WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

PRELIMINARY DRAFT

Specifying Acceptable Biological Catch and Annual Catch Limits for the Main Hawaiian Islands Crustacean and Precious Coral Fisheries

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1 Introduction

Fisheries for crustacean management unit species (MUS) and precious corals in federal waters of the exclusive economic zone (EEZ; generally 3-200 nmi) around the U.S. Pacific Islands are governed by one of four fishery ecosystem plans (FEP) developed by the Western Pacific Fishery Management Council (Council) and implemented by the National Marine Fisheries Service (NMFS) under the authority of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act or MSA). Three of the FEPs are archipelagic-based and include the American Samoa Archipelago FEP, the Hawaii Archipelago FEP, and the Mariana Archipelago FEP (which covers federal waters around Guam and the Commonwealth of the Northern Mariana Islands or the CNMI). The fourth FEP covers federal waters of the U.S. Pacific remote island areas (PRIA) which include Palmyra Atoll, Kingman Reef, Jarvis Island, Baker Island, Howland Island, Johnston Atoll, and Wake Island.

In accordance with the Magnuson-Stevens Act, the FEPs and their implementing regulations at 50 CFR 665.4, NMFS must specify, an annual catch limit (ACL) and implement accountability measures (AM) for crustacean and precious coral MUS, as recommended by the Council, and in consideration of the best available scientific, commercial, and other information about the fishery for that stock or stock complex. The ACL may not exceed the acceptable biological catch (ABC) recommended by the Council's Science and Statistical Committee (SSC). On May 5, 2021, NMFS specified final 2020 ACLs for Pacific Island crustacean and precious coral fisheries, and AMs to correct or mitigate any overages of catch limits. The ACLs and AMs were effective for fishing year 2020. Although the 2020 fishing year had nearly ended for most stocks, NMFS will evaluate 2017 catches against these final ACLs when data become available in mid-2020. The ACLs and AMs support the long-term sustainability of fishery resources of the U.S. Pacific Islands.

The foremost crustacean species groups harvested are those of the *Heterocarpus* deepwater shrimps (*H. laevigatus* and *H. ensifer*). The Main Hawaiian Island Kona crab fishery was not included here due to possessing its own individual catch limit specification document. The main gear types used to harvest these species are typically shrimp traps, loop nets and other miscellaneous traps (WPRFMC 2018).

The precious coral fisheries in the U.S. Western Pacific Islands are mostly comprised of any coral of the genus *Corallium* in addition to gold coral (*Gerardia* spp.) and black coral (*Antipathes griggi*, *A. grandis*, *A. ulex*). Only selective gear may be used to harvest corals in federal waters; the top gear for this species group is submersible (WPRFMC 2018). Regulations require a Western Pacific Precious Coral permit for anyone harvesting or landing black, bamboo, pink, or red corals in the U.S. EEZ of the western Pacific. The Papahānaumokuākea Marine National Monument prohibits precious coral harvests in the monument (Federal Register notice of final rule, 71 FR 51134, August 29, 2006). Regulations governing this fishery are in the CFR, Title 50, Part 665, Subpart F, and Title 50, Part 404 (Papahānaumokuākea Marine National Monument).

In addition, gold coral is currently under a moratorium in the Western Pacific region that is set to expire in 2018, and the Council recommended that the moratorium be extended to provide time

to implement other management options (e.g. ACL, prohibition, etc.). On June 14, 2018 (83 FR 27716) specified a final rule extending the region-wide moratorium on the harvest of gold corals in the U.S. Pacific Islands through June 30, 2023; this is the third sequential extension of the moratorium since its inception in 2008 (73 FR 47098).

1.1 Best Scientific Information Available

1.1.1 Deep Water Shrimp

In 2020, based on recommendations by the Council NMFS prepared a Categorical Exclusion (CE) based on the Environmental Assessment in 2017 describing specification multi-year annual catch limits (ACLs) and implement accountability measures (AMs) for each crustacean and precious coral stock or stock complex managed under the Hawaii FEP effective in fishing years 2019–2021 (NMFS 2017).

The Pacific Islands deepwater shrimp (*Heterocarpus laevigatus* and *H. ensifer*) initial assessment was first completed in the last 1980s by Tagami and Ralston (1988) for the MHI. The assessment involved depletion experiments, stratified random sampling of different deepwater shrimp habitats, and calculation of exploitable biomass using the Ricker equation (i.e. from Ricker 1975). The authors also generated an assessment of exploitable biomass a few years later (Ralston and Tagami 1992). There have been no new estimates of stock status for Western Pacific deepwater shrimp species since then. This report was used as a basis for the specification of ABC and ACL in 2012. No new information exists since then.

