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**Specifying Annual Catch Limits for the Bottomfish Management Unit Species
in the Commonwealth of the Northern Mariana Islands**

Western Pacific Fishery Management Council
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1 Introduction

Fisheries for bottomfish management unit species (BMUS) 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). In each archipelago, bottomfish fisheries harvest an assemblage, or complex of species that include emperors, snappers, groupers, and jacks. 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 BMUS. ACLs are recommended by the Council 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 Scientific and Statistical Committee (SSC).

1.1 Best Scientific Information Available

In August 2019, NMFS Pacific Islands Fisheries Science Center (PIFSC) completed a benchmark stock assessment for bottomfish in Guam, American Samoa and the CNMI (Langseth et al. 2019). The assessments used a state-space Bayesian surplus production model within the modeling framework Just Another Bayesian Biomass Assessment (JABBA). Estimates of harvest rate (H), annual biomass (B), the harvest rate associated with overfishing as determined by the harvest control rule (HCR), maximum sustainable yield (MSY), and the biomass at maximum sustainable yield (BMSY) allowed for determination of stock status relative to reference points determining overfishing ($H/HCR > 1$) and overfished ($B < 0.7 \times BMSY$) status. Stock projections were conducted for 2020–2025 for a range of hypothetical 6-year catches, and the corresponding risk of overfishing was calculated.

The 2019 benchmark assessment was reviewed by the WPSAR panel on April 15-18, 2020. The panel found the assessment update adequate for management use (Martell, Powers, and Nielson 2019). The SSC at its 134th meeting in October 15, 2019 received the WPSAR review reports and the peer-reviewed benchmark stock assessment. The SSC noted the concerns regarding the application of the assessment to the single BMUS complex and the quality of the data used in the assessment. The SSC also noted the improvements in the benchmark assessment compared to the 2015 assessment update.

2 Summary of Bottomfish Fishery Information

2.1 CNMI Bottomfish MUS

2.1.1 Estimation of OFL

According to the PIFSC 2019 bottomfish stock assessment update (Langseth et al. 2019), the long-term MSY for CNMI bottomfish is estimated to be 93,600 lb (95%CI= 48,800-205,300 lb) which is lower than the previous MSY estimate of $173,100 \pm 32,190$ lb reported in the assessment by Yau et al. (2015). Stock projection results, which assumed that a six-year bottomfish catch limit would be harvested in its entirety in the previous years, indicated that an ACL set at 95,000 lb would result in a 50 percent probability of overfishing in 2024 and 2025 (Table 1) the maximum risk allowable under Federal law (74 FR 3178, January 9, 2011). Therefore, 95,000 lb is considered to be the OFL proxy for the two year period. As a reference, estimated average annual total catch during the period 2019-2021 was 43,792 lb.

Table 1: CNMI BMUS probabilities of overfishing

Probability of overfishing ($H/H_{CR}>1$) in terminal year	2020	2021	2022	2023	2024	2025	Probability of overfishing ($H/H_{CR}>1$) in terminal year	2020	2021	2022	2023	2024	2025
0.01	2	3	4	5	6	7	0.26	68	68	68	68	68	66
0.02	6	7	9	11	13	14	0.27	70	69	70	68	68	68
0.03	9	11	14	16	17	21	0.28	72	71	71	70	70	69
0.04	12	15	18	21	22	24	0.29	74	72	72	72	71	71
0.05	16	18	23	24	26	28	0.30	75	74	74	72	72	71
0.06	18	22	25	28	29	31	0.31	77	76	74	74	73	72
0.07	22	25	29	31	33	34	0.32	79	78	77	75	74	74
0.08	25	29	32	35	35	36	0.33	81	79	78	77	75	75
0.09	28	33	34	37	38	38	0.34	82	81	79	78	77	75
0.10	32	36	38	39	40	42	0.35	84	82	80	80	78	77
0.11	35	38	40	41	43	43	0.36	85	83	82	80	80	78
0.12	38	41	41	44	45	45	0.37	87	85	83	82	81	80
0.13	40	44	45	46	48	49	0.38	89	87	85	83	82	81
0.14	43	46	48	49	49	49	0.39	90	88	86	84	83	82
0.15	46	49	49	50	51	51	0.40	92	89	87	86	84	83
0.16	48	50	51	51	52	53	0.41	95	90	88	86	86	84
0.17	50	52	53	53	54	54	0.42	94	91	90	88	86	85
0.18	53	54	55	56	56	56	0.43	97	95	90	89	87	86
0.19	54	56	57	57	57	57	0.44	98	94	93	90	89	88
0.20	57	57	58	59	59	59	0.45	101	96	93	92	90	89
0.21	58	60	60	61	61	60	0.46	102	97	94	93	90	90
0.22	61	62	62	61	61	61	0.47	104	99	96	94	93	90
0.23	63	63	63	63	63	62	0.48	105	101	97	94	93	93
0.24	64	64	65	64	64	63	0.49	108	102	100	96	94	93
0.25	66	66	67	66	65	66	0.50	109	104	101	98	96	95

