



Guam P* Working Group Meeting

January 31, 2020

9:00 am to 12:00 pm

Micronesia Room, Hilton Resort and Spa
Tumon, Guam

Participants: Chelsa Muña-Brecht (Dept. of Ag.), Tino Aguon (DAWR), Tom Flores (DAWR), Brent Tibbatts (DAWR), Frank Camacho (Univ of Guam), James Borja (Bottomfish fisher, AP), Ken Borja (Bottomfish fisher, AP), Eric Cruz (PIFSC), John Syslo (PIFSC)

Council staff: Marlowe Sabater, Felix Reyes

DRAFT REPORT

1. Introductions

Council staff opened the meeting at 9:30 am. Staff welcomed the participants and highlighted the importance of the participation of the local agencies and the local bottomfish fishing community. Processes such as the P* Analysis is where the local agency and the fishing community can participate in the federal decision making process. The scores from the working group will be used by the SSC to set the Acceptable Biological Catch.

2. Recommendations from previous Council meetings

In October 2019, the Pacific Island Fisheries Science Center delivered the peer-reviewed benchmark stock assessment for the bottomfish fisheries in American Samoa, Guam, and CNMI. The SSC deemed this stock assessment as best scientific information available. The Council directed staff to conduct the P* and SEEM analysis. Council staff formed working groups for CNMI and Guam to conduct the P* and SEEM analysis. The task of the Guam P* working group is to quantify the scientific uncertainty in the benchmark assessment.

3. Overview of the P* process

Council staff provided an overview of the P* process. The Fishery Ecosystem Plans required the Council to revisit the P* analysis once new information becomes available. The P* process determines the risk level to which the fishery will be managed based on the scientific uncertainties surrounding the stock assessment and the stock it described. There are 4 dimensions in the P* analysis: 1) Assessment Information; 2) Uncertainty Characterization; 3) Stock Status; and 4) Productivity-Susceptibility. Each dimension has criteria scored by working group members. The total scores will be deducted from the 50% risk of overfishing described in Langseth et al 2019. The catch that corresponds to the final P* corresponds to the potential Acceptable Biological Catch that the SSC will specify at its 135th Meeting in March 2020.

4. State of the Science for the Territory Bottomfish: Report on 2019 Benchmark Territorial Bottomfish

John Syslo, PIFSC, presented the pertinent information from the Guam benchmark stock assessment. The presentation focused on the information used in the stock assessment, the comparison of the changes in the current benchmark versus the previous update. Included in the presentation are the pertinent results and the catch projections. Syslo highlighted the difference between the 2019 benchmark versus the 2015 update. There was a change in the species composition, non-use of the fishery independent point estimate of MSY, and changed the data filtering method to include low catch and zero catch trips.

Staff asked about how far is the 2017 stock status estimate from getting out of the overfished condition. It all depends on the next batch of data for the assessment update. There has to be additional data sources that should be used in the next assessment which would include the fishery independent surveys (e.g. botcam). PIFSC staff stated that the last NOAA cruise in Guam cameras were dropped at around 30 m. Although the mapping shows the dots of each drop, the exact spots were unknown. The pilot camera surveys in 2010, 2012, and 2014 were not used in the assessment.

5. Working group re-scoring session

a. Assessment information

The Assessment Information dimension pertains to the scientific information that was utilized in the assessment. The working group selected which level of assessment category the 2019 benchmark assessment belongs to.

Assessment Information Description	Score
Perfect. Quantitative assessment provides estimates of exploitation and B; includes MSY-derived benchmarks	0.0
Quantitative assessment provides estimates of exploitation and B; includes MSY-derived benchmarks; no spatially-explicit information	2.0
Good. Measures of exploitation or B, proxy reference points, no MSY benchmarks; some sources of mortality accounted for	4.0
Relative measures of exploitation or B, proxy reference points, absolute measures of stock unavailable	6.0
No benchmark values, but reliable catch history	8.0
Bad. No benchmark values, and scarce or unreliable catch records	10.0

The working group determined based on the information presented in the assessment that the new benchmark is a qualitative assessment that provides estimates of fishing mortality and biomass. Since there is insufficient spatial resolution in the data input, there is no spatially explicit information used in the assessment. The working group then scored the various assessment aspects to determine where exactly between 2 and 4 the assessment information falls. Since the P* analysis was already conducted in CNMI and the scores are available, the Guam P* working group reviewed the Assessment Information dimension scores since there is only one modeling framework used for both areas.

