Western Pacific Regional Fishery Management Council

DRAFT Report of the Main Hawaiian Islands Deep 7 Bottomfish P* Working Group Meeting

May 7, 2024, 9:00 am to 12:00 pm

Western Pacific Regional Fishery Management Council Office

1. Introductions

Jason Helyer, Main Hawaiian Islands (MHI) Deep 7 bottomfish P* Working Group Chair, opened the meeting at 9:05 am, reviewed meeting protocols, and invited members to introduce themselves Members in attendance included Pua Borges (Pacific Island Regional Office Sustainable Fisheries Division, PIRO SFD), Eva Schemmel, John Syslo, Marlowe Sabater (Pacific Island Fisheries Service, PIFSC), Bryan Ishida (Hawaii Division of Aquatic Resources, HDAR), Clay Tam, Gil Kualii, Roy Morioka, Ed Watamura, Amanda Padilla, Abraham Apilado Jr., Nathan Abe, Len Nakano, and Craig Severance.

Others in attendance included Zach Yamada and Thomas Remington.

Working Group members observed a moment of silence for the passing of Jonathan Hurd.

2. Recommendations from previous Council meetings

Zach Yamada, Council staff, provided an overview of the Council recommendation. At its 198th meeting in March 2024, the Council received the Main Hawaiian Island (MHI) Deep 7 Bottomfish Fishery Benchmark Stock Assessment, accepted it as the best scientific information available, and directed staff to convene the P* (risk of overfishing) Working Group to quantify the scientific uncertainties in the assessment to set the acceptable biological catch (ABC) and develop potential annual catch limit (ACL) alternatives for initial action at its 199th meeting in June 2024.

3. Overview of the P* process

Jason Helyer, Working Group Chair, provided an overview of the P* process. The goal of the process is to create a precautionary buffer to ensure that overfishing does not occur. As catch in future harvest scenarios is reduced, the probability of overfishing decreases. The overfishing limit (OFL), which corresponds to a probability of overfishing of 0.5 (or 50 percent), is the starting point and the P* process will reduce this probability of overfishing to determine a catch level at which the ABC may be set.

4. Report on 2024 Benchmark Stock Assessment

John Syslo, NMFS PIFSC, provided the report of the 2024 MHI Deep 7 Bottomfish Benchmark Stock Assessment. Because this assessment is a benchmark, PIFSC evaluated the complete assessment process, including data inputs, standardization approaches, and model structure. Similar to the previous assessment, the deep 7 complex was assessed as a single stock within the MHI. Data utilized included CML catch and effort information, non-commercial (unreported) catch data, biological data, and fishery-independent survey data. Updates to the assessment included: a reevaluation of the contribution of unreported catch and use of Hawaii Marine Recreational Fishing Survey (HMRFS) information, improvements to catch per unit effort (CPUE) standardization of commercial marine license (CML) and the bottomfish fishery-independent survey (BFISH) data, and a new production model with new parameterization and different prior assumptions. While there were many changes to the 2024 assessment, the status of the Deep 7 complex was found to be not overfished with no overfishing occurring, similar to the previous assessment.

Uncertainty was characterized in the new benchmark assessment via the Bayesian Biomass Dynamic Model. Less informative priors allowed model results to be driven more by the data but introduced retrospective bias. Because future catch projections (probability of overfishing table) did not consider retrospective bias, WPSAR recommended additional buffers be considered when setting catch limits to address uncertainty not characterized in the final assessment model.

5. Working group scoring session

a. Assessment information

The assessment information dimension was scored in two-stages. First, a general evaluation of the Deep 7 assessment with regards to the amount and quality of information considered as well as the assessment approach was used to scale the scores from subsequent assessment aspects. The working group reached consensus on the same 0-2 scoring category as the previous assessment.

Next, the working group addressed the seven assessment aspects, scoring each aspect from 0 (not captured in the assessment) to 1 (captured in the assessment).

Reliable Catch History

PIFSC Stock Assessment (SA) provided a preliminary score of 0.5 for reliable catch history because non-commercial catch histories rely on ratio estimators with an assumption that the relationship between commercial and non-commercial catch is constant through time.

The working group discussed the non-commercial catch data at length. Multiple group members voiced concerns and skepticism about the validity of non-commercial catch estimates. One member reminded the group of the long history of documented concerns with non-commercial Deep 7 catch by the Council's SSC and noted the continual challenge of understanding how non-commercial catch estimates are calculated.