Source: Langseth et al. (2019).

2.1.2 Stock Status

In 2017, the most recent year for which stock status information is available, $H_{2017}/H_{CR} = 0.79$ while $B_{2017}/B_{MSY} = 1.08$ (Langseth et al 2019, Table 2). The production model results indicated that the CNMI bottomfish complex in 2017 was not overfished and did not experience overfishing (**Error! Reference source not found.**). However, the data quality and the lack of contrast in the CPUE resulted in a large uncertainty in the stock status projections. In 2021, the most recent year for which annual estimated BMUS catch data are available; there was an estimated total catch of 74,855 lb (Table 3).

Table 2: Stock assessment parameters for CNMI BMUS complex in 2017

Param	Value	Notes	Status
MSY	93.6 (48.8-205.3)	Expressed in 1,000 lb (95%CI)	
H_{2017}	0.12	Expressed in percentage	
H_{MSY}	0.261 ± 0.063	Expressed in percentage (95%CI)	
H/H_{CR}	0.79		No overfishing
B_{2017}	569.2	Expressed in 1,000 lb	
B_{MSY}	570.6 (107.1-636.8)	Expressed in 1,000 lb (95%CI)	
B/B_{MSY}	1.08		Not overfished

Source: Langseth et al. (2019).

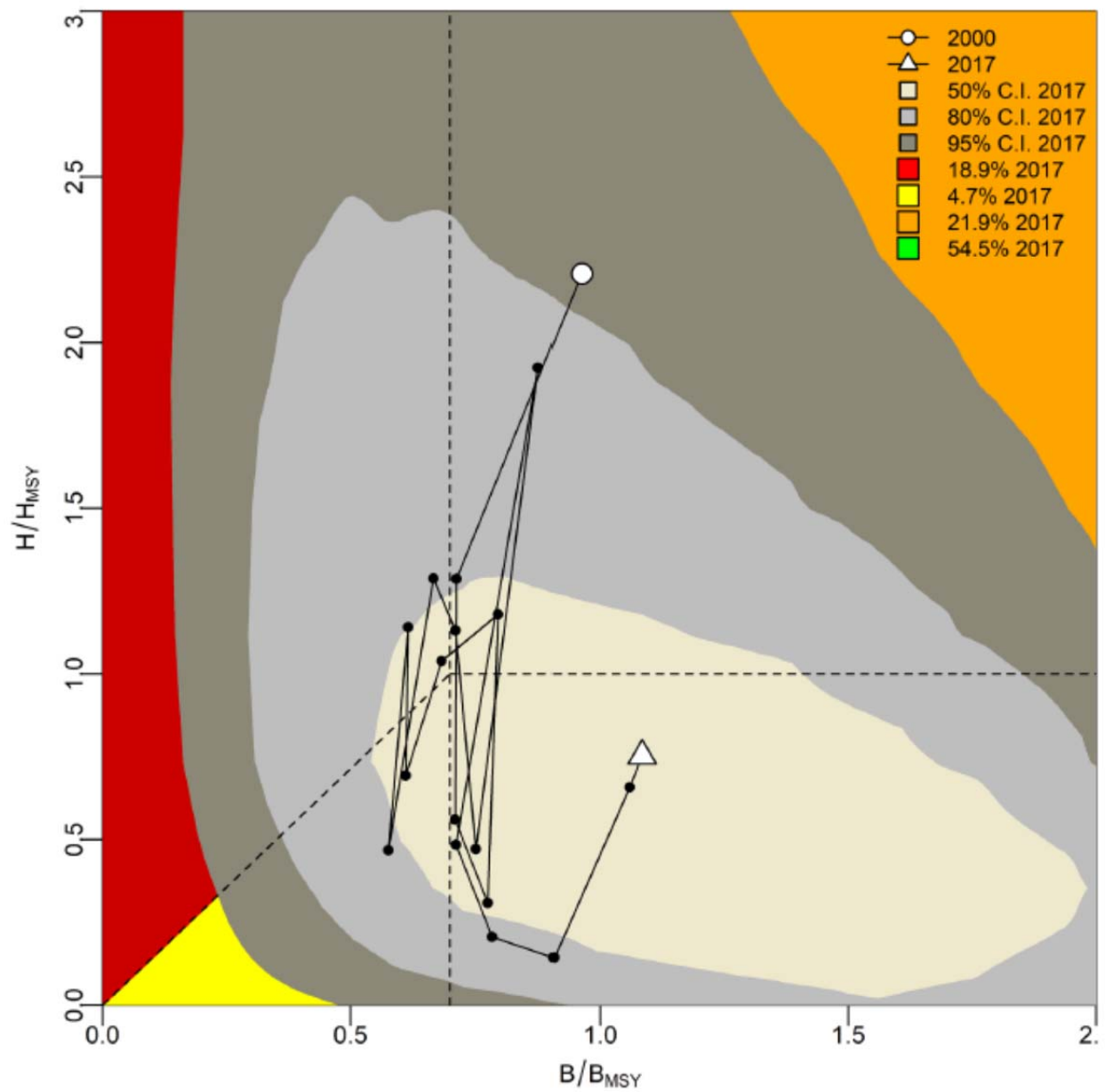


Figure 1: Kobe plot of relative biomass and relative exploitation rate from the best fitting production model for CNMI from 1983 to 2013

Source: Langseth et al. (2019).

Table 3: Annual estimated BMUS catch (lb) in CNMI from 2009 to 2022

Year	Estimated Total Catch