1.1.2 Precious Corals

Commercial fishery statistics for the last ten years are unavailable due to confidentiality, as the number of federal permit holders since 2007 has been fewer than three. As a result, there are no stock assessments for precious corals. Future reports will include data as resources and reporting confidentiality thresholds allow.

2 Specification for the Deepwater Shrimp Fishery

2.1 Current OFL, ABC, ACL Specification

2.1.1 Stock Status

Since there is no benchmark assessment available, stock status cannot be determined at this time. However, available information shows that the fishery is harvesting a small portion of the stock. In 2020, less than three individuals reported catching deepwater shrimp hence the data is confidential. However, taking the three year average of catch from 2017 to 2020, the reported catch of deepwater shrimp is 10,060 lb. This is comprise four percent of the ACL amounting and corresponds to 3.6 percent of the estimated MSY (Tagami and Ralston 1988) and two percent of the estimated exploitable biomass by Ralston and Tagami (1992).

2.1.2 Estimation of OFLs

When calculating an ABC for a stock or stock complex, the SSC must first evaluate the information available for the stock and assign the stock or stock complex into one of the five tiers. The SSC must then apply the control rule assigned to that tier to determine ABC.

For stocks like most precious corals and deepwater shrimp, which have estimates of maximum sustainable yield (MSY), but no current harvest, the ABC is to be calculated by the SSC based on the Tier 4 ABC control rule described in each FEP, which sets ABC as equal to 91% of the MSY estimate. As explained in the FEPs, the application of this control rule would result in a fishing mortality rate of 0.7 F_{MSY}, which would maximize yield while minimizing biomass impacts, and account for scientific uncertainty.

2.1.3 Current ABC Specifications

There is no OFL estimate for deepwater shrimp in Hawaii. According to the Ralston and Tagami (1988) Hawaii deepwater shrimp initial assessment, the MSY for Hawaii deepwater shrimp was estimated to be 275,575 lbs. At the 130th SSC meeting (83 FR 49368, October 1, 2018), the SSC applied the Tier 4 control rule (91% of MSY) to calculate the ABC. The ABC for deepwater shrimp is 250,773 lb (85 FR 26622, May 5, 2020).

2.1.4 Current ACL Specification

At its 174th meeting held October 23-25, 2018, the Council recommended setting the ACL for the Hawaii deepwater shrimp stock complex as equal to the ABC, which, as re-calculated by NMFS, is 250,773 lb. In recommending the ACL, the Council considered the average annual landings for the three approximately 10-year periods as shown in Table 3. The Council did not recommend reducing the ACL from the ABC for social, economic, ecological considerations or management uncertainty as described in the FEP of the Hawaii Archipelago, because average annual landings within each of three approximately 10-year periods are substantially lower than the MSY of 125 mt/yr (275,575 lb/yr) estimated by Ralston and Tagami (1988). Therefore, while setting the ACL equal to the ABC does not provide for consideration of management uncertainty, it is highly unlikely that catch would ever approach ACL based on the historical performance of the Hawaii deepwater shrimp fishery, and it is unlikely that the Hawaii deepwater shrimp stock complex would experience overfishing during the 2019-2021 fishing years.

2.2 Current Task for the SSC

<u>Setting the Acceptable Biological Catch</u>

The SSC's current task is to specify the ABC for deepwater shrimp in the main Hawaiian islands. The ABC may not exceed the projected overfishing limit (OFL). The Council's ACL process is described in the FEPs, and includes methods by which the ABC may be reduced from the OFL based on scientific uncertainties through a Risk of Overfishing Analysis (P* Analysis[1]). However, since the deepwater shrimp is a Tier 4 stock, a P* Analysis cannot be applied.

[1] P* Analysis is conducted to quantify scientific uncertainties in the data and model used for stock assessment.

2.2.1 ABC Options for the Main Hawaiian Island Deepwater Shrimp

2.2.1.1 Option 1: No Action – Do not specify ABCs

Under this option, the SSC would not specify an ABC for the Hawaii deepwater shrimp stock complex. However, this option would not comply with the Magnuson-Stevens Act or provisions of the FEP of the Hawaii Archipelago which require ABCs to be specified for all stocks and stock complexes in the deepwater shrimp fishery.

