEO and EYKT and updated IPHC survey data for 2022 and 2023; because of staffing, equipment and funding, no ROV surveys were conducted in 2024 nor currently planned for future years.

A major change in the assessment is that it now includes DSR species in WG/CG/WY, which were previously assessed as part of the GOA other rockfish stock complex; all of these species are managed as Tier 6. The biggest methodological change was the YE natural mortality value, which was changed from 0.02 to 0.044. In addition, the authors standardized the IPHC longline survey CPUE index and changed the CPUE units from numbers per hook to kg per hook. The CPUE index is used as a second index of abundance in the REMA model and is spatially stratified. The OFL and ABC for SEO are calculated by adding together the Tier 5-based quantities for SEO yelloweye rockfish and the Tier 6-based quantities for the other SEO DSR species in the complex.

The author noted that if the current OFL and ABC for CG/WG/WY DSR had been in place in 2022 and 2023, the CG/WG/WY DSR catches would have exceeded the ABC. Members of the public commented that pre-2020 catches should be examined because these would have been lower and not exceeded ABCs.

The Team discussed the IPHC CPUE standardization and noted that issues related to hook competition were ignored. Consequently, **the Team recommended that this could be addressed by treating the data as compositional data and using information about total catch of other species and examining empty hooks for target and non target species.**

The Team also discussed that because ROV data collection is not currently planned, the IPHC longline CPUE will increase in relative importance, thus motivating re-examination of the standardization methods. The IPHC has also dropped some of the survey stations in the SEO area. As this may influence estimates, **the Team recommended examining the effect of this survey effort reduction on the catch estimates and compositions.** The Team further discussed that using a spatiotemporal model for IPHC CPUE index standardization may be preferable to using the GAM approach that was recommended by the CIE review.

The authors changed the value of natural mortality from 0.02 to 0.044 based on a recommendation from a 2023 CIE review. The ABC for yelloweye rockfish would have increased in the previous value of natural mortality due to the increased IPHC biomass estimate. The authors noted elevated risk scores for all categories except for environmental/ecological considerations and recommended reducing the SEO DSR ABC by 20% due to concerns about more rapid changes in the estimated biomass than have ever been seen previously, uncertainty in the survey biomass estimates, and lack of ADFG ROV survey data for 2024 as well as in the future. The lack of ROV information in the future may necessitate managing SEO yelloweye rockfish in Tier 6 if no reliable survey estimates are available. Additionally, accounting for how catch may affect the estimated biomass may be useful and provides motivation for continued work on a surplus production model. The authors noted increased concern for fishery performance, although the Team noted that this was based on increased recent bycatch rather than what the fishery information indicates about stock status. The overall level of risk for the CG/WG/WY DSR was level 1 with no recommendation by the authors for an ABC reduction.

The Team expressed concern for the large increase in natural mortality and discussed alternatives. The historically used value of M = 0.02, is based on a catch-curve analysis of yelloweye rockfish age data grouped into 2-year intervals (to avoid zero counts) between the ages of 36 and 96 (Green et al. 2015) and was previously recommended for this species. The Team also noted a newly published paper on a phylogenetically informed method for estimating M based on longevity and/or growth data that could be applied to this stock and compared to other methods (Thorson 2024). The PT concluded that more exploration of alternative methods for calculating M for SEO yelloweye rockfish is warranted before such a large shift away from M = 0.02 is recommended. Given these concerns, **the Team recommended continuing to use M = 0.02 for yelloweye rockfish instead of the M = 0.044 value recommended by the author based on the CIE review**. The Team noted that, because SEO yelloweye rockfish is managed as a Tier 5 stock, with F_OFL = M and F_ABC = 0.75 * F_OFL, a change in the value of M has a large impact on reference points and must be thoroughly vetted.

The Team disagreed with the authors' recommended ABC/OFL for SEO yelloweye rockfish that included a 20% reduction in maxABC based on the risk table analysis. Instead, The Team recommended using a natural mortality value of 0.02 applied to the new standardized IPHC CPUE index for determining maxABC/OFL for 2025. The Team agreed with the author's recommended ABC/OFLs for the remaining Tier 6 Southeast Outside and WG/CG/WY species.

Thornyhead Rockfish

Kevin Siwicke presented a full operational stock assessment for the shortspine and longspine thornyhead complex, which is assessed on a biennial cycle with operational assessments in even years and is managed as a Tier 5 stock. The model uses the random effects model using the REMA package, fits to bottom trawl survey for shortspine as an absolute abundance (i.e., catchability coefficient of 1) for nine values in each year (i.e., three regions and three depth strata per region) with a random-walk process on changes in log-biomass per region (when summing across depth strata). It also fits to the longline Relative Population Weights (RPW) for shortspine using three values per year (one in each region when summing across depth strata) and estimating a catchability coefficient.

The assessment includes new bottom trawl and longline survey data from 2023 (no longline survey occurred in 2024), and also compares results when estimating a separate process-error variance parameter for each region, against an alternative model that estimates a single process-error variance parameter across all three regions. The latter was recommended by the SSC and is new in this assessment cycle.

The Team discussed potential extensions of the random walk model (and associated REMA package), including using a first-order autocorrelation with AR1 parameter derived from life-history information, and the potential to incorporate fishery catches to better predict interannual changes in biomass.

The Team agreed with the author's recommendation (Model m24.2) with no reductions from maximum permissible ABC and had the following additional recommendations:

- The Team notes that there has been a decrease in RPN/RPW in the longline survey in all three regions, and a similar (but less definitive) decline in the bottom trawl survey (primarily evident in the western GOA). The Team cautioned this could indicate a concerning trend considering catches are low and **recommended tracking further changes in thornyhead population levels over the coming cycles.**

Other Rockfish

Kristen Omori presented an operational update assessment for other rockfish which is assessed on a biennial schedule. The last operational full assessment was conducted in 2023. However, the operational update assessment was provided this year as a result of alterations to the species assignments to the GOA other rockfish complex. The other rockfish stock complex beginning with this year's assessment consists of twenty non-target rockfish species (*Sebastes* spp.) that are managed in three tiers (4, 5, 6). Recommendations to remove the seven demersal shelf rockfish (DSR) species previously assessed in the other rockfish complex in the combined W/C/WYAK areas to a separate W/C/WYAK stock complex was approved for the 2024 assessment cycle for implementation in the 2025 fisheries. The next operational assessment is scheduled for 2025. The other rockfish stock complex OFL and ABC are the sum of the recommendations for the Tiers 4, 5, and 6 species.

There were no changes to the assessment methodology. However, the modifications in the species composition of the GOA other rockfish complex, specifically in Tier 6 (decreasing from twenty-one species to fourteen species), changed the resulting OFL and ABC. Harvest specifications for Tier 6 are based on the maximum catch from 2013 to 2022 for each species.

There was clarification that there were no changes in Tier 6 catches, but differences are due to removal of DSR species from the other rockfish stock complex.

Apportionments of ABC for Tier 4 and Tier 5 species are based on the random effects model fit to the area-specific REMA biomass estimate and subsequent proportions of estimated biomass by area were calculated. The split fractions for delineating the biomass between WYAK and SEO portions of the EGOA are calculated at the species and tier levels using a weighted average.

The Team agreed with the authors' recommendations for OFL and ABC with no reduction from maximum permissible ABC. The Team also agreed with the recommended apportionments.