The assessment aspects are:

- Reliable catch history
- Standardized CPUE
- Species-specific data

- All sources of mortality accounted for
- Fishery independent data
- Tagging data
- Spatial analysis

Reliable catch history: the working group noted that the term reliable is subjective. Since the assessment used both the creel survey and the commercial receipt book data, this raises serious concerns regarding the completeness of the data, whether it captures a significant portion of the fishery. The conclusion was that the data is incomplete and is capturing mostly the commercial segment of the fishery. The working group believed that the data from the creel is under estimated. The working group scored it a 0.5 reduction.

Standardized CPUE: the CPUE series used for CNMI was standardized as compared to the previous assessment which used a nominal CPUE. The working group did not dock a reduction and scored it a 0.

Species-specific data: The working group discussed the method for incorporating life history information for the 13 species. The input value for the r parameter was 0.46. The Monte-Carlo simulation tested the different life history levels ranging from the slow to fast growing species and averaged the results. Since the assessment was done on a complex and the life history input parameter was an average of the available information for the species in the complex, the working group scored a 1 point reduction.

All sources of mortality accounted for: all of known sources of uncertainty were accounted for in the assessment. The model is able to adjust the range of the uncertainties particularly from the varying life history parameters for the natural mortality. Fishing mortality was also accounted for. There was no reduction for this assessment aspect.

Fishery independent data, tagging data, and spatial analysis: none of these information were available for the benchmark assessment. There was a 1 point deduction for each of these assessment aspects. There were no spatial analyses because there is insufficient spatial information in the interview data. Fishermen stated that they do not reveal their fishing location thus the information from the creel is not reliable.

The total assessment aspect points was 4.5 and was scaled equivalent was 3.3. The total percent reduction score for the Assessment Information Dimension was 3.3.

b. Uncertainty characterization

The working group scored this dimension as a 2.5 percent reduction. Uncertainties were carried forward into the projections. The uncertainties were also characterized in the estimation of the stock status.

Uncertainty Characterization Description	Score
Complete. Key determinant – uncertainty in both assessment inputs and environmental conditions included	0.0
High. Key determinant – reflects more than just uncertainty in future recruitment	2.5
Medium. Uncertainties are addressed via statistical techniques and sensitivities, but full uncertainty is not carried forward in projections	5.0
Low. Distributions of F_{msy} and MSY are lacking	7.5
None. Only single point estimates; no sensitivities or uncertainty evaluations	10.0

c. Stock status

The benchmark assessment showed that the BMUS complex in Guam is overfished but not subject to overfishing. The working group looked at where the 2017 stock status is relative to the MSST and MFMT:

		Biomass			
		Above B _{MSY}	Above MSST	Near* MSST	Below MSST
Fishing Mortality	Below MFMT	0	2.0	5.0	8.0
	Near* MFMT	1.0	3.0	6.0	9.0
	Above MFMT	2.0	4.0	7.0	10.0

PIFSC scientist calculated that the 2017 estimate was 19 percent from the MFMT threshold and the B is 43 percent below the B at MSY. The working group scored this dimension as a 9 percent reduction.

d. Productivity and susceptibility

The productivity attributes were scored by the Life History Program of the Pacific Island Fisheries Science Center. Each of the 13 species in the complex was scored using the attributes from Patrick et al. 2009. The following are the productivity attributes:

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

Scores of 0, 5, or 10 are given to each species. The attribute scores for each species were averaged out to get the productivity scores per species. The productivity scores for Guam are similar to the CNMI scores because we assumed that the distance between Guam and CNMI will not significantly change the biology of the 13 BMUS. Below are the species productivity scores:

Species	Productivity scores
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<i>Caranx lugubris</i> (black trevally)	4.5
<i>Aphareus rutilans</i> (lehi)	6.15
<i>Etelis carbunculus</i> (ehu)	6.15
<i>Etelis coruscans</i> (onaga)	6.45
<i>Pristipomoides auricilla</i> (yellowtail snapper)	4.9
<i>Pristipomoides filamentosus</i> (opakapaka)	5.65
<i>Pristipomoides flavipinnis</i> (yelloweye opakapaka)	5.2
<i>Pristipomoides seiboldi</i> (kalekale)	5.15
<i>Pristipomoides zonatus</i> (gindai)	5.35
<i>Caranx ignobilis</i> (giant trevally)	4.8
<i>Lethrinus rubrioperculatus</i> (red gill emperor)	3
<i>Lutjanus kasmira</i> (blue lined snapper)	4.1
<i>Variola louti</i> (lunar tail grouper)	5.2
Average	5.12

The final productivity score was 5.12 which is the average of the score of all species in the complex.

