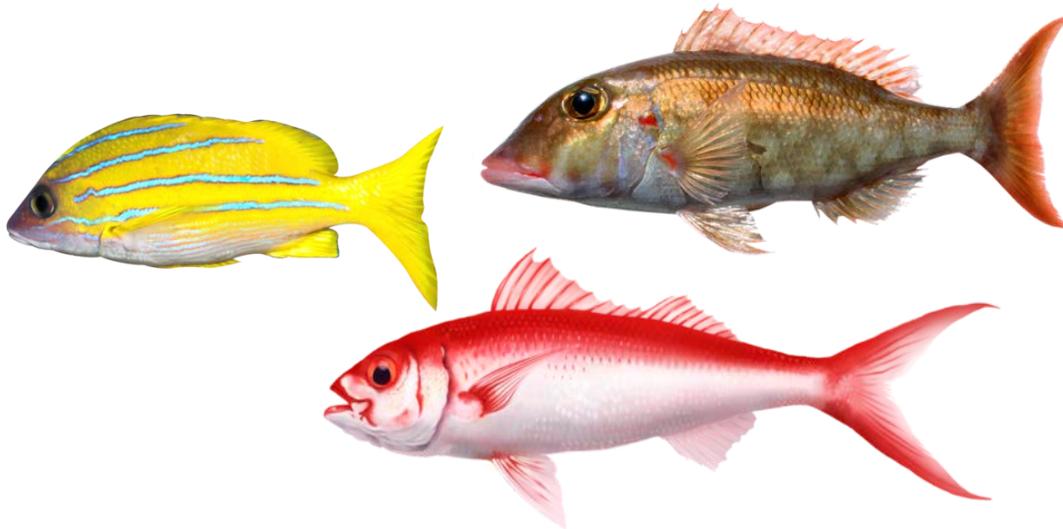


Amendment 6 Fishery Ecosystem Plan for the Mariana Archipelago

Rebuilding Plan for Guam Bottomfish
including a Draft Environmental Assessment and Regulatory Impact Review

RIN 0648-BK66

November 5, 2021



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Abstract

The National Marine Fisheries Service (NMFS) proposes to implement a rebuilding plan for the bottomfish multi-species stock complex in Guam with annual catch limits (ACL) and accountability measures (AM) for the bottomfish fishery. The Western Pacific Fishery Management Council (Council) developed this rebuilding plan in coordination with NMFS, the Guam Division of Aquatic and Wildlife Resources (DAWR), fishermen, and other interested and affected parties. The Council initiated development of the rebuilding plan due to new information about the Guam bottomfish fishery from the 2019 benchmark stock assessment (Langseth et al. 2019) that found the bottomfish stock complex is overfished.

When NMFS determines that a fishery is overfished or experiencing overfishing, Section 304(e) of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) and implementing regulations at 50 CFR 600.310(j) require the Council to develop a long-term plan to end overfishing and rebuild the stock. This rebuilding plan must be implemented within two years of the notification that a fishery is in an overfished condition or experiencing overfishing. Also, the rebuilding plan must be developed by the Council and should be submitted to NMFS within 15 months of the notification of overfishing or an overfished designation to allow sufficient time for NMFS to implement the plan. The rebuilding plan must specify a time for rebuilding that is as short as possible, considering the status of the biology of the affected stocks, the needs of the fishing communities, and the interaction of the stock with the marine ecosystem, and generally may not exceed 10 years.

On February 10, 2020, NMFS notified the Council of its determination that the Guam bottomfish stock complex, which is managed under the Mariana Archipelago Fishery Ecosystem Plan (FEP), had a change in status based on the results of the most recent benchmark stock assessment for the fishery (Langseth et al. 2019). The Council began the process of developing a rebuilding plan immediately upon notification of the change in the stock status. The stock assessment was produced by NMFS Pacific Islands Fisheries Science Center (PIFSC) used data through 2017 and showed that the Guam multi-species bottomfish complex, which includes 13 species of bottomfish management unit species (BMUS), is overfished.

The majority of bottomfish habitat is in territorial waters (73.6 percent), while a smaller amount of bottomfish habitat in Federal waters is located around offshore banks both to the northeast and southwest of Guam (26.4 percent). Per 16 U.S.C. 1851(a)(3), the Council and NMFS are required to manage stocks throughout their range. The Council and NMFS only have the authority to implement fishery management regulations in Federal waters, and the Government of Guam has discretion to implement management complementary to Federal action or other management actions in its territorial waters.

The most recent three-year average catch (from both Federal and territorial waters) of bottomfish in Guam from 2018 to 2020 was 27,306 lb, and the fishery landed 18,933 lb in 2020. The fishing year for bottomfish in Guam begins January 1 and ends December 31. The benchmark stock assessment (Langseth et al. 2019) considered catch from both territorial and Federal waters in its finding that the Guam bottomfish stock complex is overfished. Assuming that the distribution of bottomfish habitat is consistent with the amount of bottomfish catch around the territory, catch in Federal waters likely accounts for less than 27 percent of the total catch.

NMFS and the Council manage bottomfish fishing in Federal waters around Guam in accordance with the Mariana Archipelago Fishery Ecosystem Plan (FEP). NMFS proposes to implement a rebuilding plan for the bottomfish multi-species stock complex in Guam with an annual catch limit (ACL), in-season accountability measure (AM), and performance standard for the bottomfish fishery. As an additional AM, if the ACL is exceeded (consistent with 50 CFR 600.310(g)(7)), then NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. NMFS and the Council would review and amend the rebuilding plan as necessary using the best scientific information available to allow the reopening of the fishery in Federal waters.

At its 186th meeting on June 22-24, 2021, the Council took final action to recommend a rebuilding plan with an ACL of 31,000 lb. NMFS would count bottomfish catches from both territorial waters and Federal waters around Guam towards the ACL. The rebuilding plan would be in effect until the Guam bottomfish stock complex is rebuilt to the stock complex's maximum sustainable yield (B_{MSY}). NMFS expects that an annual catch of 31,000 lb of bottomfish would allow the bottomfish stock complex to have a greater than 50 percent change to rebuild biomass to B_{MSY} in nine years. As an in-season AM, NMFS would evaluate available catch information during the fishing year and close the fishery in Federal waters for the remainder of the year when the fishery is projected to attain the ACL, or immediately if the catch is determined to have already exceeded the ACL. As a higher performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Under the Magnuson-Stevens Act, NMFS and the Council would review the rebuilding plan every two years and amend it as necessary using the best scientific information available.

Since the Council and NMFS only have the authority to manage fishing in Federal waters, restricting harvest so that it does not exceed any ACL would require complementary management by the territory. If Federal waters are closed and the territory chooses not to implement complementary management with the Federal action, harvest would still be allowed in territorial waters. Thus, whether or not rebuilding can be achieved in the proposed timeline depends on the Guam Government implementing management in its waters to complement this Federal action due to the displacement of fishing effort from Federal waters to territorial waters. NMFS does not currently have information to determine the level of displacement that may occur.

The Magnuson-Stevens Act requires that NMFS implement the rebuilding plan within two years of the notification that a fishery is in an overfished condition or experiencing overfishing. NMFS adopted the findings of the assessment and notified the Council of the change in stock status on February 10, 2020 (85 FR 26940, May 6, 2020). The Council should submit the rebuilding plan to NMFS within 15 months of the notification of overfishing or an overfished determination to allow sufficient time for NMFS to implement the plan. The rebuilding plan must specify a time for rebuilding that is as short as possible, accounting for the status of the biology of the affected stock(s), the needs of the fishing communities, and the interaction of the stock with the marine ecosystem, and generally may not exceed 10 years.

NMFS and the Council prepared this draft EA to evaluate the potential environmental effects of alternative management measures. The draft EA includes a description of the information and methods used by NMFS and the Council to develop the proposed management measures, describes the purpose and need for action, the alternatives considered and those rejected from detailed consideration, and the expected fishery outcome of each alternative. It includes an analysis of potential environmental effects of each alternative as compared against the no-action baseline in which the does not implement a rebuilding plan.

The analysis in the draft EA indicates that most of the proposed alternatives may result in significant impacts to the Guam fishing community if complementary management with this Federal action were to be implemented by the Guam Government. This is because then bottomfish fishermen would need to stop harvesting bottomfish in both Federal and territorial waters when the catch limit is reached. However, the analysis also indicates that the proposed alternatives would not result in major beneficial or adverse effects on target, non-target, or bycatch species, protected species, marine habitats, or fishing communities relative to the environmental baseline if complementary management is not implemented.

Whether rebuilding can be achieved in the timelines proposed under the various alternatives depends on whether Guam implements management in its waters to complement Federal management. If it does, rebuilding under the action alternatives is expected to be achieved within the proposed timeframe, within 10 years as required by National Standard 1 of the Magnuson-Stevens Act. If the territory does not implement complementary management, then the timelines for which rebuilding is likely to be achieved may be slightly delayed but still within statutory requirements. The likelihood of short-term economic and social impacts to local fishing communities is also dependent on the territory's decision to implement complementary management.

How to Comment

NMFS is seeking public comment on proposed Amendment 6, including a draft EA and Regulatory Impact Review. You may submit comments by either of the following methods:

- **Electronic Submission:** Submit all electronic comments via the Federal e-Rulemaking Portal. Go to www.regulations.gov and enter NOAA-NMFS-2021-0104 in the Search box, click the "Comment" icon, complete the required fields, and enter or attach your comments.
- **Mail:** Send written comments to Michael D. Tosatto, Regional Administrator, NMFS Pacific Islands Region (PIR), 1845 Wasp Blvd. Bldg. 176, Honolulu, HI 96818.

If you need assistance with this document, please contact NMFS at 808-725-5000.

Table of Contents

Abstract.....	2
Table of Contents	5
List of Acronyms and Abbreviations	9
1 Introduction.....	11
1.1 Background Information.....	11
1.2 Proposed Action.....	13
1.3 Purpose and Need.....	14
1.4 Action Area	14
1.5 Benchmark Stock Assessment and Status of the Stock	14
1.6 Magnuson-Stevens Act Criteria for Rebuilding Overfished Fisheries.....	19
1.7 Overview of ACL and AM Development Process	20
1.8 Public Review and Involvement.....	21
1.9 NEPA Compliance.....	23
1.10 How to Comment.....	23
1.11 List of Preparers and Reviewers.....	24
2 Description of Alternatives and Overview of the Rebuilding Plan	25
2.1 Development of the Alternatives	25
2.2 Features Common Among Alternatives.....	26
2.2.1 Features common to Alternative 2 - 4.....	27
2.2.2 Features Common to Alternatives 2 through 5	28
2.3 Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan.....	29
2.3.1 Expected Fishery Outcome (Alt. 1)	29
2.3.2 Estimated Conservation and Management Benefit (Alt. 1).....	30
2.3.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 1).....	31
2.4 Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard	31
2.4.1 Expected Fishery Outcome (Alt. 2)	33
2.4.2 Estimated Conservation and Management Benefit (Alt. 2).....	36
2.4.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 2).....	36
2.5 Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard	36
2.5.1 Expected Fishery Outcome (Alt. 3)	37
2.5.2 Estimated Conservation and Management Benefit (Alt. 3).....	38
2.5.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 3).....	38

2.6	Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)	39
2.6.1	Expected Fishery Outcome (Alt. 4)	40
2.6.2	Estimated Conservation and Management Benefit (Alt. 4)	41
2.6.3	Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 4)	41
2.7	Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam	42
2.7.1	Expected Fishery Outcome (Alt. 5)	42
2.7.2	Estimated Conservation and Management Benefit (Alt. 5)	43
2.7.3	Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 5)	43
2.8	Alternatives Considered but Not Analyzed	43
2.8.1	No Management Action	43
2.8.2	Implement an Annual Catch Limit with Territorial and Federal Components	44
2.8.3	Implement Federal Permitting and Reporting Alongside Bag Limits	44
2.8.4	Implement an Annual Catch Target (ACT) in Addition to an ACL	45
2.8.5	Implement a Post-Season Accountability Measure	45
2.8.6	Implement an Annual Catch Limit of 31,500 lb with an In-Season Accountability Measure and Higher Performance Standard	46
2.9	Comparison of Features of the Alternatives	46
3	Affected Environment and Potential Effects of the Alternatives	50
3.1	Overview of Guam	50
3.2	Overview of Bottomfish Biology and Distribution	50
3.3	Overview of the Bottomfish Fishery	51
3.4	Overview of Fishery Management and Fishery Data Collection in Guam	52
3.4.2	Overview of Federal Permit and Reporting Requirements	53
3.4.3	Overview of Territorial Permit and Reporting Requirements	53
3.5	Target, Non-Target, and Bycatch Species and Potential Effects of the Alternatives.	53
3.5.1	Potential Effects of the Alternatives on Bottomfish Stock Complex	54
3.6	Guam Bottomfish Fishery and Potential Effects of the Alternatives	59
3.6.1	Potential Effect of the Alternatives on the Bottomfish Fishery in Guam	60
3.7	Guam Fishing Community and Potential Effects of the Alternatives	67
3.7.1	Potential Effects of the Alternatives on the Socio-Economic Setting	68
3.7.2	Public Health and Safety at Sea	74
3.7.3	Potential for Controversy	75
3.8	Protected Species in Guam and Potential Effects of the Alternatives	75
3.9	Habitats and Vulnerable Ecosystems and Potential Effects of the Alternatives	97