2009	65,290
2010	56,009
2011	25,821
2012	137,579
2013	20,390
2014	7,906
2015	10,601
2016	54,371
2017	48,066
2018	652
2019	21,014
2020	45,583
2021	74,855
2022	47,564
Avg. Catch 2020-2022	56,000

Source: WPRFMC (2022).

2.1.3 Current Annual Catch Limits

The SSC set the ABC at 84,000 lbs. The Council set the ACL equal to the ABC and set an ACT at 78,000 lbs utilizing the reduction of 5% risk of overfishing from the SEEM analysis. On May 7, 2021, NMFS implemented an ACL of 84,000 lb for CNMI BMUS from 2020 to 2023 (86 FR 24511), and an ACT of 78,000 lb was also implemented (Table 4). If the recent three-year average catch exceeds the ACT but remains below the ACL, then an overage adjustment would not be applied.

Table 4: CNMI 2021 ACL table with three year average catch in lbs.

Fishery	MUS	OFL	ABC	ACL	ACT	3 yr avg Catch
CNMI Bottomfish	Bottomfish multi-species complex	95,000	84,000	84,000	78,000	56,000

2.2 Current Task for the SSC

Specifying the Acceptable Biological Catch

The SSC's current task is to specify the ABC for bottomfish MUS in the CNMI for the 2024 to 2025 fishing years. The ABC may not exceed the projected overfishing limit based on the 2019 stock assessment. the Council's ACL process is described in the FEPs, and included methods by which the ABC may be reduced from the OFL based on scientific uncertainties through a Risk of Overfishing Analyst (P* Analysis).