A working group member noted recent efforts to improve non-commercial catch estimates and asked how changes to the ratio estimators would affect projected harvest scenarios in the risk of overfishing table; especially if new information suggested the non-commercial sector is not catching as much fish as assumed. Syslo explained that the amount of biomass predicted by the assessment model is dependent on the catch. If the total catch in the model is reduced by 25%, there would be a decrease in biomass estimated by the model.

The working group also discussed decreased participation in the fishery due to fisher age and reduced economic incentives related to market changes following the closure of the Northwest Hawaiian Island (NWHI) bottomfish fishery, as well as under-reporting of commercial catch. Additional topics also discussed included: general questions about the Deep 7 complex and assessment history such as why the seven species were chosen and why a grouper was included while other species such as kahala were not. The group noted that many of the general topics raised in discussion should be addressed with relevant working groups as part of the research track for the next Deep 7 benchmark assessment.

The working group reached a consensus on a 0.5 score for reliable catch history. The group recognized the disconnect between fishermen and the science. A score of 0.5 acknowledges that the assessment considered both commercial and non-commercial data and reflects uncertainty of non-commercial and unreported catch.

Standardized CPUE

PIFSC SA provided a preliminary score of 0.0 for standardized CPUE because fishery-dependent and fishery-independent CPUE series were standardized using the best practices and available information.

The working group discussed several topics related to fisheries dependent CPUE including how a trip is defined, the decision to base CPUE on pounds versus pieces caught, whether temporal change in the size of fish caught is captured by CPUE trends. PIFSC SA explained that CPUE was calculated based on pounds per trip. Trip length was determined by the number of days, and estimated distance traveled. It was challenging to incorporate pieces of fish because each species has different growth and weights at length. Number of pieces becomes more important for single-species models because it helps inform size compositions, but not something that can incorporated into a biomass dynamic model.

Additional discussion on fisheries dependent CPUE included: how fisher experience, gear, method (anchor versus drift), day versus night, current, as well as economic and ecological factors, and spatial areas affect catch rates. PIFSC SA explained that the CPUE standardization considered different islands, reporting areas, and individual fishers. The previous assessment used the cumulative experience of fisher as a variable, but the current assessment found issues with the variable. Instead, the current assessment only considered the “core fleet”, the top 30% of fishers responsible for 90% of catch, for CPUE standardization.

The group briefly discussed the fisheries independent (BFISH) data noting that the survey protocols are more similar to recreational fishing.

The working group scored the Standardized CPUE aspect a 0 and noted the importance of continued collaboration between fishers and scientists to ensure CPUE standardizations accurately reflect fishery trends.

Species-Specific Data

PIFSC SA provided a preliminary score of 0.5 for the species-specific data aspect. While the assessment incorporated species-specific life history information, the aggregations of six snapper and a grouper into a complex merited a partial score. The working group gave the species-specific aspect a score of 0.5.

All Sources of Mortality Account for

PIFSC SA provided a preliminary score of 0.5 for the mortality aspect because mortality from discards, predation, and under-reporting was not accounted for in the assessment model.

The working group discussed depredation reporting. PIFSC SA considered adding depredation to the assessment, but challenges related to reporting consistency prevented the inclusion of depredation in the most recent assessment.

The working group gave the mortality aspect a score of 0.5 and noted the importance of continued monitoring and communication to the fishing community about depredation.

Fishery Independent Survey

PIFSC SA provided a preliminary score of 0.0 for the fishery independent survey aspect because BFISH was included in the stock assessment model.

The working group noted that BFISH surveys were conducted by fishers but reiterated that survey protocols were more similar to recreational fishing as opposed to commercial deep 7 fishing. A member inquired about how much weight was given to the fishery independent survey in the assessment model. PIFSC SA explained that there are 70 years of fishery dependent data and only seven years of BFISH data. The difference in time series length of the two data sets results in the fisheries dependent data receiving more weight in final assessment results.

The working group gave the fishery independent survey aspect a score of 0 for efforts to develop the BFISH survey and incorporate results into the stock assessment. However, the group recognized the need to improve the BFISH survey to better reflect fisher knowledge and improve survey results.

Tagging Data

PIFSC SA provided a preliminary score of 1.0 because no tagging data was included in the assessment. The working group reached consensus on a score of 1.