3.10 Scientific, Historic, Archeological, or Cultural Resources and Potential Effects of the Alternatives	100
3.11 Physical Resources and Potential Effects of the Alternatives	100
3.12 Fishery Management Administration and Enforcement and Potential Effects of the Alternatives	101
3.12.1 Fishery Agencies and the Council	101
3.12.2 Territorial Management Agency.....	103
3.12.3 Implementation of ACLs and AMs for other Pacific Island Fisheries	104
3.13 Other Potential Effects	105
3.13.1 Biodiversity and Ecosystem Function	105
3.13.2 Highly Uncertain Effects, Unique or Unknown Risks.....	105
3.13.3 Environmental Justice.....	106
3.13.4 Potential for Future Precedent	107
3.13.5 Climate Change.....	107
4 References	120
Appendix A – DRAFT proposed regulations	125
Appendix B – Regulatory Impact review	128
Appendix C - Bottomfish projections by PIFSC	137
Appendix D - Guam P* and SEEM Working Group Reports	138

Figures

Figure 1. Map of Essential Fish Habitat (EFH) for bottomfish around Guam in Federal and territorial waters.	13
Figure 2. Example MSY, target, and rebuilding control rules.....	15
Figure 3. Kobe plot of relative biomass and relative exploitation rate from the best fitting production model for Guam bottomfish from 1982 to 2017.....	18
Figure 4. General relationship between OFL, ABC, and ACL.....	21
Figure 5. Projected biomass of the Guam bottomfish stock complex from 2020 to 2031 with annual catch levels authorized under each of the presented alternatives in addition to 0 lb, 20,097 lb, and 24,400 lb.....	33

Tables

Table 1. List of BMUS in Guam.....	11
Table 2. Catch of Guam BMUS from 2000 to 2017 used in the 2019 benchmark stock assessment (Langseth et al. 2019).....	12
Table 3. Commonly used fishery stock assessment terms	16
Table 4. Stock assessment parameters for the Guam BMUS complex.....	16
Table 5. Projection results showing annual catch (1,000 lb) applied across all years from 2020 to 2025.....	17
Table 6. Comparison of Guam bottomfish catches to the ACLs from 2012 to 2020. ACLs were not implemented in 2018 or 2019.	30
Table 7. Summary of Guam bottomfish commercial revenues from 2011 to 2020.	31

Table 8. Rebuilding parameters under Alternative 2 as required by NS1 for an overfished fishery.	33
Table 9. Summary of the biomass (B), the probability that B reaches B_{MSY} , and fishing mortality (F) for catch levels under consideration for bottomfish in Guam (2022-2032).	35
Table 10. Rebuilding parameters under Alternative 3 as required by NS1 for an overfished fishery.	37
Table 11. Rebuilding parameters under Alternative 4 as required by NS1 for an overfished fishery.	40
Table 12. Rebuilding parameters under Alternative 5 as required by NS1 for an overfished fishery.	42
Table 13. Comparison of the proposed fishery management features and expected outcomes for this action.	47
Table 14. Estimated revenues in the Guam bottomfish fishery under Alternatives 1 – 5 and under the scenarios if complementary management is implemented in territorial waters.	69
Table 15. ESA-listed sea turtles known to occur or reasonably expected to occur in waters around Guam.	78
Table 16. Marine mammals known to occur in waters around Guam.	82
Table 17. Seabirds occurring in Guam. (Source: WPFMC 2009).	85
Table 18. ESA-listed corals in Guam.	86
Table 19. EFH and HAPC for Guam BMUS.	99
Table 20. Environmental effects of the alternatives.	109

LIST OF ACRONYMS AND ABBREVIATIONS

ABC – Acceptable Biological Catch
ACL – Annual Catch Limit
ACT – Annual Catch Target
AM – Accountability Measure
B – Biomass
 B_{MSY} – Biomass at Maximum Sustainable Yield
BMUS – Bottomfish Management Unit Species
BSIA – Best Scientific Information Available
CEQ – Council on Environmental Quality
CFR – Code of Federal Regulations
CNMI – Commonwealth of the Northern Mariana Islands
CV – Coefficient of Variation
DAWR – Guam Division of Aquatic and Wildlife Resources
DPS – Distinct Population Segment
EA – Environmental Assessment
ECS – Ecosystem Component Species
EEZ – Exclusive Economic Zone
EFH – Essential Fish Habitat
ESA – Endangered Species Act
F – Fishing Mortality
 F_{MSY} – Fishing Mortality at Maximum Sustainable Yield
 $F_{rebuild}$ – Fishing Mortality associated with achieving T_{target}
FEP – Fishery Ecosystem Plan
fm – Fathoms
FMP – Fishery Management Plan
FONSI – Finding of No Significant Impact
FQ – FONSI Question
FR – Federal Register
ft – Feet
GCA – Guam Code Annotated
GPS – Global Positioning System
H – Harvest Rate
 H_{CR} – Harvest Rate associated with overfishing as determined by the Harvest Control Rule
HAPC – Habitats of Particular Concern
lb – Pounds
LOF – List of Fisheries
M – Natural Mortality
MFMT – Maximum Fishing Mortality Threshold
MMPA – Marine Mammal Protection Act
MPA – Marine Protected Area
Magnuson-Stevens Act – Magnuson-Stevens Fishery Conservation and Management Act
MSST – Minimum Stock Size Threshold
MSY – Maximum Sustainable Yield
MUS – Management Unit Species

NA – Not Applicable
n.d. – Non-Disclosed data due to confidentiality rules
NEPA – National Environmental Policy Act
nm – Nautical Miles
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
NS – National Standard
OFL – Overfishing Limit
OLE – Office of Law Enforcement
P* – Probability or Risk of Overfishing
PIFSC – Pacific Islands Fisheries Science Center
PIRO – Pacific Islands Regional Office
RIN – Regulatory Identification Number
RIR – Regulatory Impact Review
SAFE report – Stock Assessment and Fishery Evaluation report
SAP – Stock Assessment Program (PIFSC)
SDC – Status Determination Criteria
SEEM – Social, Economic, and Ecological Considerations, or Management Uncertainty
SSC – Scientific and Statistical Committee
 T_{\max} – Maximum time for rebuilding a stock or stock complex
 T_{\min} – Minimum time for rebuilding a stock or stock complex
 T_{target} – Specified time period for rebuilding a stock or stock complex
USCG – U.S. Coast Guard
USFWS – U.S. Fish and Wildlife Service
WCPO – Western and Central Pacific Ocean
WPacFIN – Western Pacific Fisheries Information Network
WPFMC (or Council) – Western Pacific Fishery Management Council
WPSAR – Western Pacific Stock Assessment Review

1 INTRODUCTION

1.1 Background Information

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) established the Western Pacific Fishery Management Council (Council) in 1976 to develop management plans for fisheries within the United States Fishery Conservation Zone around Hawaii, U.S. Pacific territories, commonwealth, and possessions of the United States in the Pacific Ocean. The bottomfish fishery in Guam primarily harvests bottomfish management unit species (BMUS), an assemblage or complex of 13 species that include emperors, snappers, groupers, and jacks (Table 1). The BMUS complex occurs in waters subject to either territorial or Federal jurisdiction. The Western Pacific Fishery Management Council (Council) and the National Marine Fisheries Service (NMFS) manage the BMUS fishery in Federal waters (i.e., the U.S. Exclusive Economic Zone, or EEZ, 3-200 miles from shore) around Guam in accordance with the Fishery Ecosystem Plan for the Mariana Archipelago (FEP), the Magnuson-Stevens Act, and implementing regulations at 50 CFR 665. The Territory of Guam manages the BMUS fishery in territorial waters (i.e., generally 0 to 3 nm from shore) and has discretion to implement management in its waters, including measures that complement fishery management in Federal waters. The most recent stock assessment, which was based on catch from both territorial and Federal waters, indicated that the Guam bottomfish multi-species stock complex is overfished (Langseth et al. 2019). On February 10, 2020, NMFS notified the Council of the change in stock status, and that the Council must amend the FEP to rebuild the stock.

Table 1. List of BMUS in Guam.

Scientific Name	Common Name(s)	Family
<i>Aphareus rutilans</i>	Red snapper, silvermouth, lehi	Lutjanidae
<i>Caranx ignobilis</i>	Giant trevally, jack	Carangidae
<i>Caranx lugubris</i>	Black trevally, jack	Carangidae
<i>Etelis carbunculus</i>	Red snapper, ehū	Lutjanidae
<i>Etelis coruscans</i>	Red snapper, onaga	Lutjanidae
<i>Lethrinus rubrioperculatus</i>	Redgill emperor	Lethrinidae
<i>Lutjanus kasmira</i>	Blueline snapper	Lutjanidae
<i>Pristipomoides auricilla</i>	Yellowtail snapper	Lutjanidae
<i>Pristipomoides filamentosus</i>	Pink snapper, paka	Lutjanidae
<i>Pristipomoides flavipinnis</i>	Yelloweye snapper	Lutjanidae
<i>Pristipomoides sieboldii</i>	Pink snapper, kalekale	Lutjanidae
<i>Pristipomoides zonatus</i>	Flower snapper, gindai	Lutjanidae
<i>Variola louti</i>	Lunartail grouper, lyretail grouper	Serranidae

The Guam bottomfish fishery consists of approximately 300 fishermen fishing for recreational or subsistence purposes (List of Fisheries (LOF); 86 FR 3028, January 14, 2021). The majority of vessels used in the fishery are less than 25 feet (ft) in length and primarily target shallow-water bottomfish species in territorial waters. Larger commercial vessels target deep-water bottomfish species at the offshore banks in Federal waters (Brodziak et al. 2012). Since 2000, catch has varied from nearly 12,000 pounds (lb) to just under 65,000 lb (Table 2). The high variability

observed in catches is likely due to high liners (i.e., commercial fishermen who are highly motivated and skilled) entering and exiting the fishery (Allen and Bartram 2008). Existing data reporting systems do not differentiate catch from territorial versus Federal waters. Therefore it is not possible to know how much of the catch is harvested in Federal waters and how much catch is harvested from territorial waters nor is it possible to estimate catch of individual species. As shown in Figure 1, the best information currently available shows that the majority of bottomfish habitat is in territorial waters (73.6 percent), and the rest is in the Federal waters located on and around offshore banks both to the northeast and southwest of Guam (26.4 percent). NMFS uses the amount of habitat as a proxy for estimating the amount of catch harvested in Federal and territorial waters.

Table 2. Catch of Guam BMUS from 2000 to 2017 used in the 2019 benchmark stock assessment (Langseth et al. 2019).

Year	BMUS Catch (lb)
2000	66,447
2001	46,427
2002	21,727
2003	29,835
2004	25,236
2005	29,046
2006	34,917
2007	18,186
2008	34,249
2009	40,735
2010	26,544
2011	54,062
2012	19,714
2013	30,243
2014	20,554
2015	11,711
2016	30,192
2017	15,684
2018	31,226
2019	31,760
2020	18,933
Average (2018-2020)	27,306

(Source: Langseth et al. 2019 and WPFMC 2021)

Since 2012, the Council and NMFS have managed the Guam bottomfish fishery in Federal waters with annual catch limits (ACLs) and accountability measures (AMs). The Council and NMFS designed the ACLs and AMs to prevent overfishing and ensure the fishery was sustainably managed (see WPFMC 2011). The Guam bottomfish fishery has not attained or

exceeded the ACL in any prior year, and up until 2019, the fishery was considered to be harvesting BMUS sustainably (Yau et al. 2016; NMFS 2017). NMFS requires large vessels (>50 ft) fishing for bottomfish in Federal waters to have a permit and report their catch. Large vessels are also prohibited from fishing or anchoring within 50 nm around Guam. Small vessels (<50ft) fishing in Federal waters are not required to report their bottomfish catch to NMFS. There is no territorial catch limit set by the Guam Government nor are any vessels fishing in territorial waters required to have a permit or report their catch. The Guam bottomfish fishery is monitored using data voluntarily provided by fishermen to DAWR through the boat-based and shore-based intercept creel survey programs (see Section 3.4). Additionally, DAWR receives commercial sales data from the mandatory commercial receipt book program.