The SSC accepted the 2019 benchmark assessment as the best scientific information available for setting harvest limits for fishing year 2020 to 2023. The SSC also recommended that the Council direct staff to convene the P* and SEEM working group to quantify the uncertainties to set the ABC and specify the ACLs. Since the CNMI bottomfish fishery is a Tier 3 stock, the SSC applied the P* analysis to set the ABC. The Risk of Overfishing table (Table 1) was used by the SSC to set the ABC. The SSC set the ABC at 39% which includes the results of the Marianas P* analysis (WPRFMC 2020a and 2020b) which resulted in a CNMI P* reduction of 11 percent reduction accounting for scientific uncertainty (WPRFMC 2019a). This resulted in an ABC of 84,000 lbs for fishing year 2020-2023.

A new stock assessment is expected in 2025 that will provide new information to set future ACLs for the CNMI bottomfish fishery. However, the only information available for the current fishery is the 2019 benchmark assessment that was best scientific information available at the time. The SSC will need to determine if the 2019 benchmark assessment is still the best scientific information available and provide an ABC for the fishery to the Council in order to set ACLs. The SSC may also determine whether or not the existing P* analysis is sufficient for the scientific uncertainty.

2.2.1 *ABC Options for CNMI Bottomfish*

2.2.1.1 Option 1: No Action – Do not set the ABCs

Under Option 1, the SSC would not set an ABC level for CNMI bottomfish for fishing years 2024–2025. This option would not comply with the Magnuson-Stevens Act (50 CFR 665.4) or the provisions of the Mariana Archipelago FEP, which require the Council to specify an ACL for all managed stocks and stock complexes in a fishery. In order to set the ACL, an ABC is required according to the control rules. Option 1 serves as the baseline for environmental effects analyses involving other options.

2.2.1.2 Option 2: Set ABC based on the 2019 benchmark stock assessment and the current catch level of 84,000 lbs

The Risk of Overfishing tables (Table 1 and Table 4) were used by the SSC to set the ABC by setting the ABC at a level reduced from 50% by the CNMI P* analysis. The CNMI P* resulted in an 11% reduction accounting for scientific uncertainty at that time (WPRFMC 2019a) for an ABC at a risk of overfishing at 39% (corresponding to a catch level of 84,000 lbs). Under Option 2, the SSC would set the ABC based on the catch level of 84,000 lbs which, according to Table 1, corresponds with a 41% risk of overfishing.

Under Option 2, the ABC for CNMI BMUS would be 84,000 lb for the 2024-2025 fishing year and the Council would use this number with the previous SEEM analysis to determine the final ACL (and ACT if needed). The fishery has consistently landed below the ACL except for that one year when the fishery landed an order of magnitude higher compared to all other years. Fishery operations have remained consistent since ACLs were first implemented. The average annual catch from 2020 to 2022 was 56,000 lbs, which is 72 percent of the current ACT of 78,000 lb. The ACT could be similar for the next fishing years. Given the current state of

CNMI's bottomfish fleet and historical catch, it is unlikely that total catch in 2024-2025 would approach the ABC under this option.

2.2.1.3 Option 3: Set ABC based on the 2019 benchmark stock assessment at P*=39 percent equivalent to 82,000 lbs

Under this option, the SSC would again set the ABC at 39%, which includes a CNMI P* reduction of 11 percent reduction accounting for scientific uncertainty (WPRFMC 2019a, 2020a and 2020b). The annual catch level at 39% risk of overfishing, according to Table 4 for terminal year 2025, is 82,000 lbs.