Spatial Analysis

PIFSC SA provided a preliminary score of 0 for the spatial analysis aspect because both fishery-dependent and -independent indices of abundance included space. The fishery-independent abundance index (based on BFISH) was standardized using a spatially explicit approach (latitude and longitude). The fishery-dependent abundance index included spatial areas from commercial catch reports and weighted results by spatial area.

The working group discussed differences in the abundance of deep 7 as well as fishing effort across islands in the MHI and through time. One member raised a question about assessing Deep 7 on an archipelagic scale referencing National Standard 3 and whether the NWHI should be considered in the assessment model. The group reached consensus on a score of 0 for spatial analysis while recognizing the need to explore fish catch and effort at the county level in future work.

Assessment Information Score

The group reached consensus on all seven assessment aspects with final scores noted in Table 1. The sum of the seven assessment aspect scores was 2.5 which had a scaled score equivalent of 0.7 (rounded up to 1). The total percent reduction score for the assessment information dimension was 1.

Table 1 2024 Assessment aspects scores.

Assessment Aspects (AAs)	**Score**
Reliable catch history	0.5
Standardized CPUE	0
Species-specific data	0.5
All sources of mortality accounted for	0.5
Fishery independent survey	0
Tagging data	1
Spatial analysis	0
SUM	2.5
Scaled assessment score (max =	**0.7**

2)

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b. Uncertainty characterization

The working group considered how uncertainty was characterized in the deep 7 stock assessment. PIFSC SA provided a preliminary score of 5.0 because uncertainties related to retrospective bias were not carried forward in projections of harvest scenarios (risk of overfishing table).

The group reached consensus on a score of 5.0 for uncertainty characterization.

c. Stock status

PIFSC SA noted for the entire time series, the Deep 7 bottomfish complex was not overfished or experiencing overfishing and that PIFSC SAP is highly confident in the stock status in 2023.

The working group discussed the historical stock status of the deep 7. A work group member noted that stock status was provided a score of 1 in the previous P* because some parts of time series were considered to be experiencing overfishing. However, the new assessment did not indicate such a pattern and recommended a score of 0.

The working group also discussed individual species and the aggregation of species in the assessment in the context of stock status. One member did not agree with the high confidence in the stock assessment results noting the aggregation of species in the complex means that the results are mainly driven by the main targets (Opakapaka and Onaga). The member noted that much less is known about non-target species such as hapuupuu, gindai, and lehi.

The working group reached consensus on a score of 0, recognizing the need to continue dialogue on assessing the deep 7 as a complex or as individual species.

d. Productivity and susceptibility

Productivity and susceptibility components of this P* dimension were discussed separately.

Productivity

Eva Schemmel, PIFSC Life History Program Lead, provided an overview of the updated scores for productivity of the Deep 7. She said the stock assessment has some life history parameters taken from the assessment when available. Schemmel noted that the stock assessment uses life history information from the MHI when possible and thanked fishers that have contributed samples for life history studies.

Each species in the deep 7 complex was scored using the attributes from Patrick et al. (2009). Individual species and attributes were scored according to the rubric in Table 2.

Table 2 Productivity attributes with scoring rubric.

Productivity attributes	**High (0)**	**Moderate (5)**	**Low (10)**
Rate of population increase - r	>0.5	0.16-0.5	<0.16
Maximum age	<10 yrs	10-30 yrs	>30 yrs
Maximum size	<60cm	60-150cm	>150cm
von Bertalanffy growth coefficient (k)	>0.25	0.15-0.25	<0.15
Estimated natural mortality	>0.40	0.20-0.40	<0.2
Measured fecundity	>10e4	10e2-10e3	<10e2
Breeding strategy	0	between 1 and 3	≥4
Recruitment pattern	high recruitment success	moderate recruitment success	infrequent recruitment success
Age at maturity	<2 yrs	2-4 yrs	>4 yrs
Mean trophic level	<2.5	between 2.5 and 3.5	>3.5

The working group discussed the maximum size and meat trophic level attributes. PIFSC LH explained that maximum size of fish comes from decades of sampling and could change over time. There are 15 years of biosampling in Hawaii and that continued collaboration with fishers will help improve knowledge gaps in the life history of Deep 7 species. Regarding mean trophic level, PIFSC LH explained that higher values correspond to being higher on the food chain. A working group member added that where the fish are in the food chain depends on what life stage they are in noting that some juveniles deep 7 species are often found nearshore proximate to freshwater,

The attribute scores for each species were then averaged to get the productivity scores per species (Table 3).