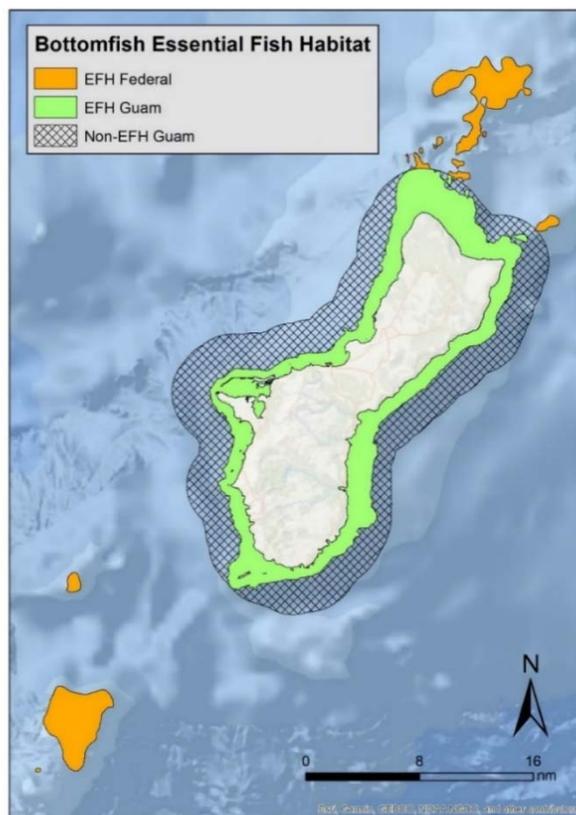


Figure 1. Map of Essential Fish Habitat (EFH) for bottomfish around Guam in Federal and territorial waters. (Source: NMFS Pacific Islands Regional Office, or PIRO)

1.2 Proposed Action

NMFS proposes to approve the Council’s recommended Amendment 6 to the Mariana FEP which would implement a rebuilding plan for Guam bottomfish consistent with Magnuson-Stevens Act Section 304(e) and implementing regulations at 50 CFR 600.310(j). The proposed rebuilding plan would set a Federal ACL for Guam BMUS of 31,000 lb at the stock complex level with an in-season AM and an a higher performance standard. As an in-season AM, if NMFS projects that the ACL would be reached, then Federal waters would be closed to bottomfish fishing at that point through the remainder of the fishing year. As a higher performance standard, if the ACL is exceeded, NMFS would close the fishery in Federal waters

until a coordinated management approach is developed that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. While NMFS would monitor catch in both territorial and Federal waters and use that when assessing catch against the ACL, the Federal catch limit would not limit catch in territorial waters.

The rebuilding plan would remain in place until such time that the stock complex is determined to be rebuilt (i.e., when the stock complex biomass (B) is above the biomass necessary to maintain the Maximum Sustainable Yield (MSY)) which could occur in response to management action or an updated assessment. NMFS and the Council would review and amend the rebuilding plan as necessary using the best scientific information available (consistent with 50 CFR 600.310(j)(3)(iv)). If the fishery is closed, reopening would occur consistent with rebuilding requirements specified under NS1 of the Magnuson-Stevens Act such that a reasonable method of restricting fishing mortality at the level needed to rebuild in the target timeframe is implemented.

1.3 Purpose and Need

The purpose of the proposed action is to comply with the requirements of the Magnuson-Stevens Act and the provisions of the FEP and implementing regulations, which require NMFS to implement management measures to rebuild the Guam bottomfish stock complex from its overfished designation, as recommended by the Council and based on the best scientific, commercial, and other information available about the fishery. The need for this action is to provide management oversight, prevent overfishing, and to provide for long-term sustainability of fishery resources while allowing fishery participants to continue to benefit from their use.

1.4 Action Area

The fishery management area for the Mariana Archipelago FEP bottomfish fishery in Guam includes the U.S. EEZ around the Island of Guam. (Figure 1). The U.S. EEZ around Guam is approximately 221,504 km². It is truncated by common borders with the EEZs of the CNMI and the Federated States of Micronesia and about 20 percent of the perimeter borders international waters. Roughly half of Guam's shoreline is surrounded by well-developed fringing coral reefs, though these reefs are accompanied by a notable offshore slope and several offshore banks including Galvez Bank, 11-Mile Bank, and Santa Rosa Reef. As of June 3, 2013, commercial fishing is prohibited in the Marianas Trench Marine National Monument (78 FR 32996), which is just over 50 nm east of Guam. Additionally, large vessels (i.e., greater than 50 ft in length) are prohibited from fishing for bottomfish in Federal waters within 50 nm around Guam (71 FR 64474, November 2, 2006).

1.5 Benchmark Stock Assessment and Status of the Stock

The Magnuson-Stevens Act requires that a fishery management plan specify objective and measurable criteria, or reference points, for determining when a stock is subject to overfishing or overfished. The FEP includes status determination criteria (SDC) that specifies when the bottomfish stock is considered overfishing or when overfishing is occurring (WPFMC 2009). Overfishing of bottomfish occurs when the fishing mortality rate (F) is greater than the fishing mortality rate for MSY (F_{MSY}) for one year or more; this is the Maximum Fishing Mortality Threshold (MFMT) and is expressed as a ratio, $F/F_{MSY} = 1.0$ (Fig. 3). Thus, if the F/F_{MSY} ratio

exceeds 1.0 for one year or more, overfishing is occurring. Bottomfish are considered to be overfished when its biomass (B) declines below the level necessary to produce MSY on a continuing basis and can be expressed as the ratio $B/B_{MSY} < 1-M$, where M is the natural mortality of the stock. Table 2 presents definitions of these commonly used terms alongside several others.

In August 2019, the NMFS Pacific Islands Fisheries Science Center (PIFSC) completed a new benchmark stock assessment for the bottomfish fisheries of Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and American Samoa (Langseth et al. 2019). The assessment is a benchmark, indicating that PIFSC re-evaluated all components of the assessment analyses and made several changes relative to previous assessments of the bottomfish fisheries. The benchmark stock assessment defined M for Pacific Island bottomfish complexes as 0.3 (Langseth et al. 2019), so bottomfish stocks become overfished when $B \leq 0.7 * B_{MSY}$; this value is known as the minimum stock size threshold (MSST) and may also be expressed as the ratio $B/B_{MSY} = 0.7$. Thus, if the B/B_{MSY} ratio falls below 0.7, the stock complex is considered overfished. The assessment results revealed that the bottomfish stock complex, which includes fish in both Federal and territorial waters off of Guam, is overfished but not experiencing overfishing (Table 4, Fig. 3). This is the first assessment that has indicated the Guam bottomfish stock complex is overfished.

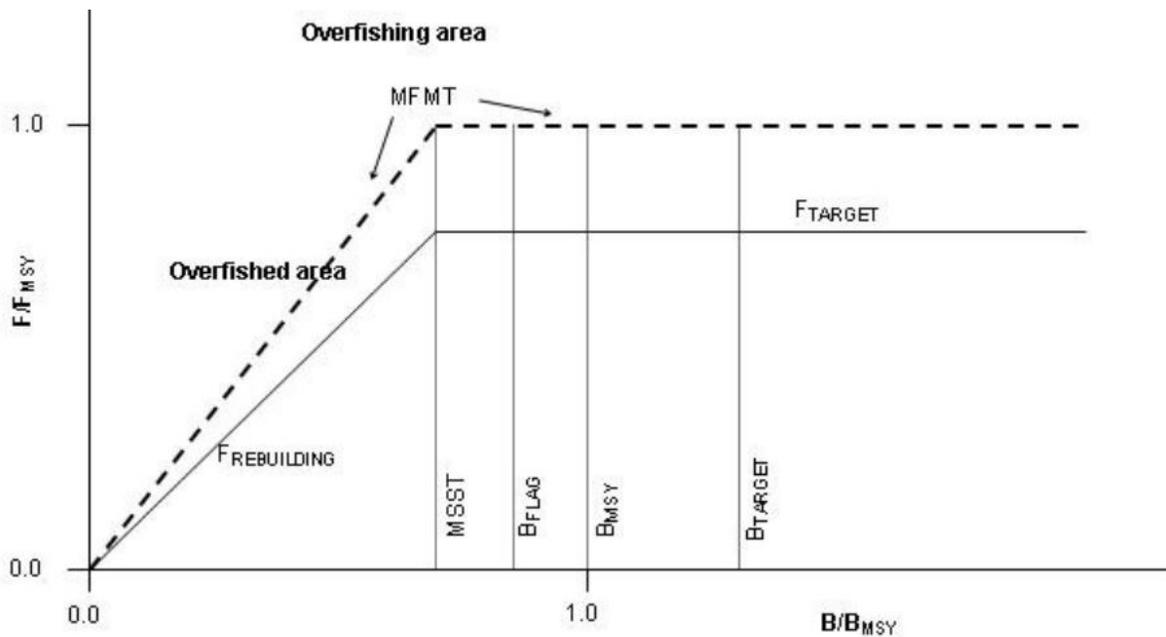


Figure 2. Example MSY, target, and rebuilding control rules.
(Source: Restrepo et al. 1998 and WPFMC 2009)

Table 3. Commonly used fishery stock assessment terms

Term	Definition
B	Biomass or the amount of fish estimated in the stock.
F	The rate at which a fish stock is caught, which includes targeted harvest and non-targeted (bycatch) harvest.
MSY	The largest long-term average catch, or yield, that can be taken from a stock year after year under prevailing conditions.
F_{MSY}	The rate of fishing mortality that, if applied over the long term, would result in catching the MSY.
B_{MSY}	The long-term average size of the stock that would be achieved by fishing at a constant fishing mortality rate equal to F_{MSY} .
Overfishing Limit (OFL)	A catch level that corresponds to the stock's MSY. Fishing above the overfishing limit would likely result in overfishing and jeopardize the stock's capacity to produce MSY.
T_{min}	The minimum amount of time the stock is expected to take to rebuild to its B_{MSY} in the absence of any fishing mortality, where "expected" refers to a 50 percent chance of attaining B_{MSY} .
T_{max}	The maximum amount of time needed to rebuild a stock to its B_{MSY} .
T_{target}	The time period for rebuilding the stock that is considered to be as short a time as possible. T_{target} cannot exceed T_{max} or 10 years, unless T_{min} exceeds 10 years.
MFMT	The rate of fishing mortality above which a stock is declared to be experiencing overfishing (i.e., fish are being removed at too rapid a rate). MFMT may not exceed F_{MSY} .
MSST	The biomass level that a stock can decline to before being declared overfished (stock abundance is too low) and requiring a rebuilding plan. It can be no lower than 50% of the B_{MSY} .
$F_{rebuild}$	The fishing mortality rate that is required to rebuild the stock.

Table 4. Stock assessment parameters for the Guam BMUS complex.

Parameter	Value	Notes	Status
MSY	42.1 (29.3-65.5)	Expressed in 1,000 lb (with 95% confidence interval)	
H_{2017}	0.11	Expressed in percentage	
H_{CR}	0.170 (0.071-0.382)	Expressed in percentage (with 95% confidence interval)	
H_{2017}/H_{CR}	0.81	Expressed as a ratio	No overfishing
B_{2017}	143.0	Expressed in 1,000 lb	
B_{MSY}	248.8 (107.1-636.8)	Expressed in 1,000 lb (with 95% confidence interval)	
B_{2017}/B_{MSY}	0.57	Expressed as a ratio	Overfished

(Source: Langseth et al. 2019)

The new benchmark stock assessment differs from previous assessments in several ways. The assessment included additional years of fishing and catch data, used new species lists, filtered catch data based on gear, standardized the catch per unit effort for covariates that could affect the catch rate, and applied a Bayesian state space surplus production model (Langseth et al. 2019). Based on information contained in the 2019 assessment, the average catch of Guam BMUS for the most recent five-year period of data (2013 to 2017) was 21,677 lb. These numbers included catch of BMUS reported at the species level, plus an estimate of BMUS catch reported under more general categories (e.g., snapper, emperor, deep bottomfish). Estimated total catch data for 2018 through 2020 are available in the Council’s annual Stock Assessment and Fishery Evaluation (SAFE) Report for the Mariana Archipelago (WPFMC 2021) but are not directly comparable.

The assessment information estimated MSY in the fishery at an annual catch of 42,100 lb (Langseth et al. 2019). Results of projected probabilities of overfishing for Guam bottomfish are presented within the assessment, which assumed that a six-year ACL set for the stock would be harvested in its entirety for its duration. The projections indicated that total catch of no more than 36,000 lb per year would result in a 50 percent probability of overfishing in 2020 through 2025 (Table 5). Therefore, to end overfishing in the fishery, the total catch of BMUS in Guam in both Federal and territorial waters must be limited to no more than 36,000 lb in each calendar year. This overfishing limit (OFL) is much lower than the MSY because the most recent biomass (B) estimates are substantially lower than the biomass needed to produce MSY (i.e., $B_{2017}/B_{MSY} = 0.38$; see Table 23 in Langseth et al. 2019).