Under Option 3, the ABC for CNMI BMUS of 82,000 lb for the 2024-2025 fishing year and the Council would use this number with the previous SEEM analysis to determine the final ACL (and ACT if needed). The fishery has consistently landed below the ACL except for that one year when the fishery landed an order of magnitude higher compared to all other years. Fishery operations have remained consistent since ACLs were first implemented. The average annual catch from 2020 to 2022 was 56,000 lbs, which is 72 percent of the current ACT of 78,000 lb. If this ABC is used for the next fishing years, the ACT could be lower than the current ACT but still above the three-year average. Given the current state of CNMI's bottomfish fleet, it is unlikely that total catch in 2024-2025 would approach the ABC under this option.

2.3 Current Task for the Council

Specifying the Annual Catch Limits

The Council task is to specify the ACL from the SSC recommended ABC for the bottomfish fishery in the CNMI for fishing year 2024-2025. The Council's ACL specification process allows for a maximum of four year specification. The ACL should not exceed the SSC's 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 the management uncertainties through a Social, Ecological, Economic, and Management Uncertainty Analysis (SEEM Analysis). The CNMI SEEM working group met on January 31. The working groups scored the four SEEM dimensions based on the standardized framework developed by the Social Science Planning Committee (Hospital et al. 2019): 1) social; 2) economic; 3) ecological; and 4) management uncertainties. The management uncertainty was further divided into two sub-dimensions: monitoring and management. The CNMI P* working group concluded that a 11% reduction from the ABC is required to account for the management uncertainties.

2.4 ACL Alternatives for Bottomfish MUS

2.4.1 Option 1: No Action – Do not specify ACLs

Under Option 1, the Council would not specify an ACL for the bottomfish fishery in the CNMI for the 2024-2025 fishing years. However, this alternative would not comply with the

Magnuson-Stevens Act or the provisions of the Marianas FEP, which require NMFS to specify an ACL for all stocks and stock complexes.

Expected Fishery Outcome

Under this option, not specifying an ACL or AM is not expected to result in large adverse effects on the conduct of the fishery, including gear types used, areas fished, level of catch or effort, target and non-target stocks, or protected species for CNMI. This is because, based upon the best available commercial and scientific information, the Territory bottomfish fishery historically harvests less than the stock complex's maximum sustainable yield, and is not constrained by the ACLs. As shown in Table 3, the estimated catches of Territory bottomfish have consistently remained below the estimated OFL of 95,000 lb for CNMI. The catches were also below the long-term MSY of 93,600, except for 2012 when the estimated catch exceeded the MSY. The catch in 2012 is roughly four times the average catch.

In the 2012 fishing year, the estimated CNMI catch was 137,495 lb of BMUS. This is the highest level of catch since NMFS implemented a catch limit system in fishing year 2012 and in the past 10 years. The estimated commercial component of that catch did not significantly increase. In recent years, the fishery has not reached the ACL. In fishing year 2024-2025, total reported catch is expected to be similar to catch in recent years, and is not expected to result in overfishing. Therefore, the expected fishery outcome under Option 1 would not be expected to have major adverse effects on the conduct of the fishery in CNMI.

The best scientific information available produced a more conservative estimate of MSY and OFL projections. Under this option, not specifying an ACL or AM may result in adverse effects on the conduct of the fishery particularly on the target stocks, area fished, and level of catch and effort.

In the CNMI, the fishing year begins January 1 and ends on December 31. In accordance with 50 CFR 665.4, when NMFS projects that catches will reach an ACL for any stock or stock complex, the agency must restrict fishing for that stock or stock complex in the applicable U.S. EEZ to prevent catches from exceeding the ACL. The restriction may include, but is not limited to, closing the fishery, closing specific areas, or restricting effort (76 FR 37286, June 27, 2011). However, an in-season restriction cannot be implemented for any territorial bottomfish fishery because catch statistics only become available about six months after local management agencies collect the data. For this reason, the Council may recommend a post-season accounting of the annual catch for a stock complex relative to its ACL immediately after the end of the fishing year, or as soon as possible, given the limitations in the data collection and processing methods. Additionally, if landings of any stock complex exceed the specified ACL in a fishing year, the AM requires the Council to take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. This may include a recommendation that NMFS implement a downward adjustment to the ACL in the subsequent fishing year, or other measures, as appropriate. As an additional performance measure specified in each FEP, if catches exceed any ACL more than once in a four-year period, the Council must re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness. Future changes to an ACL would be subject to separate environmental review at such time as changes are proposed, and are not part of the current proposed action.