Table 3 Average productivity scores for Deep 7

Species	**Productivity Scores**
A. rutilans (lehi)	6.17
P. filamentosus (opakapaka)	6.07
E. coruscans (onaga)	7.17
P. seiboldii (kalekale)	5.25
E. carbunculus (ehu)	5.42
P. zonatus (gindai)	5.42
H. quernus (hapuupuu)	7.42

Average	**6.13**

Susceptibility

The Susceptibility Attributes were scored by the bottomfish fishermen according to the scoring rubric in Table 4.

The working group reviewed the susceptibility scores based on the 2018 P* MHI Deep 7 before reaching consensus on updated scores. Final averaged scores for each species are presented in Table 5.

Table 4 Susceptibility attributes with scoring rubric.

Susceptibility attributes	**Low (0)**	**Moderate (5)**	**High (10)**
Areal overlap	<25%of stock occurs in the area fished	25%-50% of the stock occurs in the area fished	>50% of the stock occurs in the area fished
Geographic concentration	stock distributed in > 50% of its range	stock distributed in 25-50% of its range	stock distributed in <25% of its range
Vertical overlap	<25%of stock occurs in the depths fished	25%-50% of the stock occurs in the depths fished	>50% of the stock occurs in the depths fished
Seasonal migrations	Seasonal migrations decrease overlap w/ the fishery	Seasonal migrations do not substantially affect the overlap w/ the fishery	Seasonal migrations increase overlap with the fishery
Schooling/ aggregation	Behavioral responses decrease the catchability of the gear	Behavioral responses do not substantially affect the catchability of the gear	Behavioral responses increase the catchability of the gear
Morphology affecting capture	Species shows low selectivity to the fishing gear	Species shows moderate selectivity to the fishing gear	Species shows high selectivity to the fishing gear
Desirability/value of the fishery	Stock is not highly valued or desired by the fishery	Stock is moderately valued or desired by the fishery	Stock is highly valued or desired by the fishery

Management strategies or current regulations on the species	Targeted stocks have catch limits and other local management regs; regs fully enforced	Targeted stock have catch limits and other local management regs but no strong enforcement	No regulations both at federal and local side hence no enforcement needed
Fishing rate relative to M	<0.5	0.5-1.0	>1
Biomass of spawners (SSB) or other proxies	B is 40% of B0 (or max observed from time series of biomass estimates	B is between 25%-40% of B0 (or maximum observed from time series of biomass estimates	B is <25% of B0 (or maximum observed from time series of biomass estimates)
Survival after capture and release	Probability of survival >67%	Probability of survival between 33-37%	Probability of survival <33%
Fishery impact to EFH or habitat in general	Adverse effects absent, minimal or temporary	Adverse effects more than minimal or temporary but are mitigated	Adverse effect more than minimal or temporary and are not mitigated

Table 5 Average susceptibility scores for Deep 7

Species	**Susceptibility Score**
A. rutilans (lehi)	2.27
P. filamentosus (opakapaka)	3.86
E. coruscans (onaga)	3.64
P. seiboldii (kalekale)	2.27
E. carbunculus (ehu)	2.27
P. zonatus (gindai)	2.05
H. quernus (hapuupuu)	2.27
Average	**2.66**

Productivity & Susceptibility

Productivity and susceptibility scores were averaged to calculate the final score of -4.4 for this P* dimension (Table 6)

Table 6 Summary of the Productivity and Susceptibility (P-S) scores the deep 7 bottomfish complex.

Attributes	**Deep 7**
Productivity	6.13
Susceptibility	2.66
Average P-S	**-4.4**

6. Public Comment

There were no request for public comment.

7. General Discussion

There was no general discussion captured under this section of the agenda.

8. Summary of scores and P* report

The P* working group finalized the scores for the MHI Deep 7 complex assessed for all 4 dimensions listed in Table 7. The total reduction score was 10. The highest risk level that the MHI Deep 7 bottomfish fishery can be managed at 40 percent risk of overfishing which correlates to 498,000 lb in 2027.

Table 7 2024 P dimensions and scores.*

Dimension	**Reduction Score**
Assessment information	0.7
Uncertainty characterization	5
Stock status	0
Productivity-Susceptibility	4.4
Final P* Score	**10**

The meeting adjourned at 12pm (HST).