2.2.1.2 Option 2: Status Quo – Retain existing ABCs based on the previous specifications

Under this option, the SSC will retain the previously specified ABC for the Hawaii deepwater shrimp stock complex at 250,773 lb. The ABC is 91% of the estimated annual MSY of 275,575 lb/yr. The ABC applies for fishing years 2022–2025. This option continues to utilize the best scientific information available Tagami and Ralston (1988) in absence of any benchmark stock assessment for this stock complex. This is in compliance with the National Standard 2 in using the best scientific information available. This option still prevents overfishing, regardless whether the stock status is unknown, given that the average catch is well below the ACL and the estimated MSY.

2.3 Current Task for the Council

Specifying Annual Catch Limits

The Council's previous recommendation covered to fishing year 2019-2021. The Council needs to specify the ACL for the next three-year ACL starting 2022 to 2025 for deepwater shrimp. No new scientific information will be available in the foreseeable future. The ACL can be set equal or below the SSC recommended ABC. The Council's ACL process is described in the FEPs, and includes methods by which the ACL may be reduced from the ABC based on social, economic, ecological and management uncertainty through a SEEM Analysis.

2.3.1 ACL options for Deepwater Shrimp

2.3.1.1 Option 1: No Action – Do not specify ACL

Under this option, the Council would not specify an ACL for the Hawaii deepwater shrimp stock complex and AMs would not be necessary. However, this option would not comply with the Magnuson-Stevens Act or provisions of the FEP of the Hawaii Archipelago which require ACLs to be specified for all stocks and stock complexes in the deepwater shrimp fishery.

2.3.1.2 Option 2: Status Quo – Retain existing ACL based on the previous specifications

Under this option, the Council will retain the previously specified ACL for the Hawaii deepwater shrimp at 250,773 lb. The ACL is set equal to the SSC specified ABC which is 91% of the estimated MSY of 275,575 lb/yr. The ACL applies for fishing years 2022-2025. This is in

compliance with the National Standard 2 in using the best scientific information available. This option still prevents overfishing, regardless whether the stock status is unknown, given that the average catch is well below the ACL and the estimated MSY. This option will not change the nature and the dynamics of the fishery given that the fishery is currently underutilized There were less than 3 federal permits issued to fish deepwater shrimp in the EEZ in 2020 Given that the fishery participation is low and has been so in the past several years, retaining the existing ABC will not have any adverse impact to the target, non-target stocks, protected species, physical and biological environment, and human communities.

3 Specifications for Precious Coral Fisheries

3.1 Current OFL, ABC, ACL Specification

3.1.1 Stock Status

In 2021, as in recent years the fisheries for deep-sea precious corals in the Main Hawaiian Islands remained inactive. The most recent multiyear specification of OFL, ABC, and ACL for precious coral fisheries was completed in the 174th Council meeting from October 22 to 27, 2018 (85 FR 26622).

Precious corals are not being harvested in any island area except in the MHI where the fishery is limited to black coral harvests in the Auau channel. Fewer than three participants are currently active in the Hawaii black coral fishery; therefore, fishery information is confidential and can only be reported in aggregate years, except for years during which there have been three or more participants. Fishing for other precious corals (pink, bamboo, and gold) is not currently conducted in Hawaii. One company used two one-man submersibles to survey and harvest pink and gold corals at depths between 400 and 500 meters in the MHI during 1999 and 2001; however, they did not continue their operations after that time and the actual harvests cannot be reported here to protect the confidentiality of the proprietary fishery information (WPFMC 2018). In 2011, NMFS issued two Federal permits for fishing in the Hawaii Exploratory Area (X-P-HI); however, no trips were made. In 202020, NMFS issued no permits for precious corals.

3.1.2 Estimation of OFLs, ABC and ACL Calculation

3.1.2.1 Black Coral

There is no estimate of OFL provided for black coral in Hawaii. At the 116th SSC meeting, the SSC considered the MSY estimate provided by Grigg (2004) including the current status of participation in the fishery, and average annual landings for 2000-2010 relative to the existing biennial harvest quota of 5,000 kg (11,000 lbs.). The SSC determined that the black coral fishery in the MHI can be regarded as Tier 4 because MSY is known, but there was little harvest at the time. Therefore, the SSC calculated ABC to be 7,508 lbs and rounded the ABC downward to 7,500 lbs. (Table 1). As explained in the FEP of the Hawaii Archipelago, the application of this control rule would result in a fishing mortality rate of 0.7 F_{MSY}, which would maximize yield while minimizing biomass impacts, and account for scientific uncertainty.