2.4.2 Option 2: Status quo - Specify the ACL based on the 2023 package

Under this option, the CNMI ACL will be specified at 41 percent risk of overfishing corresponding to an annual catch level of 84,000 lb using 2025 as the terminal year.

The current ACL (2020-2023) for CNMI bottomfish is based on the the best scientific information available (Langseth et al 2019). The Risk of Overfishing tables (Table 1 and 4) were used by the SSC to set the ABC by setting the ABC at a level reduced from 50% by the CNMI P* analysis. The CNMI P* resulted in an 11% reduction accounting for scientific uncertainty at that time (WPRFMC 2019a) for an ABC at a risk of overfishing at 39% (corresponding to a catch level of 84,000 lbs). That Council accounted for uncertainty in the management and monitoring by utilizing the SEEM analysis (WPRFMC2020c and 2020d) which is associated with a five percent reduction to set an ACT of 78,000 lbs (corresponding with a risk of overfishing of 34%). This option increases the risk of overfishing 39% to 41% risk of overfishing to maintain the status quo catch level of 84,000 lb ACL with an ACT of 78,000 lbs (Table 5). The increase in risk is also a decrease in uncertainty due to the fishery not exceeding the ACL in the past three years.

Expected Fishery Outcome

Under Option 2, fishing for CNMI BMUS would be subject to an ACL of 84,000 lb for the 2024-2025 fishing year. The fishery has consistently landed below the ACL except for that one year when the fishery landed an order of magnitude higher compared to all other years. Fishery operations have remained consistent since ACLs were first implemented. The average annual catch from 2019 to 2021 was 47,151 lbs, which is only 60 percent of the ACT of 78,000 lb. Given the current state of CNMI's bottomfish fleet, it is unlikely that total catch in 2024-2025 would approach the ACL under this option. Since there is no data that would allow NMFS to implement an in-season closure to prevent the ACL from being exceeded, the AM under this alternative would be the same as those described under Option 1. Therefore, the impacts to fishermen would be similar to those described in Option 1.

2.4.3 Option 3: Specify the ACL based on the SSC recommended ABC and results from the SEEM analysis

Under this option, the Council will be utilizing the best scientific information available (Langseth et al 2019) in setting the ACL for fishing year 2024-2025. The Risk of Overfishing table (Table 1) was used by the SSC to set the ABC. The SSC set the ABC at 39% which includes the results of the Marianas P* analysis (WPRFMC 2020a and 2020b) which resulted in a CNMI P* reduction of 11 percent reduction accounting for scientific uncertainty (WPRFMC 2019a). Option 3 would also include a further reduction by utilizing the Marianas SEEM analysis (WPRFMC 2020c and 2020d) which resulted in a five percent reduction accounting for the uncertainties from monitoring and management to set the risk of overfishing at 39%. The annual catch level at 39% risk of overfishing, according to Table 4 for terminal year 2025, is 82,000 lbs.

The previous ACL set for 2020-2023 was based on this 39% risk of overfishing but corresponded to a higher catch level. This option assumes the same level of scientific,

monitoring, and management uncertainty is still applicable even with the fishery not having exceeded the ACL at any point in 2020-2023.