Table 5. Projection results showing annual catch (1,000 lb) applied across all years from 2020 to 2025 where the specified median probability of overfishing ($H/H_{CR}>1$) was reached in the terminal year for Guam BMUS. Source: Table 16 in Langseth et al. 2019

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	2	2	3	3		3	0.26	21	23	24	25
0.02	3	3	4	4	5	5	0.27	22	23	24	25	26	26
0.03	4	5	5	6	6	7	0.28	23	24	25	26	26	27
0.04	5	5	6	7	8	9	0.29	23	24	26	27	27	27
0.05	5	6	7	8	9	9	0.30	24	26	26	27	27	28
0.06	6	7	9	9	10	11	0.31	25	26	27	27	28	28
0.07	7	8	9	10	11	11	0.32	25	27	27	28	28	29
0.08	8	9	10	11	12	13	0.33	26	27	27	28	29	29
0.09	9	10	11	12	13	13	0.34	26	27	28	29	29	30
0.10	9	10	12	13	13	15	0.35	27	28	29	29	30	30
0.11	10	11	13	13	14	16	0.36	27	29	29	30	30	31
0.12	11	12	13	14	15	16	0.37	28	29	30	30	31	31
0.13	11	13	14	15	17	17	0.38	29	30	30	31	31	31
0.14	12	13	15	16	17	18	0.39	29	31	31	31	31	32
0.15	13	15	16	17	18	18	0.40	30	31	31	31	32	32
0.16	13	15	17	18	19	19	0.41	31	31	32	32	32	33
0.17	14	16	17	18	19	19	0.42	31	32	32	33	33	33
0.18	15	17	18	19	19	21	0.43	32	32	33	33	33	33
0.19	16	18	19	19	20	22	0.44	32	32	33	33	33	34
0.20	16	18	19	20	21	22	0.45	33	33	33	34	35	35
0.21	17	19	20	21	22	23	0.46	33	34	35	35	35	35
0.22	18	19	21	22	23	24	0.47	34	35	35	35	35	35
0.23	19	20	22	23	23	24	0.48	35	35	35	36	35	36
0.24	19	21	22	23	24	24	0.49	35	36	36	36	36	36
0.25	20	22	23	24	25	25	0.50	36	36	36	36	36	36

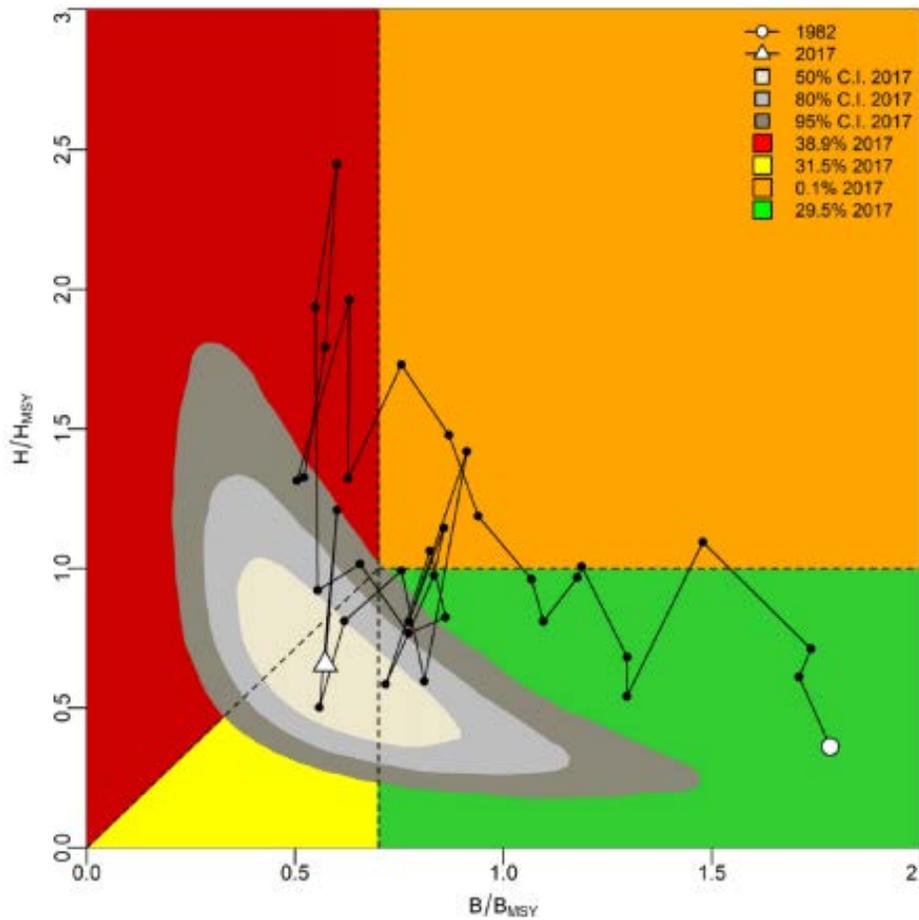


Figure 3. Kobe plot of relative biomass and relative exploitation rate from the best fitting production model for Guam bottomfish from 1982 to 2017. Source: Langseth et al. 2019.

PIFSC presented the stock assessment findings to the Council at its 180th meeting on October 22-24, 2019, in Pago Pago, American Samoa (84 FR 53685, October 8, 2019), which showed that BMUS in Guam are overfished but not experiencing overfishing. As required under National Standard (NS) 2 of the Magnuson-Stevens Act (50 CFR 600.315), an independent review by a panel of independent fishery science experts (i.e., a Western Pacific Stock Assessment Review, or WPSAR) reviewed the stock assessment and concurred that the changes to the assessment process were appropriate, improved on the previous assessments, and provided scientifically sound management advice (Martell et al. 2019). The Council’s Scientific and Statistical Committee (SSC) received the WPSAR panel reports and the peer-reviewed benchmark stock assessment at its 134th meeting on October 15-17, 2019, in Honolulu, Hawaii. Though the SSC expressed its concerns regarding uncertainties with the data used for the stock assessment, it endorsed the assessment for management purposes.

On January 10, 2020, PIFSC sent a memorandum to the Council stating that NMFS determined the 2019 benchmark stock assessment to be the best scientific information available (BSIA) consistent with NS2. On February 6, 2020, NMFS determined that the Guam bottomfish stock is overfished but not subject to overfishing (85 FR 26940, May 6, 2020). On February 10, 2020,

PIRO issued a notification informing the Council of this determination, which included the basis for the change in stock status and outlined the obligations of the Council to take immediate action to implement a plan to rebuild the stock within two years as stipulated by the Magnuson-Stevens Act.

1.6 Magnuson-Stevens Act Criteria for Rebuilding Overfished Fisheries

Here, we explain the regulations that the Council and NMFS are working under in developing this rebuilding plan measure. Pursuant to Section 304(e)(2) of the Magnuson-Stevens Act and implementing regulations at 50 CFR 600.310(j)(1), if the Secretary of Commerce (Secretary) determines at any time that a fishery is overfished, overfishing is occurring, or a stock is approaching an overfished condition, the Secretary shall immediately notify the Council and request that action be taken to end overfishing in the fishery and to implement conservation and management measures to rebuild the impacted fish stocks. As required by Magnuson-Stevens Act Section 304(e)(3) and implementing regulations at 50 CFR 600.310(j)(2), upon notification of a stock undergoing overfishing, the Council should immediately begin working with its SSC to ensure that the Acceptable Biological Catch (ABC) is set appropriately to end overfishing. The Council must prepare and implement an FEP, plan amendment, or proposed regulations for the fishery within two years to end overfishing and rebuild affected stocks. Council actions should also be submitted to NMFS within 15 months of the initial notification to ensure there is sufficient time to enact the measures. If the Council does not submit one of these items to the Secretary within two years, the Secretary will prepare an FEP or plan amendment and any accompanying regulations to stop overfishing and rebuild affected stocks of fish within nine months.

A rebuilding plan must specify a time period for rebuilding the stock that is as short as possible and generally does not exceed 10 years, taking into account the status and biology of the overfished stocks, the needs of the fishing communities, and the interaction of the stock with the marine ecosystem. The minimum time for rebuilding a stock (T_{\min}) is the amount of time the stock is expected to take to rebuild to its biomass at MSY (B_{MSY}) in the absence of any fishing mortality, where “expected” refers to a 50 percent chance of attaining B_{MSY} and T_{\min} is calculated from the first year the rebuilding plan is likely to be implemented. If T_{\min} is less than 10 years, then the maximum time for rebuilding a stock to its B_{MSY} (T_{\max}) is 10 years. The target time to rebuild a stock (T_{target}) is the specified time period for rebuilding the stock that is considered to be as short a time as possible and cannot exceed T_{\max} . The fishing mortality associated with achieving T_{target} is known as F_{rebuild} . However, this T_{\min} value assumes no harvest of the stock complex in either Federal or territorial waters, and this scenario is not realistically achievable if the Government of Guam does not take action to restrict fishing mortality in its waters. Additionally, an action prepared to end overfishing and rebuild a stock must allocate both overfishing restrictions and recovery benefits fairly and equitably among sectors of the fishery and, for a fishery managed under an international agreement, reflect traditional participation in the fishery, relative to other nations, by fishermen of the United States.

The Secretary will review rebuilding plans at least every two years to determine whether the plan has resulted in adequate progress towards ending overfishing and rebuilding the affected fish stock. The Secretary may find that adequate progress is not being made if F_{rebuild} or the associated ACL is exceeded and AMs are not correcting the operational issue that caused the

overage nor addressing any biological consequences to the stock resulting from the overage. A lack of adequate progress may also be found when the rebuilding expectations of a stock are significantly changed due to new and unexpected information about stock status, which will cause the Secretary to notify the Council to develop and implement a new or revised rebuilding plan within two years. Revising rebuilding timeframes or F_{rebuild} is not necessary unless the Secretary determines adequate progress is not being made. If a stock is not rebuilt by T_{max} , then the fishing mortality rate should be maintained at its current F_{rebuild} or 75 percent of the MFMT, whichever is less, until the stock is rebuilt or the fishing mortality rate is changed as a result of the Secretary finding that adequate progress is not being made.

1.7 Overview of ACL and AM Development Process

Federal regulations at 50 CFR 665.4 (76 FR 37285, June 27, 2011) require NMFS to implement an ACL and AM(s) for all BMUS, as recommended by the Council, based on the best scientific, commercial, and other information available for the fishery. The Guam bottomfish fishery has been managed under ACLs and AMs since 2012. This rebuilding plan uses the same process to develop the rebuilding ACLs. In accordance with the Magnuson-Stevens Act and the Mariana Archipelago FEP, there are three required elements in the development of an ACL as shown in Figure 5: calculating the ABC, determining an ACL that may not exceed the ABC, and developing AMs. In the first step, the Council's SSC calculates an ABC that is set at or below the stocks OFL. The OFL is an estimate of the catch level above which overfishing is occurring and corresponds with the MFMT. In accordance with National Standard 1 (NS1) of the Magnuson-Stevens Act, the probability of overfishing (P^* , pronounced P-star) cannot exceed 50% and should be a lower value. Thus, the ABC is the maximum amount the fishery can catch that provides at least a 50% chance, or better, of not overfishing the stock.

Second, the Council must recommend an ACL that does not exceed the ABC recommended by the SSC. An ACL set below the ABC further reduces the probability that actual catch will exceed the ABC or OFL and result in overfishing. The SSC may reduce the ABC below the OFL considering factors evaluated in a P^* analysis. The Council may then reduce the ACL below the ABC in consideration of social, economic, ecological, and management (SEEM) factors in a SEEM analysis (see Hospital et al. 2019 for SEEM considerations.). While the P^* analysis considers management uncertainty arising from underreporting and misreporting of catch, the SEEM analysis is more forward-looking and considers uncertainty arising from concerns about compliance and/or management capacity.

The third and final element in the ACL process is the inclusion of accountability measures or AMs. There are two categories of AMs, in-season AMs and post-season AMs. In-season AMs prevent an ACL from being exceeded and may include closing the fishery, closing specific areas, bag limits, setting an annual catch target (ACT), or other methods to reduce catch. Post-season AMs reduce the ACL and/or ACT in subsequent years if the ACL is exceeded in order to mitigate potential impacts to fish stocks. While harvest occurring in both Federal and territorial waters is counted against an ACL, the ACL can only restrict catch in Federal waters unless the territory adopts complementary management to restrict catch in its waters. Additionally, if any fishery exceeds an ACL more than once in a four-year period, the Council is required to re-evaluate the ACL process for that fishery and adjust the system as necessary to improve its performance and effectiveness in ensuring sustainability of the fishery.

