



American Samoa P* Working Group Meeting

April 16, 2020
10:00 am to 1:00 pm
WebEx Conferencing

Participants: John Syslo (PIFSC), Domingo Ochavillo (DMWR), Will Sword (AP Vice-chair), Howard Dunham (Council member), Sam Chong (Bottomfish fisherman)

Council staff: Marlowe Sabater, Nate Ilaoa

DRAFT REPORT

This report was sent out to the working group members for review.

1. Introductions

Council staff opened the meeting at 10:20 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 American Samoa to conduct the P* and SEEM analysis. The task of the American Samoa 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 136th Meeting in June 2020.

4. Working group re-scoring session

The Assessment Information and Uncertainty Characterization dimension scores are similar to the Marianas P* analysis because it utilized the same information and models for

American Samoa. The main difference is the Stock Status in which its overfished and experiencing overfishing for American Samoa which is an automatic 10 point reduction. The productivity and susceptibility scores are specific for American Samoa. The susceptibility scores were scored by fishermen on April 14, 2020, and were reviewed by the working group on April 16, 2020.

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 the Marianas and the scores are available, the American Samoa 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 Fmsy 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 American Samoa is overfished and 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	Below MFMT	0	2.0	5.0	8.0

Mortality	Near* MFMT	1.0	3.0	6.0	9.0
	Above MFMT	2.0	4.0	7.0	10.0

d. Productivity and susceptibility

The productivity attributes were scored by the Life History Program of the Pacific Island Fisheries Science Center. Each of the 11 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. Below are the species productivity scores:

Species	SCORES
Palu-gutusaliva - <i>Aphareus rutilans</i> (lehi)	6.15
Palu-malau - <i>Etelis carbunculus</i> (ehu)	6.15
Palu-loa - <i>Etelis coruscans</i> (onaga)	6.45
Palu`ena`ena - <i>Pristipomoides filamentosus</i> (opakapaka)	5.65
Palu-sina - <i>Pristipomoides flavipinnis</i> (yelloweye opakapaka)	5.2
Palu-ula, palu-sega - <i>Pristipomoides zonatus</i> (gindai)	5.35
Taufauli - <i>Caranx lugubris</i> (black trevally)	4.5
Asoama - <i>Aprion virescens</i> (gray jobfish)	5.6
Filoa paomumu - <i>Lethrinus rubrioperculatus</i> (red gill emperor)	3.25
Savane - <i>Lutjanus kasmira</i> (blue lined snapper)	4.1
Papa, velo - <i>Variola louti</i> (lunar tail grouper)	5.2
Average	5.23

The final productivity score was 5.23 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 B ₀ (or max observed from time series of biomass estimates)	B is between 25%-40% of B ₀ (or maximum observed from time series of biomass estimates)	B is <25% of B ₀ (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

Areal overlap:

Consensus from the participants that all the deep bottom fish that only 25-50 percent (score of 5) of the stock occurs in the fished area. They agreed the banks are rarely fished due to difficulty of smaller boats to make it that distance. For the shallow bottomfish they also agreed on a score of 5 for all species except for *L. kasmira* (savane). Their reasoning for having savane score of 0 was because the species is broadly distributed.

Geographic concentration

The participants agreed that most of the stock is localized. Their exception for the BMUS was *C. lugubris* (tafauli) which they said have a larger home range. They felt tafauli was more geographically scattered, having larger home range even though they don't move very much. In their discussion, they noted that many tafauli can be caught in a specific geographic area so most of the species cannot be caught over more than 50% of the range.

Vertical overlap

The participants were in agreement that for the deep bottomfish species, less than 25% of the stock occurs in the depths they are fished. Their exception to this with the six deep species was *P. zonatus* (palu-sina/palu-ula) which they felt 25% to 50% of the stock occurred in the depths fished. As for the shallow species, they felt the jacks occurred across the whole depth range and thus over half the stock occurs in the depths fished (score of 10). They scored *L. rubrioperculatus* (filoa) a 0 as less than 25% of the stock occurs in the depths fished. For the other shallow species, they concurred that between a quarter to half the species occur in the depths fished.

Seasonal migration/Fishing access

The participants agreed that there is no known seasonal migration with the exception of *A. virescens* (uku/asoama). They also were in agreement on the limitation of access during parts of the year when fishing deeper habitats was not possible due to rough conditions. They factored the lack of migration and access limitations due to conditions to come up with a score of 5 (not a substantial affect on the overlap of the fishery) for all species except *A. virescens* which they scored a 10.

Schooling/Aggregation

There was agreement that for all deep and shallow water species, a score of 5 was most appropriate. They felt that the species' behavioral responses had somewhat of an effect on catchability of the gear. They discussed hook sizes as part of their reasoning in giving a score of 5 to all 11 species.

Selectivity to gear

They discussed particular gear configurations allowing for consistent catch for species. They also talked about hook sizes and decided that all 11 of the species displayed moderate selectivity to fishing gear. They chose to give a score of 5 for all species in this attribute category.

Desirability/Value of the Fishery

The participants were in agreement on the top valued and desired fish of the species for businesses were the deep snappers – *A. rutilans* (palu gutu-siliva), *E. carbunculus*, (palu-malau) and *E. coruscans* (palu-loa) – and they gave a score of 10 for each of them. They also decided that there was moderate value for the remaining 8 species and assigned a value of 5 for each.

Management Strategies/Regularions

The fishermen all agreed that there were no ACLs and that enforcement was present, but somewhat lacking. They wanted to assign a value between moderate and high but closer to

moderate which would reflect the lack of ACLs and enforcement capacity. They decided to assign a value of 6 to all 11 species.

Below are the species level susceptibility scores:

Species	SCORES
Palu-gutusaliva - <i>Aphareus rutilans</i> (lehi)	3.83
Palu-malau - <i>Etelis carbunculus</i> (ehu)	3.83
Palu-loa - <i>Etelis coruscans</i> (onaga)	3.83
Palu`ena`ena - <i>Pristipomoides filamentosus</i> (opakapaka)	3.42
Palu-sina - <i>Pristipomoides flavipinnis</i> (yelloweye opakapaka)	3.42
Palu-ula, palu-sega - <i>Pristipomoides zonatus</i> (gindai)	3.83
Tafaui - <i>Caranx lugubris</i> (black trevally)	3.83
Asoama - <i>Aprion virescens</i> (gray jobfish)	4.25
Filoa paomumu - <i>Lethrinus rubrioperculatus</i> (red gill emperor)	3.42
Savane - <i>Lutjanus kasmira</i> (blue lined snapper)	3.42
Papa, velo - <i>Variola louti</i> (lunar tail grouper)	3.83
Average	3.72

The final susceptibility score was 3.72 which is the average of the score of all species in the complex.

The overall score for the Productivity and Susceptibility dimension is 4.5

5. Conclusion

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

Dimension	Score
Assessment information	3.3
Uncertainty characterization	2.5
Stock status	10.0
Productivity-Susceptibility	4.5

The total reduction score was 20 percent. The highest risk level that the American Samoa bottomfish fishery can be managed will be at 30 percent risk of overfishing.