Expected Fishery Outcome

Under Option 3, fishing for CNMI BMUS would be subject to an ACL of 82,000 lb for the 2024-2025 fishing year. The fishery has consistently landed below the ACL except for that one year when the fishery landed an order of magnitude higher compared to all other years. Fishery operations have remained consistent since ACLs were first implemented. The average annual catch from 2019 to 2021 was 47,151 lbs, which is only 63 percent of the ACT of 75,000 lb. Given the current state of CNMI's bottomfish fleet, it is unlikely that total catch in 2024-2025 would approach the ACL under this option. Since there is no data that would allow NMFS to implement an in-season closure to prevent the ACL from being exceeded, the AM under this alternative would be the same as those described under Option 1. Therefore, the impacts to fishermen would be similar to those described in Option 1.

Table 5: Risk of overfishing, ACL, and ACT options under the proposed action

Option	Risk of Overfishing	ACL	ACT
1-No Action	NA	NA	NA
2-Status Quo-Existing Catch Level	41%	84,000 lbs	78,000 lbs
3-Status Quo-Existing Risk of Overfishing	39%	82,000 lbs	75,000 lbs

3 Summary of New Information for the Impact Analysis

The table below summarizes the new information (if any) that can be used to evaluate the impacts of the options to the target stocks and the environment.

New info on physical resources	There is no new information available. The action will not likely have an adverse impact to the physical environment.
New info on biological resources	
<ul style="list-style-type: none"> Target 	For CNMI, the stock status for the target BMUS is sustainable according to Langseth et al. 2019. This action will likely have no adverse effect on the target stock.
<ul style="list-style-type: none"> Non-target 	The bottomfish fishery harvests both deep snapper complex and the shallow water reef fish species complex. The action will not likely change the conduct of the fishery. It is a hook and line fishery and the species composition is anticipated to remain similar to previous years.
<ul style="list-style-type: none"> Bycatch 	CNMI bottomfish fishery had 0% bycatch in 2018. Therefore, the action is not likely to have an adverse impact on bycatch species.

<ul style="list-style-type: none"> Protected species 	<p>On January 22, 2018, NMFS issued a final rule to list the giant manta ray as a threatened species under the ESA (83 FR 2916). On January 30, 2018, NMFS issued a final rule to list the oceanic whitetip shark as threatened under the ESA (83 FR 4153). In response to these listings, NMFS reinitiated consultation under ESA on June 5, 2019, as required by 50 CFR 402.16. Based on the information in the biological evaluation prepared to support this consultation (NMFS 2019a), NMFS determined that the bottomfish fishery in Guam (1) may affect, and is likely to adversely affect, the oceanic whitetip shark; and (2) may affect, but is not likely to adversely affect, the giant manta ray. NMFS reinitiated consultation to determine whether the bottomfish fishery in Guam is likely to jeopardize the continued existence of the oceanic whitetip shark, and to seek concurrence that the fishery is not likely to adversely affect the giant manta ray. On June 6, 2019, NMFS determined that during the period of consultation, the continued operation of the bottomfish fishery in Guam is not likely to jeopardize the oceanic whitetip shark or the giant manta ray; would not violate ESA section 7(a)(2); or result in an irreversible or irretrievable commitment of resources precluding implementation of any reasonable and prudent alternatives (2019b). The 2019 Biological Opinion found no adverse impacts on the oceanic whitetip shark and giant manta ray from the CNMI bottomfish fishery.</p>
<ul style="list-style-type: none"> Biodiversity and eco-function 	<p>The action is not likely to have an adverse effect on biodiversity and ecosystem function since the fishery has been landing well below the ACL since 2012 until the new assessment generated a conservative catch projection estimate. The bycatch rates are very low, and fishing methods do not impact the habitat.</p>
New info on socio-economic setting	<p>No new socio-economic information aside from the updated fishing participation data from the Territory Annual SAFE Report</p>
New info on management setting	
<ul style="list-style-type: none"> Marine Protected Areas 	<p>No new information and the actions are not likely to adversely affect the management of MPAs. The fishery does not occur inside protected areas.</p>
<ul style="list-style-type: none"> EFH/HAPC 	<p>No change in EFH/HAPC for the Territory bottomfish in the Marianas</p>

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