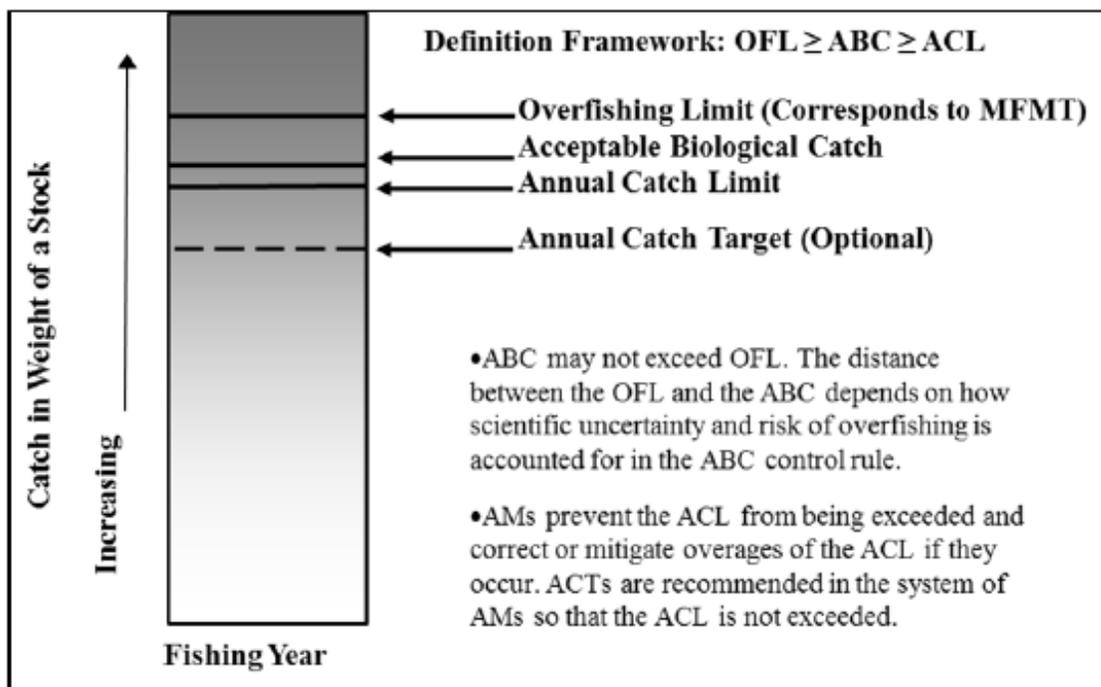


Figure 4. General relationship between OFL, ABC, and ACL.

1.8 Public Review and Involvement

The Council and its SSC convene several meetings per year, all of which are open to the public. The Council notifies and invites the public to these meetings through notices published in the *Federal Register* and on its website. The Council accepts public comment, including both oral and written statements, on meeting agenda items.

At the Council’s 134th SSC meeting on October 15-17, 2019, in Honolulu, Hawaii and the 180th Council meeting on October 22-24, 2019, in Pago Pago, American Samoa, NMFS presented the results of the most recent benchmark stock assessment for the Guam bottomfish multi-species complex (Langseth et al. 2019). Both meetings were open to the public, which was notified through the *Federal Register* (84 FR 53685, October 8, 2019) and the Council’s website. Given the location of the 180th Council meeting, public discussion focused on the stock assessment for bottomfish in American Samoa, including concerns that the data from creel surveys and the commercial receipt program used for the stock assessment are not representative of the fishery despite these being the only data available to use in stock assessments.

At the Council’s 135th SSC meeting on March 3 to 5, 2020, options were presented for the SSC to set the ABC for bottomfish fisheries in the Mariana Archipelago alongside associated P* and SEEM analyses. The SSC set the ABC for the Guam bottomfish fishery based on these analyses, and no public comments were received at this time. Subsequently, at its 181st meeting held on March 10-12, 2020, the Council received a presentation on the P* and SEEM analyses, as well as on alternatives to specify and ACL and AMs for the bottomfish fisheries in the Mariana Archipelago, including Guam. Before making their recommendation, Council members commented on the how the new benchmark stock assessment would change the ACL and the

need for incorporating management uncertainty into the ACL specification. No public comments were given at either public meeting.

At the Council's 138th SSC meeting on November 30-December 1, 2020, and the 184th Council meeting on December 2-4, 2020, both of which were held virtually via web conference, Council staff presented preliminary alternatives for parameters to be recommended for implementation in the rebuilding plan for the Guam bottomfish fishery. Both meetings were open to the public, who received notification through the *Federal Register* (85 FR 73029, November 16, 2020) and the Council's website. At the 138th SSC meeting where the SSC deliberated alternatives for the rebuilding plan, there was public comment regarding the potential for higher bottomfish biomass than estimated in the territorial bottomfish stock assessment, and that bottomfish fisheries may be expanding with more participants that are highly skilled in their fishing techniques. Additionally, PIFSC staff responded to the comment by discussing efforts by the PIFSC SAP to enhance the utilization of available data and refine assessment methodologies.

At the 184th Council meeting, the Council discussed the potential alternatives for implementing a rebuilding plan for the Guam bottomfish fishery. During the public comment period, PIFSC staff similarly focused on efforts to improve the next benchmark stock assessment and encouraged Council members to discern between the stock assessment improvement projects and the current action to implement a rebuilding plan. A public comment by a Guam fisherman expressed confusion as to how the Guam bottomfish stock was determined to be overfished, and that the designation would adversely affect Guam fishermen. The fisherman further remarked that the creel surveys do not provide adequate data to make such a determination, that stock assessment scientists did not consider the life history of BMUS species to a sufficient extent and questioned the application of additional management regimes during the COVID pandemic.

At the Council's 139th SSC meeting on March 16-18, 2021, and the 185th Council meeting on March 23-25, 2021, both of which were held virtually via web conference, Council staff presented a review of the ongoing progress of the Guam bottomfish rebuilding plan. Both meetings were open to the public, which was notified through the *Federal Register* (86 FR 11505, February 25, 2021) and the Council's website. At the 139th SSC meeting where Council staff presented the impact analysis for the alternatives under consideration, the SSC expressed confusion regarding the generation of new biomass projections to inform rebuilding timelines at this stage in the process, but an SSC member clarified that the new projections were not associated with the action timeline and were generated in accordance with NS1 requirements and the need for more precise projections. There were no public comments associated with the SSC agenda item for the Guam bottomfish rebuilding plan.

At the 185th Council meeting, Council staff also presented the impact analysis for the Guam rebuilding alternatives and preliminary environmental evaluation to the Council. Several Council members expressed concern that the data and model used to determine the overfished state of the Guam bottomfish fishery were inadequate and that the sudden change in rebuilding timelines due to updated biomass projections was alarming. A member of the public at the meeting expressed disappointment at the state of the rebuilding plan and the creel survey data used to inform it, noting that the plan will effectively take food off of the table for residents despite the stocks being healthy. The commenter stated that Federal fisheries managers need to have more dialogue with local fishing communities and suggested Federal fisheries managers provide additional

support to the territories. Also during the public comment portion of the Council's 185th meeting, PIFSC staff noted that the best path forward is to work together to improve creel survey data and identify potential regroupings for the BMUS stock complex. The Council decided to defer final action on the rebuilding plan until its subsequent meeting due to the sudden change in the expected outcomes of the presented alternatives.

At the Council's 186th meeting on June 22-24, 2021, which was held virtually via web conference, the Council took final action on the rebuilding plan for Guam bottomfish. This meeting was open to the public, which was notified through the *Federal Register* (86 FR 29251, June 1, 2021) and the Council's website. Council staff presented changes to the draft rebuilding plan, including the incorporation of outcome analyses considering the possibility of the territory implementing complementary management with this Federal action. Council members generally asked if the potential would exist to shorten the proposed rebuilding timelines if new scientific information becomes available that indicates a more positive outlook for the stock complex, and Council staff confirmed that the next stock assessment for the stock complex is scheduled to occur in 2024 and would allow for new action to be taken based on the results of the assessment. There were no public comments at this meeting. The Council ultimately took final action for the Guam bottomfish rebuilding plan, identifying Alternative 4 (i.e., an ACL of 31,000 lb with an in-season AM and higher performance standard) as its preferred alternative for the action.

1.9 NEPA Compliance

This Environmental Assessment (EA) is being prepared using the 2020 Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020, and reviews begun after this date are required to apply the 2020 regulations unless there is a clear and fundamental conflict with an applicable statute. 85 Fed. Reg. at 43372-73 (§§ 1506.13, 1507.3(a)). This EA began after September 14, 2020, and accordingly proceeds under the 2020 regulations.

On November 6, 2020, NOAA's Senior Agency Official, RDML Tim Gallaudet (Assistant Secretary of Commerce for Conservation and Management), granted a blanket waiver for time and page limits for a one-year period for all EAs and Environmental Impact Statement developed to support fishery management actions that are: developed by the regional fishery management councils (Councils) pursuant to the requirements of the Magnuson-Stevens Fishery Act, or developed by NMFS Atlantic Highly Migratory Species Management Division for actions taken under the requirements of the Magnuson-Stevens Act. Because this EA was prepared to support a Council fishery management action, the page and time limits defined in CEQ regulations are waived.

1.10 How to Comment

NMFS is seeking public comment on proposed Amendment 6, including a draft EA and Regulatory Impact Review. You may submit comments by either of the following methods:

- **Electronic Submission:** Submit all electronic comments via the Federal e-Rulemaking Portal. Go to www.regulations.gov and enter NOAA-NMFS-2021-0104 in the Search box, click the "Comment" icon, complete the required fields, and enter or attach your comments.

- Mail: Send written comments to Michael D. Tosatto, Regional Administrator, NMFS Pacific Islands Region (PIR), 1845 Wasp Blvd. Bldg. 176, Honolulu, HI 96818.

NMFS will also solicit comments on the proposed action for a 45-day period when the proposed rule is published. NMFS will consider comments received within both comment periods when developing the final rule for the proposed rebuilding plan.

1.11 List of Preparers and Reviewers

Western Pacific Fishery Management Council

Thomas Remington, Contractor, *Preparer*

Marlowe Sabater, Island Fisheries Ecosystem Scientist, *Preparer*

NMFS PIRO Sustainable Fisheries Division (SFD)

Kate Taylor, Fishery Management Specialist, PIRO SFD *Preparer*

Phyllis Ha, PIRO SFD *Reviewer*

Ron Dean, *PIRO NEPA Coordinator Reviewer*

2 DESCRIPTION OF ALTERNATIVES AND OVERVIEW OF THE REBUILDING PLAN

The Council developed the alternatives for rebuilding the Guam bottomfish stock, pursuant to Magnuson-Stevens Act requirements, in response to the notification by NMFS that the Guam bottomfish fishery is overfished but not experiencing overfishing. The Council generated five alternatives to evaluate a range of management options from a baseline of no Federal action (Alternative 1) to the Federal action that would rebuild the bottomfish stock complex in the shortest time possible (closing the bottomfish fishery in Federal waters, Alternative 5). Alternative 2 would implement an ACL and in-season AM that would close the Guam bottomfish fishery in Federal waters when the annual catch reaches 27,000 lb, which provides an authorized level of catch that would prevent overfishing and rebuild the stock in five years. Additionally, NMFS would implement a higher performance standard that would close the fishery in subsequent years after the ACL is reached until NMFS and the Government of Guam develop a coordinated management approach and implement regulations that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Alternatives 3 and 4 would implement ACLs for the bottomfish fishery at 16,299 lb and 31,000 lb to rebuild the stock in three and nine years, respectively, with the same AM and higher performance standard as Alternative 2. Alternative 5 would implement a closure of Federal waters to bottomfish fishing with an authorized catch level that would allow rebuilding in two years. Each alternative would have at least a 50 percent chance of rebuilding within the estimated timeframe assuming catches in both territorial and Federal waters are limited to the amount authorized. If the territory does not implement complementary management with this Federal action to limit catch in its waters to the authorized catch levels, rebuilding could still occur within 10 years but the time in which it takes to attain the rebuilding target would be delayed. These alternatives are described in detail below.

2.1 Development of the Alternatives

The process of developing ACL alternatives, generating rebuilding timelines, and analyzing potential impacts incorporates multiple sources of catch data: the time series of catch presented in the stock assessment (Langseth et al. 2019) and the time series of catch included in the Council's annual SAFE report (WPFMC 2021).

Generally, the catch estimates in a stock assessment are considered to be more complete than the data in an annual SAFE report due to the combined consideration of information from creel surveys and commercial receipts. The catch estimates in the 2019 stock assessment are also considered BSIA. However, the use of catch estimates from the Council's 2020 SAFE report was also considered because it provides estimates through 2019, whereas the stock assessment time series ends in 2017. However, during the development of this rebuilding plan in January 2021, the PIFSC SAP appended the catch time series available in the stock assessment with estimates of catch for 2018 through 2020 (Appendix C) at the request of the Action Team for this rebuilding plan. The Action Team ultimately decided that the new catch data provided by the PIFSC SAP should be utilized because the stock assessment and the more recent catch update are BSIA. Thus, the new PIFSC SAP catch data are used to generate the biomass projections and associated rebuilding timelines in this EA.

At its 181st meeting on March 9-12, 2020, held in Honolulu, Hawaii, the Council deliberated on the specification of the ACL for fishing years 2020-2023 for the Guam bottomfish fishery. However, given that the Council must take action by February 2022 to rebuild the stock complex, the Executive Director and the Council Chair, under authority granted by the Council, deemed only the ACLs for 2020-2022. The Council recommended an ACL of 27,000 lb, which represents a 31 percent risk of overfishing. The Council noted that this level of catch would allow harvest to be maximized while preventing overfishing and allowing the Guam bottomfish stock to rebuild with a 50 percent chance of catch not exceeding the ACL. A downward adjustment, post-season accountability measure also was recommended by the Council, where the ACL for the subsequent year will be reduced by the amount of overage from the recent three-year average catch relative to the ACL for the fishery. NMFS implemented the 2020-2022 ACL on May 7, 2021 (86 FR 24511). Thus, this is the current status quo baseline.