At its 160th meeting held June 25 to 27, 2014 (79 FR 32694), the Council considered the SSC-recommended ABC of 7,500 lbs. however, the Council ultimately recommended maintaining the current harvest quota of 5,000 kg (11,000 lbs.) as the ACL (Table 2). The Council further noted that while the current harvest quota may be taken over a two-year period, ACLs must be specified annually. Therefore, the Council recommended the ACL for the Hawaii black coral fishery in the Auau Channel Bed be set at 5,500 lbs. for fishing years 2015 through 2018. The ACL is thus 2,000 lbs. lower than SSC recommended ABC.

3.1.2.2 Pink and Bamboo Coral

Similarly, there are no estimates of OFLs provided for pink or bamboo corals in Hawaii (note that a moratorium on gold coral harvest is in place throughout the western Pacific. The SSC then determined that precious coral fishery for pink and bamboo corals in the MHI can be regarded as Tier 4 because the MSY/MSY proxy is known, but there is no harvest. Therefore, consistent with the Tier 4 control rule described in the FEP of the Hawaii Archipelago which requires ABC be set equal to 0.91*MSY, the SSC calculated ABC as shown in Table 1.

At its 160th meeting held June 25-27, 2014 (79 FR 32694), the Council considered the SSC's recommended ABC, but further recommended maintaining the current harvest quotas, as they did not see a need to increase catch limits given no activity in the fishery for the past decade (Table 2). The Council further noted that while the current harvest quota of 2,000 kg of pink coral and 500 kg or bamboo coral at Makapuu may be taken over a two year timeframe, ACLs must be specified annually. Therefore, the Council recommended ACL for pink coral and bamboo coral at Makapuu be set at one half of the current two year quota and recommended ACL for these species be set at 1,000 kg and 250 kg, respectively. Table 1 provides the Council's 2017 ACLs for pink and bamboo coral at Established and Conditional Beds in relation to the ABC.

Table 1. Hawaii Precious Coral 2020 ABCs ACLs

Fishery	Management Unit Species	MSY proxy	ABC	ACL	Catch
Precious Corals	Auau channel - black coral	8,250	7,500	5,512	N.D.
	Makapuu bed - pink coral	3,307	3,009	2,205	N.A.
	Makapuu bed - bamboo coral	628	571	551	N.A.
	180 fathom bank - pink coral	734	668	489	N.A.
	180 fathom bank - bamboo coral	139	126	123	N.A.
	Brooks bank - pink coral	1,470	1,338	979	N.A.
	Brooks bank - bamboo coral	280	256	245	N.A.
	Kaena point bed - pink coral	220	201	148	N.A.
	Kaena point bed - bamboo coral	42	37	37	N.A.
	Keahole bed - pink coral	220	201	148	N.A.
	Keahole bed - bamboo coral	42	37	37	N.A.
	Precious coral in MHI exploratory area	N.A.	2,205	2,205	N.A.

3.2 Current Task for the SSC

Setting the Acceptable Biological Catch

The SSC's current task is to specify the ABC for precious corals in the main Hawaiian islands. The ABC may not exceed the projected overfishing limit (OFL) or an OFL proxy. The Council's ACL process is described in the FEPs, and includes methods by which the ABC may be reduced from the OFL based on scientific uncertainties through a Risk of Overfishing Analysis (P* Analysis[2]). However, since the precious coral is a Tier 4 stock, a P* Analysis cannot be applied.

3.2.1 ABC Options for Main Hawaiian Islands Precious Corals

3.2.1.1 Option 1: No Action – Do not specify ABCs

Under this option for black corals, the SSC would not specify an ABC for the black coral fishery in the Auau Channel of the MHI. While the implementing regulations of the FEP of the Hawaii Archipelago already provide for a harvest quota of 5,000 kg (11,000 lb) that may be taken over a two year period, this management system would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes.

Under this option for pink and bamboo corals, the SSC would not specify an ABC for pink or bamboo coral in any Established or Conditional Bed. While the implementing regulations of the FEP of the Hawaii Archipelago already provide for a bank specific harvest quotas as listed in Table 2, this management system would not comply with the Magnuson-Stevens Act or the provisions of the FEPs which require ACLs to be specified for all stocks and stock complexes. Additionally, the moratorium on harvesting gold coral would remain in place through June 30, 2023.