The Susceptibility Attributes were scored by the bottomfish fishermen. The fishermen reviewed the previous susceptibility scores from the 2015 P* analysis. Below are the susceptibility attributes that the working group scored:

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

The areal overlap of the BMUS stock with the area fished was mostly scored as moderate (5) and only the shallower species scored as high (10). This is because the shallow species are found in most areas fished and is easier to catch. The red gill emperors are common even on the outer banks. There are more shallow water bottomfishing than deep bottomfishing. The geographic distribution is scores mostly low (0) except for the giant trevally. There is very little concentration of the deep and shallow bottomfish on the range of Guam fishing grounds. The vertical overlap was scored mostly with moderate with the species stratified on certain depths except for the black jack that traverses multiple depths. Bottomfish has ontogenetic migrations from shallow when they are juveniles and then go deeper when they become adults. The juveniles are being targeted by the recreational kaya fishermen but the Division is unaware how prolific this type of fishery is.

Seasonal migrations were scored moderate across the board. The working group noted that these species does not do significant seasonal migration. Similar to CNMI, what is seasonal is the ability to go out and fish where the peak occurs during the summer months. The temperature difference is very minimal to trigger massive migration. Schooling behavior is scored differently by species. Most of the deep species were scored as low (0) except for *P. auricilla* and *P. zonatus* which were scored 10 and 5, respectively. Shallow species were scores with moderate to high.

On the morphology affecting capture, all of the deep species are scored moderate (5) while the shallow were score with high. It is not because the fish has a certain morphological feature that affects the selectivity but for the shallow species, there are multiple gears that capture the same species whereas for the deep it is only the hook and line. Fishermen attested that some of the deep species have certain selectivity towards the bait used. Onagas can also be trained to bite to certain bait and technique.

The desirability is high (10) across the board for the deep species while for the shallow species the giant trevally, taape, and lyretail grouper are moderate. Lyretail are ciguatoxic to a certain size. The management strategy and regulation is moderate (5) across the board due to the weak enforcement.

PIFSC working group member calculated the fishing rate relative to M and scored it low (0) at 0.43. Biomass of spawners were also calculated and scored moderate at 0.27. The survival after capture and release were scored mostly low where the probability of

survival is greater than 67 percent. Lastly, the impact to EFH is considered low (0) across all species.

Below are the species level susceptibility scores:

Species	Productivity scores
<i>Caranx lugubris</i> (black trevally)	4.6
<i>Aphareus rutilans</i> (lehi)	3.3
<i>Etelis carbunculus</i> (ehu)	3.3
<i>Etelis coruscans</i> (onaga)	3.3
<i>Pristipomoides auricilla</i> (yellowtail snapper)	4.2
<i>Pristipomoides filamentosus</i> (opakapaka)	3.3
<i>Pristipomoides flavipinnis</i> (yelloweye opakapaka)	3.3
<i>Pristipomoides seiboldi</i> (kalekale)	3.3
<i>Pristipomoides zonatus</i> (gindai)	3.8
<i>Caranx ignobilis</i> (giant trevally)	3.3
<i>Lethrinus rubrioperculatus</i> (red gill emperor)	5
<i>Lutjanus kasmira</i> (blue lined snapper)	3.8
<i>Variola louti</i> (lunar tail grouper)	4.6
Average	3.78

The final susceptibility score was 3.78 which is the average of the score of all species in the complex.

The overall score for the Productivity and Susceptibility dimension is 4.45

6. Conclusion

The P* working group finalized the scores for all 4 dimensions:

Dimension	Score
Assessment information	3.3
Uncertainty characterization	2.5
Stock status	9.0
Productivity-Susceptibility	4.4

The total reduction score was 19 percent. The highest risk level that the CNMI bottomfish fishery can be managed will be at 31 percent risk of overfishing.