At the Council's 138th SSC meeting from November 30 to December 1, 2020, the SSC deliberated on providing a recommendation to the Council for the provisions of the rebuilding plan for Guam bottomfish. The SSC members noted the trade-offs present between the various alternatives, and recommended that the Council either select Alternative 2 (27,000 lb ACL), which would allow rebuilding in a relatively shorter amount of time, or Alternative 4 (31,000 lb ACL), which would promote rebuilding in a relatively longer time frame but with a lower chance that catch would exceed the ACL and cause rebuilding to be delayed. At the 184th Council meeting in December 2020, the Council took initial action and recommended implementing a rebuilding plan for Guam bottomfish with an ACL of 31,000 lb and an in-season AM to close the fishery if the ACL is projected to be reached. The Council noted that selecting a higher ACL and potentially prolonging the rebuilding timeframe would be preferable to recommending a lower ACL with a higher likelihood of being exceeded, which would also delay rebuilding. The post-season AM was removed due to its inability to address the operational issues in the fishery that would cause the exceedance of the ACL (see Section 2.7.6).

Initial rebuilding projections developed by PIFSC were based on landings data from the stock assessment which only included data through 2017. At the request of Council staff, PIFSC updated the rebuilding projections to include more recent landing data. In early 2020, PIFSC updated the rebuilding projections with landings data from 2018 and 2019. At the time, landings data from 2020 was not available. At the Council's 139th SSC meeting on March 16-18, 2021, the SSC discussed the revised alternatives in the rebuilding plan due to changes in the biomass projections provided by the PIFSC. At its 185th meeting from March 23-25, 2021, the Council planned to take final action on the Guam bottomfish rebuilding plan, but the Council deferred action until the projections could include landings data from 2020. PIFSC revised the projections and, at the 186th meeting on June 22-24, 2021, presented the Council with the final updated projections that showed an ACL of 31,000 lb would rebuild the stock within nine years. The Council took final action and selected Alternative 4 as its preferred alternative.

2.2 Features Common to the Alternatives

Each of the alternatives considered assumes that all existing Federal and local resource management regulations would continue alongside non-regulatory monitoring of catch through the creel survey expansions by NMFS and the DAWR commercial reporting system. In Guam archipelagic fisheries, the fishing year begins January 1 and ends on December 31. The Council

has two years to prepare and implement an FEP, plan amendment, or proposed regulations to rebuild an overfished stock and/or end overfishing for that stock (see Magnuson-Stevens Act Section 304(e) and 50 C.F.R. § 600.310(j)). The Council previously recommended an ACL and post-season AM for the Guam bottomfish fishery for 2020 through 2022 at its March 2020 meeting, which can be maintained or replaced by the provisions of the rebuilding plan once implemented. There is little available information on the life history for Guam BMUS to inform the action alternatives, and little is known about how the stock complex interacts with the surrounding marine ecosystem.

There is no Federal permit or reporting required to fish for BMUS in Guam for vessels less than 50 ft nor is a commercial fishing license required for fishermen fishing in territorial waters. DAWR encourages fishing vendors and dealers to participate in their commercial reporting program, but there have been very few participating vendors. Additionally, DAWR performs voluntary shore- and boat-based creel surveys to gather data on fishing methods used, fishing effort, and annual catch before transferring these data to NMFS. Under each of the alternatives, NMFS would work with DAWR to encourage timely processing of data and would track catches toward any applicable Federal catch limit as data are provided by DAWR. The fishery would continue to be monitored in the event of a Federal closure. The following descriptions and analyses account for both possibilities of the territory implementing or not implementing complementary management with this Federal action. The analyses are based on an effective date of January 1, 2022, to provide a baseline for comparison if the measures were enacted at the beginning of the-current fishing year.

2.2.1 Features common to Alternative 2 through 4

Under Alternatives 2, 3, and 4, NMFS would review progress of the catches relative to the implemented ACL based on data reports from the Guam DAWR, which monitors the bottomfish fishery through its creel survey program. The in-season AM would require that NMFS close Federal waters around Guam to bottomfish fishing through the remainder of the year when NMFS projects that the fishery would attain the ACL or immediately if it is determined that the fishery has exceeded the ACL. Because NMFS would not be able to track catches for the fishery in near-real time, Alternatives 2, 3, and 4 would utilize a predetermined scheme to allow for in-season monitoring of the fishery over the course of each fishing year for the duration of the rebuilding plan. The in-season monitoring plan would rely on the use of expanded estimates from the creel survey program in Guam. Although creel survey data are expected to be associated with high scientific uncertainties when expanded during the fishing year, these data represent BSIA to NMFS for the purposes of in-season monitoring under this action. Additionally, this action would represent the first attempt to utilize in-season monitoring for implementing a closure for the Guam bottomfish fishery. Previously, the Council and NMFS were not satisfied with the amount of scientific uncertainty in the data when used for in-season monitoring. However, more recently, the overfished designation for the stock complex has prompted the Council and NMFS to reconsider the use of creel survey data for in-season monitoring despite the associated uncertainties because tracking the fishery throughout the fishing year is necessary to ensure that the fishery is adhering to the proposed timelines of the rebuilding plan.

To allow for in-season review of the total running catches for the Guam bottomfish fishery, NMFS would periodically determine the number of catch interviews for which DAWR has provided data. After DAWR transmits the monthly data, NMFS would tally the number of available catch interviews. When DAWR has conducted sufficient interviews to allow for appropriate expansion of the available data based on scientific uncertainty, NMFS would estimate the total catch for the fishing year to that point. NMFS expects the first expansion to take place roughly halfway through the year, mid-summer in Guam when bottomfish catches are typically high. However, since fewer interviews increases the uncertainty in the catch estimates for the expansion time period, it is also expected that this semi-annual expansion would have high uncertainties associated with the data. After the initial expansion, NMFS would then perform additional expansions for the entire year on a month-to-month basis, or as DAWR is able to transmit creel survey data, whichever is more frequent. Performing expansions of the running total annual catch for the fishery each month for the second half of the year would allow NMFS to appropriately review harvest relative to the implemented ACL and project if the ACL would be attained in the upcoming month. Utilizing these data, NMFS could then determine if a closure of the fishery in Federal waters is necessary in accordance with the in-season AM.

NMFS and the Council would use the creel survey data to monitor the fishery over the course of a fishing year until a more reliable catch monitoring system is in place. For example, ongoing modernization efforts of the WPacFIN database management system will allow for near real-time access to the catch interview and participation data. Additionally, a potential future implementation of mandatory commercial permitting and reporting requirements for the Guam bottomfish fishery would generate census data for the commercially-caught bottomfish. Depending on compliance, this could be an improvement over the existing data collection systems, and NMFS would conduct in-season monitoring based on the BSIA. The Council is supporting Guam in its development of territorial regulations to require licensing and reporting for commercial fisheries, but implementation of the regulations may not occur for several years.

Additionally, to ensure that the implemented ACL can result in rebuilding of the BMUS stock complex, the Council proposes a higher performance standard in which, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. This would represent a higher performance standard than described under 50 CFR 600.310(g), which requires that the Council re-evaluate and adjust the ACL system to ensure its performance and effectiveness if catches exceed any ACL more than once in a four-year period. Whether these management provisions also apply to territorial waters depends on whether the Guam Government decides to implement management that complements the Federal action. This would include, for example, closing territorial waters if the ACL is expected to be attained before the end of the fishing year.

2.2.2 Features Common to Alternatives 2 through 5

The ability to coordinate a closure of both Federal and territorial waters would improve management measures associated with a designated catch limit, but Guam does not have regulations in place to close bottomfish fishing in territorial waters if a Federal catch limit is reached. For this reason, the following outcome analysis for each action alternative accounts

only for action that NMFS can take within its regulatory authority. If the Guam Government implements complementary management with this Federal action, it is likely that the bottomfish stock complex would be allowed to rebuild within the proposed timeframes. However, if the territory does not implement complementary management, NMFS expects that fishing would continue in territorial waters in the event of a Federal closure and the level of authorized catch would be exceeded. This could delay the rebuilding of the fishery relative to the estimated timelines if the ACL is exceeded by a large amount in any one year.

NMFS and the Council would review and amend the rebuilding plan as necessary if new information becomes available that is deemed BSIA, such as a new stock assessment. Additionally, the fishery would be reopened in Federal waters if a coordinated and reasonable method of restricting fishing mortality at the level needed to rebuild in the target timeframe is implemented by NMFS and the Territory.

2.3 Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

On May 7, 2021, NMFS published the final rule for the ACLs from 2020 through 2022 for the Guam bottomfish fishery (86 FR 24511). Alternative 1 would continue the ACLs and AM proposed for 2020 through 2022, which include an ACL of 27,000 lb and a post-season AM to reduce the ACL in the subsequent fishing year by the amount of overage if the three-year running average of catch exceeds the ACL for the preceding fishing year. There would be no in-season AM to prevent the ACL from being exceeded but with a post-season AM to correct overages. Catches from both territorial and Federal waters would be counted towards the ACL. The post-season AM would require NMFS to account for the total estimated catch against the ACL at the end of the fishing year, and if the recent three-year average catch exceeded the ACL, the ACL for the subsequent year would be reduced by the amount of overage. This ACL would be implemented for fishing year 2023 and reviewed and updated through the annual ACL process.

Since this alternative would apply the same management measures most recently implemented for the Guam bottomfish fishery, Alternative 1 would serve as the status quo and environmental baseline alternative against which effects on the human environment of action alternatives can be compared. These provisions would be implemented in lieu of a rebuilding plan with a new ACL, AMs, or other associated management measures for BMUS in Guam to rebuild the stock. This alternative would not comply with Magnuson-Stevens Act requirements to rebuild the stock or the purpose and need of this EA.

2.3.1 Expected Fishery Outcome (Alt. 1)

Under Alternative 1, NMFS expects the Guam bottomfish fishery to continue fishing as it has in the past and harvest annual catch of Guam BMUS similar to recent years. NMFS would apply the same Federal ACL implemented for the fishery in 2020 through 2022. This alternative would implement an authorized catch limit below both the OFL and MSY but provide no in-season mechanism to restrict catch from exceeding the 27,000 lb ACL.

Annual catches have been less than the implemented Federal ACLs for the Guam bottomfish fishery since their inception in 2012 (Table 6). Due to the lack of in-season closures, ACLs in these years did not functionally constrain the fishery. Catches in 2018 and 2019 (when no ACL

or AMs were implemented) were comparable to levels of fishery catch under years with an ACL (e.g., in 2013 and 2016) and were notably less than catches in years prior to the implementation of ACLs for the fishery (e.g., 2008, 2009, and 2011; Table 1). This suggests that fishery performance does not change dramatically whether or not ACLs and post-season AMs are implemented, but it is possible that the fishery may have slightly increased catch in the absence of ACLs due to inherent interannual variability in the fishery.

Catch in 2020 was lower than both the OFL (36,000 lb) and the long-term MSY (42,100 lb), as well as catch levels for the two preceding years. Therefore, recent fishery performance can be used to approximate behavior in the fishery while unconstrained (i.e., in the absence of an in-season AM), and it is expected that catches under this alternative would continue to be similarly variable to past years. However, the most recent three year average (27,306 lb) would exceed the ACL and it could result in an overage adjustment being applied to the ACL in subsequent years. If recent fishery performance is maintained, it would take the stock a projected five years to rebuild from its overfished state (Appendix C). This alternative would not provide a viable mechanism to ensure rebuilding the stock complex if participation or catch were to increase in future years. NMFS expects these outcomes to occur regardless of the implementation of complementary management by the territorial government since there would still be no way to restrict bottomfish catch in territorial waters.

Table 6. Comparison of Guam bottomfish catches to the ACLs from 2012 to 2020. ACLs were not implemented in 2018 or 2019.

Year	ACL (lb)**	Catch (lb)*	Percent of ACL
2012	48,200	19,714	40.90
2013	66,800	30,243	45.27
2014	66,800	20,554	30.77
2015	66,800	11,711	17.53
2016	66,000	30,192	45.75
2017	66,000	15,864	24.04
2018	NA	31,226	NA
2019	NA	31,760	NA
2020	27,000	18,933	70.12

(Source: *Appendix C and **WPFMC 2021)

2.3.2 Estimated Conservation and Management Benefit (Alt. 1)

This alternative would not ensure that the stock complex can rebuild within ten years if fishery participation and catch increase during the time frame of the rebuilding plan. This could result in the stock complex continuing to persist in its overfished state and prolong the time needed to improve the BMUS stock status relative to the action alternatives. There would be some minor management benefits under Alternative 1, as NMFS would not need to track bottomfish catch in-season nor apply an in-season Federal fishery closure. The implementation of complementary management with this Federal action by the territorial government would not change the estimated conservation and management benefits associated with this alternative.