Table 2. Existing harvest quotas for precious corals in established and conditional beds

Name of Bed	Type of Bed	Harvest Quota (kg)	Harvest Timeframe
Auau Channel (MHI)	Established	Black – 5,000	2
Makapuu bed (MHI)	Established	Pink – 2,000	2
		Gold (zero)	
		Bamboo – 500	
180 Fathom Bank (NWHI)	Conditional	Pink – 222	1
		Gold (zero)	
		Bamboo – 56	
Brooks Bank (NWHI)	Conditional	Pink – 444	1
		Gold (zero)	
		Bamboo – 111	
Kaena Point	Conditional	Pink – 67	1
		Gold (zero)	
		Bamboo – 17	
Keahole Point	Conditional	Pink – 67	1
		Gold (zero)	

[2] P* Analysis is conducted to quantify scientific uncertainties in the data and model used for stock assessment.

		Bamboo – 17	
Westpac	Refugia	All (zero)	1
U.S. EEZ around American Samoa, Guam, the CNMI and Hawaii other than Established, Conditional or Refugia beds	Exploratory Area	1,000 per area (all species combined, except black coral	1

3.2.1.2 Option 2: Status Quo – Retain existing ABCs based on the previous specifications

Under this option, the ABC for the black coral fishery in the Auau Channel, MHI, would be retained at 7,500 lb for fishing year 2022-2025. This level of ABC is lower than the estimated MSY proxy therefore prevents overfishing. The current fishery is inactive with only 1 permit holder in 2019. The data is treated confidential. There is no new benchmark assessment or MSY estimate to consider to reevaluate the existing ABC.

Under this option, the ABCs for pink or bamboo coral in Established and Conditional Beds would be retained at levels described in 85 FR 26622 (May 5, 2020) shown in Table 1 for fishing year 2022-2022. This ABC maintains the 91 percent of the estimated MSY therefore prevents overfishing. The pink and bamboo coral fisheries are currently inactive. There is no benchmark assessment or MSY estimate to consider to reevaluate the existing ABC.

3.3 Current Task for the Council

<u>Specifying Annual Catch Limits</u>

The Council's recommendation covers only to fishing year 2021. The Council needs to specify the ACL for the next three-year ACL starting 2022 to 2025 for precious corals. No new scientific information will be available in the foreseeable future. The ACL can be set equal or below the SSC recommended ABC. The Council's ACL process is described in the FEPs, and includes methods by which the ACL may be reduced from the ABC based on social, economic, ecological and management uncertainty through a SEEM Analysis.

3.3.1 ACL options for Precious Corals

3.3.1.1 Option 1: No Action – Do not specify ACL

Under this option, the Council would not specify an ACL for the black, pink or bamboo corals in any Established or Conditional Bed and AMs would not be necessary. While the implementing regulations of the FEP of the Hawaii Archipelago already provide for a bank specific harvest quotas as listed in Table 2 and termed as ACLs in Table 1, this management system would not comply with the Magnuson- Stevens Act or the provisions of the FEPs which require ACLs to be

specified for all stocks and stock complexes. Additionally, the moratorium on harvesting gold coral would remain in place through June 30, 2023.

3.3.1.2 Option 2: Status Quo – Retain existing ACL based on the previous specifications

Under this option, the ACLs for black, pink or bamboo coral in Established and Conditional Beds would be retained at the levels described 85 FR 26622 (May 5, 2020) shown in Table 1 for fishing 2022-2025. This level of ACL is equivalent to the current harvest quotas. As previously noted, the current harvest quota for pink of 2,000 kg and the current harvest quota for bamboo coral of 500 kg at the Makapuu Bed may be taken over a two year timeframe. Therefore, to comply with the ACL requirement, the Council recommends the ACLs for pink coral and bamboo coral at the Makapuu Bed be set at one half of the current two year quota and recommend the ACL for these species be set at 1,000 kg/yr and 250 kg/yr, respectively. Like Option 1 the moratorium on harvesting gold coral would remain in place through June 30, 2023 and would serve as the functional equivalent of an ACL of zero. Each of the proposed ACLs is lower than the ABCs as shown in Table 1. The black, pink and bamboo coral fisheries are currently inactive. There was one permit issued by NMFS in 2019 and the data will be treated as confidential.

4 References

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