2.3.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 1)

This alternative would not have short-term cultural, economic, or social impacts relative to the action alternatives because it would implement the same management for the fishery as in 2020 and would not functionally constrain bottomfish fishing activity. Thus, Alternative 1 is not expected to adversely affect the fishing communities in the short term. However, Alternative 1 would not provide a mechanism to ensure that the stock complex does not surpass sustainability thresholds identified in the benchmark stock assessment (Langseth et al. 2019). Increased levels of annual catch relative to the recent average may cause the stock complex to persist in its overfished state and prolong the time to rebuild the BMUS stock, which may have longer-term cultural, economic, and social impacts than the action alternatives if the decreased health of the stock complex impacts fishery catches in the future. If the territory implements complementary management, it would not change the cultural, economic, and social impacts expected under this alternative since it would not functionally constrain bottomfish fishing activity.

Although commercial sales data for Guam bottomfish are confidential for 2019 and 2020 due to a limited number of vendors reporting, data for 2017 and 2018 (Table 7) can be used to estimate recent trends in the commercial fishery. Since the fishery, and therefore, commercial sales are expected to remain consistent under Alternative 1, the Council anticipates that commercial fishermen would sell around 17.5 percent (i.e., the average of 2017 and 2018 values) of recent average catch, or 4,779 lb, annually during the rebuilding plan based on available data. At the price of \$4.82 per lb (i.e., the average of 2017 and 2018 values), expected revenue would be \$23,035. Using the estimated number of 300 fishery participants, each fisherman would earn approximately \$77. This alternative represents the same management the fishery experienced in 2020 and would not functionally constrain bottomfish fishing activity in Guam, so it is not expected to adversely affect the fishing communities in Guam. Non-commercial fishing (inclusive of recreational, sustenance, and cultural fishing) would likely also be unaffected in the short-term under Alternative 1.

2.4 Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, NMFS would implement a rebuilding plan with an ACL of 27,000 lb for the Guam bottomfish fishery with an in-season AM and higher performance standard to allow for the rebuilding of the Guam bottomfish stock complex. While NMFS would count catches from both Federal and territorial waters towards the ACL, NMFS only has authority to manage the fishery in federal waters and the Territory of Guam may implement management measures in territorial waters to complement federal rebuilding management at its discretion.

Table 7. Summary of Guam bottomfish commercial revenues from 2011 to 2020.

Year	Estimated total catch (lb)*	Estimated pounds sold (lb)**	Percent sold**	Estimated adjusted revenue (\$)**	Adjusted average price per pound (\$)**
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2011	54,062	n.d.	NA	n.d.	NA
2012	19,714	n.d.	NA	n.d.	NA
2013	30,243	n.d.	NA	n.d.	NA
2014	20,554	n.d.	NA	n.d.	NA
2015	11,711	n.d.	NA	n.d.	NA
2016	30,192	n.d.	NA	n.d.	NA
2017	15,864	4,002	25.2	18,131	4.53
2018	31,226	3,028	9.7	15,443	5.10
2019	31,760	n.d.	NA	n.d.	NA
2020	18,933	n.d.	NA	n.d.	NA
Three-year avg.	27,306	n.d.	NA	n.d.	NA

(Source: *Appendix C and **WPFMC 2021)

n.d. = Data not disclosed due to confidentiality (less than three vendors and/or dealers reporting).

NA = Not available.

NMFS would implement the rebuilding plan starting in 2022 until such time that the Guam bottomfish stock complex is determined to be rebuilt (i.e., attained its B_{MSY} as specified in Langseth et al. 2019). This proposed level of catch, if maintained for both territorial and Federal waters, would be able to rebuild the Guam bottomfish stock complex to B_{MSY} in five years. As an in-season AM, NMFS would close Federal waters around Guam to bottomfish fishing when the agency estimates the fishery would attain the ACL, or immediately if the agency determines that the fishery has attained or exceeded the ACL. As a higher performance standard for this rebuilding plan, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. This higher performance standard was included to address the possibility that the Guam Government may not implement complementary management with this Federal action to maintain overall catch of the stock below the level of authorized catch, which could delay rebuilding relative to the proposed timeline.

The development of the ACL in Alternative 2 was done in accordance with the process described in the Mariana FEP, the Magnuson-Stevens Act, and implementing regulations. The SSC recommended an ABC based on a risk of overfishing (P*, pronounced P-star) analysis. The P* analysis determined a reduction of 19 percent from the OFL for the ABC, meaning that the Guam bottomfish fishery should be managed at a 31 percent risk of overfishing ($ABC = OFL - P^* \text{ analysis} = 50\% - 19\% = 31\%$; WPFMC 2020b) which corresponds to a catch level of 27,000 lb. The SEEM working group suggested no further reduction in the risk of overfishing to minimize further impacts of implementing the rebuilding plan on the fishermen and the local fishing community. The rebuilding parameters for Alternative 2 are presented in Table 8.

In summary, Alternative 2 reflects the implementation of a management regime similar to the Council's most recent ACL specification but adds an in-season AM and higher performance standard and removes the post-season AM. An annual catch of 27,000 lb, if maintained for both

territorial and Federal waters, would both prevent overfishing and ensure that the fishery would rebuild within 5 years while allowing catch to the community at slightly less than recent average levels. However, in the event the Federal fishery is closed, either through the in-season AM or the higher performance standard, if the territory does not implement complementary management then fishing in territorial waters is expected to continue and it is likely that the rebuilding timeline would be extended beyond five years. Assuming that future catches would be consistent with recent averages, that the displacement of effort from Federal to territorial waters would be minor, and that complementary management would not be implemented, Alternative 2 would minimize adverse impacts to both the Guam bottomfish stock complex and fishing community while supporting rebuilding within the required time frame.

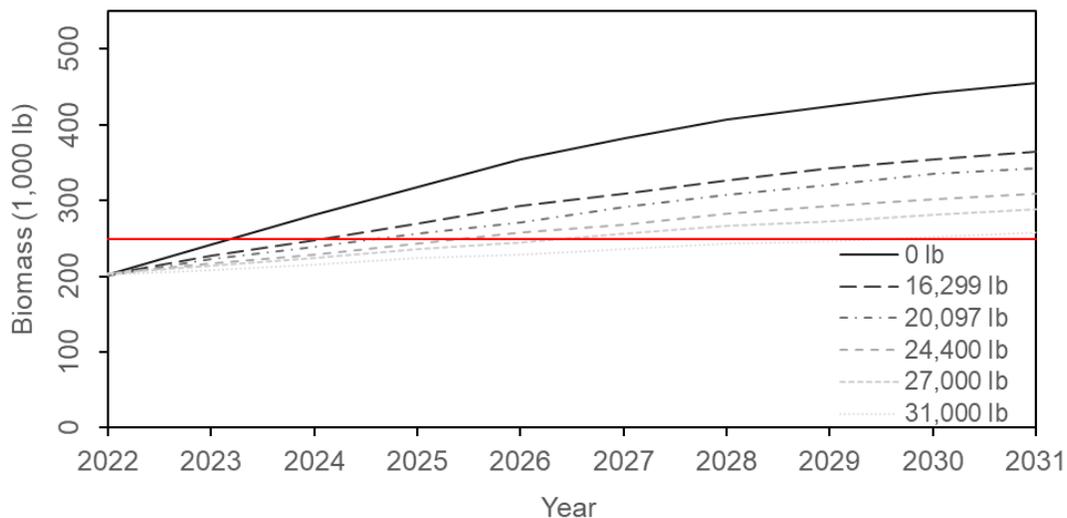


Figure 5. Projected biomass of the Guam bottomfish stock complex from 2020 to 2031 with annual catch levels authorized under each of the presented alternatives in addition to 0 lb, 20,097 lb, and 24,400 lb. The red line denotes B_{MSY} at 248,800 lb. Projected biomass values for each year represent estimates for the beginning of the listed year. (Source: Appendix C)

Table 8. Rebuilding parameters under Alternative 2 as required by NS1 for an overfished fishery.

Parameter	Value
T_{min}	2 years
T_{target}	5 years
T_{max}	10 years
$F_{rebuild}$	0.111 – 0.135

2.4.1 Expected Fishery Outcome (Alt. 2)

Under Alternative 2, total annual catch of Guam BMUS would be either slightly or notably less than recent years depending on variability, displacement, voluntary reductions in fishing effort by fishermen, and the implementation of complementary management in territorial waters among other factors. If complementary management is not implemented, the fishery is not expected to

change the way it fishes with respect to the Status Quo, but it would change with respect to catch and areas fished if bottomfish fishing was prohibited in Federal waters. Furthermore, fishermen who fish mainly in Federal waters may be affected more by a temporary closure of Federal water or substantially by a longer term closure of federal waters. If NMFS implements the in-season AM (i.e., closes Federal waters) without complementary management in territorial waters it is likely that total catch would still exceed the proposed ACL due to the continuation of fishing in and potential displacement of fishing effort into territorial waters. It is not clear how often annual total catch would exceed the ACL if catches are similar to the recent years, as annual catch from five of the past 10 years has exceeded the proposed ACL (Table 4).

If complementary management is implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, participation, or intensity while the fishery remains open compared to the Status Quo. However, the fishery would experience large impacts to operations and associated harvests if bottomfish fishing was prohibited in both Federal and territorial waters (either through the in-season AM being triggered or the higher performance standard being implemented). It is less likely that catch would exceed the proposed ACL if a complementary closure is implemented in territorial waters at the same time NMFS implements any necessary in-season AM. This would also reduce the likelihood that NMFS would need to implement the higher performance standard. The implementation of any in-season AM, if triggered, would likely be late in the fishing year if catches continue as they have in recent years. Regardless if complementary management is implemented or not, catch levels under Alternative 2 would be more restrictive than the recent annual average catch due to the in-season AM and the higher performance standard. Refer to Section 3.6.1 for additional analysis.

Table 9. Summary of the biomass (B), the probability that B reaches B_{MSY} , and fishing mortality (F) for catch levels under consideration for bottomfish in Guam (2022-2032). B_{MSY} for Guam bottomfish is 248,800 lb. For each catch level under consideration, the grey cells indicate the earliest date rebuilding is projected to occur (i.e., when there is a 50% probability that B has reached B_{MSY}) and the associated B and F value. (Source: Appendix C)

Year of Rebuilding	0 lb			16,299 lb			27,000 lb			31,000 lb		
	B (lb)	Prob. $B \geq B_{msy}$	F	B (lb)	Prob. $B \geq B_{msy}$	F	B (lb)	Prob. $B \geq B_{msy}$	F	B (lb)	Prob. $B \geq B_{msy}$	F
0	201,522	0.370	0	201,886	0.368	0.084	198,243	0.362	0.142	199,772	0.368	0.166
1	239,132	0.477	0	226,492	0.437	0.075	210,620	0.402	0.135	207,476	0.396	0.161
2	277,534	0.570	0	247,817	0.493	0.068	220,890	0.437	0.128	212,897	0.413	0.155
3	317,296	0.641	0	269,748	0.541	0.062	233,707	0.461	0.122	220,196	0.432	0.149
4	349,651	0.694	0	292,733	0.585	0.057	241,286	0.484	0.117	226,430	0.451	0.145
5	377,420	0.745	0	309,372	0.616	0.054	252,789	0.509	0.111	234,621	0.466	0.141
6	404,639	0.784	0	326,660	0.644	0.051	264,156	0.530	0.107	240,810	0.484	0.137
7	423,419	0.813	0	342,332	0.671	0.049	272,918	0.546	0.104	246,661	0.497	0.134
8	441,265	0.837	0	355,137	0.693	0.047	281,895	0.561	0.101	248,168	0.499	0.131
9	454,623	0.858	0	365,103	0.712	0.046	289,847	0.577	0.098	250,116	0.502	0.128
10	463,810	0.872	0	374,311	0.728	0.045	297,031	0.585	0.097	254,269	0.511	0.126

(Source: Appendix C)

2.4.2 Estimated Conservation and Management Benefit (Alt. 2)

Alternative 2 is expected to prevent overfishing and rebuild the Guam bottomfish stock complex in five years while allowing relatively less harvest to occur than the status quo. The timeframe for rebuilding is ultimately dependent on whether the territory decides to implement complementary management or not. If Federal waters are closed through the higher performance standard, territorial waters remain open, and annual catch is above 27,000 lb, then the timeline for rebuilding could be extended. With a complete moratorium in both Federal and territorial waters, the fishery could rebuild within two years from the time of the closure. Regardless if complementary management is implemented or not, this alternative would constrain catch and promote rebuilding to a greater extent than the status quo alternative due to the application of the in-season AM. Thus, the proposed management would mitigate adverse impacts to the Guam bottomfish stock from fishing if harvests consistent with the recent average occur, provide conservation benefits relative to the status quo, prevent overfishing, and promote rebuilding within the required timeframe. Refer to Section 3.5.1 for additional analysis.

2.4.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 2)

The intention of Alternative 2 is to rebuild the Guam bottomfish stock complex from its overfished state while mitigating cultural, economic, and social impacts to Guam communities by allowing a level of catch similar to recent years. The extent of the impacts to the community would be dependent on whether the territorial government implements complementary management or not. Without complementary management and while the total catch remains below the ACL, there would be no community impacts. If catches are similar to recent years, then it is likely that if the ACL is attained it would be very late in the year. Therefore, the impacts could increase slightly if the Federal fishery is closed due to the in-season AM. If the Federal fishery is closed through the higher performance standard, the impacts would be greater to fishermen who harvest predominately in Federal waters. However, fishing would continue to occur in territorial waters if fishing in Federal waters is prohibited, and it is not clear if displacement of fishing effort into territorial waters would mitigate the economic impact to commercial fishermen. Thus, large cultural, economic, or social impacts are not expected under Alternative 2 if complementary management is not implemented. If complementary management is implemented, catch would be limited to 27,000 lb, which is the same the status quo. Under this scenario, community impacts would occur if both Federal and territorial waters are closed due to the in-season AM but, since this is not expected to happen until late in the year, the impacts would be minimal. However, if the higher performance standard was applied, then catch and revenue would be reduced to zero. This would likely result in large cultural, economic, or social impacts to the Guam fishing community. Refer to Section 3.9.1 for additional analysis.

2.5 Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, NMFS would implement a rebuilding plan with an ACL of 16,299 lb for the Guam bottomfish fishery with an in-season AM and higher performance standard to allow for the rebuilding of the Guam bottomfish stock complex. This ACL was developed based on the estimated catch in 2019 of 37,701 lb which exceeds the ACL of 27,000 lb by 10,701 lb ($37,701 - 10,701 = 16,299$ lb, WPFMC 2020a). While NMFS would count catches from both Federal and

territorial waters towards the ACL, NMFS only has authority to manage the fishery in federal waters and the Territory of Guam may implement management measures in territorial waters to complement federal rebuilding management at its discretion.

NMFS would implement the rebuilding plan starting in 2022 until such time that the Guam bottomfish stock complex is determined to be rebuilt. This proposed level of catch, if maintained for both territorial and Federal waters, has a 54 percent chance to rebuild the Guam bottomfish stock complex to B_{MSY} in three years (Appendix C). As an in-season AM, NMFS would close Federal waters around Guam to bottomfish fishing when the agency estimates the fishery would attain the ACL, or immediately if the agency determines that the fishery has attained or exceeded the ACL. As a higher performance standard for this rebuilding plan, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. This higher performance standard was included to address the possibility that the Guam Government may not implement complementary management with this Federal action to maintain overall catch of the stock below the level of authorized catch, which could delay rebuilding relative to the proposed timeline.

In summary, annual catch of 16,299 lb, if maintained for both territorial and Federal waters, would both prevent overfishing and ensure that the fishery would rebuild in shorter amount of time than Alternative 2. However, under this alternative, catch levels would be more constrained and it may cause greater impacts to Guam’s fishing communities than Alternatives 1 or 2. The rebuilding parameters for Alternative 3 are presented in Table 10.

Table 10. Rebuilding parameters under Alternative 3 as required by NS1 for an overfished fishery.

Parameter	Value
T_{min}	2 years
T_{target}	3 years
T_{max}	10 years
$F_{rebuild}$	0.062 – 0.075

2.5.1 Expected Fishery Outcome (Alt. 3)

Under Alternative 3, total annual catch of Guam BMUS would be more constrained due to the in-season AM than the status quo and Alternative 2, but the amount of the impact depends on variability, displacement, voluntary reductions in fishing effort by fishermen, and the implementation of complementary management in territorial waters among other factors. If complementary management is not implemented, the fishery is not expected to change the way it fishes with respect to the Status Quo, but it would change with respect to catch and areas fished if bottomfish fishing was prohibited in Federal waters. Furthermore, fishermen who fish mainly in Federal waters may be affected more by a temporary closure of Federal water or substantially by a longer term closure of federal waters. If NMFS implements the in-season AM (i.e., closes Federal waters) without complementary management in territorial waters it is likely that total catch would still exceed the proposed ACL due to the continuation of fishing in and potential displacement of fishing effort into territorial waters. Annual catches for eight of the past 10 years

have exceeded the proposed ACL, and the recent three-year average catch of 27,306 lb exceeds the proposed ACL by 11,007 lb. Therefore, NMFS expects that annual catch would exceed the ACL in subsequent years, resulting in the closure of Federal waters to the fishery after the first year of the rebuilding plan.

If complementary management is implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, participation, or intensity while the fishery remains open compared to the Status Quo. However, the fishery would experience large impacts to operations and associated harvests if bottomfish fishing was prohibited in both Federal and territorial waters (either through the in-season AM being triggered or the higher performance standard being implemented). It is less likely under this scenario that catch would exceed the proposed ACL if a complementary closure is implemented in territorial waters at the same time NMFS implements any necessary in-season AM. This would also reduce the likelihood that NMFS would need to implement the higher performance standard. The implementation of any in-season AM, if triggered, would likely be in August if catches continue as they have in recent years. Regardless if complementary management is implemented or not, catch levels under Alternative 3 would be more constrained than Alternatives 1 or 2. Refer to Section 3.6.1 for additional analysis.

2.5.2 Estimated Conservation and Management Benefit (Alt. 3)

Alternative 3 is expected to prevent overfishing and rebuild the Guam bottomfish stock complex in three years while allowing relatively less harvest to occur than the status quo. The timeframe for rebuilding is ultimately dependent on whether the territory decides to implement complementary management or not. If complementary management is not implemented by the territory, NMFS expects that fishing could continue in and be displaced to territorial waters which may offset any potential conservation benefits of a Federal closure and extend the rebuilding time. If complementary management is implemented and catch does not exceed the ACL for the first three years of the rebuilding plan, the stock could rebuild in that time. Since recent average annual catch is 27,306 lb, it is likely the ACL would be exceeded and Federal waters would close after the first year of the rebuilding plan. With a complete moratorium in both Federal and territorial waters, the fishery could rebuild within two years from the time of the closure. In summary, Alternative 3 would reduce adverse impacts to the Guam bottomfish stock complex from fishing, prevent overfishing, and promote rebuilding in a slightly shorter or equal time frame as Alternative 2. Regardless if complementary management is implemented or not, this alternative would constrain catch and promote rebuilding to a greater extent than Alternatives 1 or 2. Refer to Section 3.5.1 for additional analysis.

2.5.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 3)

Alternative 3 establishes a more conservative ACL and would do less to mitigate cultural, economic, and social effects to the Guam fishing community while rebuilding bottomfish slightly faster than Alternative 2. Relative impacts to the fishing community on Guam would be dependent on whether the territorial government decides to implement complementary management or not.

Without complementary management and while the total catch remains below the ACL, there would be no community impacts. If catches are similar to recent years, then it is likely that if the ACL would be attained during the summer. If the Federal fishery is closed through the in-season AM or the higher performance standard, the impacts would be greater to fishermen who harvest predominately in Federal waters and those community components that rely on fish from Federal waters. However, NMFS expects that operations would also continue to occur in territorial waters if Federal waters are closed to bottomfish fishing, and it is not clear if displacement of fishing effort into territorial waters would mitigate the impact to commercial fishermen or the community. Thus, large cultural, economic, or social impacts are not expected under Alternative 2 if complementary management is not implemented.

If complementary management is implemented, catch would be limited to 27,000 lb, which is the same the status quo. Under this scenario, community impacts would occur if both Federal and territorial waters are closed due to the in-season AM but, since this is not expected to happen until late in the year, the impacts would be minimal. However, if the higher performance standard was applied, catch and revenue would both be reduced to zero and this would likely result in substantial impacts to the Guam fishing community due to both the loss of revenue as well as the lack of availability of locally-sourced bottomfish resources.

In summary, there are would either be minor or substantial impacts expected under Alternative 3 if the fishery continues to operate at average levels, but these impacts would not be present in years where the ACL is not reached. Revenue and availability of bottomfish to the community would be lower under Alternative 3 than under the status quo, regardless if complementary management or the higher performance standard is implemented. The reduction in revenue and fish availability would increase if the higher performance standard is implemented. The greatest reduction would occur if both complementary management and the higher performance standard were implemented. Refer to Section 3.9.1 for additional analysis.

2.6 Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, NMFS would implement a rebuilding plan with an ACL of 31,000 lb for the Guam bottomfish fishery with an in-season AM and higher performance standard to allow for the rebuilding of the Guam bottomfish stock complex. While NMFS would count catches from both Federal and territorial waters towards the ACL, NMFS only has authority to manage the fishery in federal waters and the Territory of Guam may implement management measures in territorial waters to complement federal rebuilding management at its discretion. The development of the ACL in Alternative 4 was based on a previous P*analysis that determined a reduction of 14 percent from the OFL for the ABC, meaning that the Guam bottomfish fishery should be managed at a 36 percent risk of overfishing (WPFMC 2015).

The rebuilding plan would be implemented starting in 2022 until such time that the Guam bottomfish stock complex is determined to be rebuilt (i.e., attained its B_{MSY} as specified in Langseth et al. 2019). This proposed level of catch, if maintained for both territorial and Federal waters, would be able to rebuild the Guam bottomfish stock complex to B_{MSY} in nine years. As an in-season AM, NMFS would close Federal waters around Guam to bottomfish fishing when the agency estimates the fishery would attain the ACL, or immediately if the agency determines

that the fishery has attained or exceeded the ACL. As a higher performance standard for this rebuilding plan, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. This higher performance standard was included to address the possibility that the Guam Government may not implement complementary management with this Federal action to maintain overall catch of the stock below the level of authorized catch, which could delay rebuilding relative to the proposed timeline.

In summary, compared to Alternatives 1, 2, and 3, this alternative represents the application of a less restrictive ACL to allow for more harvest which would cause it to rebuild more slowly. This alternative provides the highest likelihood for the proposed rebuilding timeline to be maintained without imposing additional restrictions to the fishing community. Additionally, the availability of bottomfish resources to Guam fishing communities would be less constrained than under Alternatives 2, 3, and 5. The Council identified Alternative 4 as its preferred alternative at its 186th meeting in June 2021. The potential implementation of complementary management by the Guam Government would not change the expected outcomes under this alternative since expected annual catch is below the ACL. The rebuilding parameters are presented in Table 11.

Table 11. Rebuilding parameters under Alternative 4 as required by NS1 for an overfished fishery.

Parameter	Value
T_{\min}	2 years
T_{target}	9 years
T_{\max}	10 years
F_{rebuild}	0.131 – 0.161

2.6.1 Expected Fishery Outcome (Alt. 4)

Under Alternative 4, the fishery is not expected to change the way it fishes or where it fishes except in years when catch is relatively high (e.g., 2011) when compared to Alternatives 1 - 3 due to the implementation of a relatively higher ACL. The expected outcome under this alternative is not necessarily dependent on the territory’s decision to implement complementary management with this Federal action, though complementary management would be relevant in the event that the ACL is attained. Given the levels of recent catch in the fishery relative to the proposed ACL, there is a lower chance that annual catch would exceed the ACL than under Alternatives 1 - 3, which makes application of the in-season AM and higher performance standard less likely. Annual catches for two of the past 10 years have exceeded the proposed ACL, and the recent three-year average catch of 27,306 lb comprises approximately 88 percent the proposed ACL. However, due to the variability in annual catches of Guam BMUS, it remains possible that the ACL could be exceeded in a year with relatively high fishing activity.

In the event of a Federal closure without complementary management, NMFS expects that fishing would continue in territorial waters. If complementary management is implemented, the fishery would experience large impacts to operations and associated harvests if bottomfish fishing was prohibited in both Federal and territorial waters (either through the in-season AM

being triggered or the higher performance standard being implemented). It is less likely that catch would exceed the proposed ACL if a complementary closure is implemented in territorial waters at the same time NMFS implements any necessary in-season AM. This would also reduce the likelihood that NMFS would need to implement the higher performance standard.

Overall, Alternative 4 provides a Federal action that would aid in rebuilding the Guam fishery, albeit in a longer timeframe than the other Alternatives, while reducing fishery disruptions and allowing a larger amount of bottomfish resources to be available to the Guam fishing community. Similar to Alternatives 2 and 3, fishing cannot necessarily be constrained in territorial waters without complementary management, but this alternative would restrict catches to a lesser extent than either of the previous action alternatives such that there would likely be fewer short-term impacts to Guam's fishing community. The larger ACL would also increase the likelihood that the ACL is not exceeded and that the rebuilding timeframe is maintained. Refer to Section 3.6.1 for additional analysis.

2.6.2 Estimated Conservation and Management Benefit (Alt. 4)

Alternative 4 is expected to prevent overfishing and rebuild Guam bottomfish in nine years while allowing additional harvest to occur than the status quo. Alternative 4 would provide conservation benefits by limiting harvest in years where bottomfish catches would exceed 31,000 lb, but the extent of these benefits is dependent on whether the Guam Government implements complementary management or not. Since only two of the past 10 years have had catches that surpassed this proposed ACL, it is not overly likely that the fishery would attain the ACL if recent fishery performance levels are maintained. If Federal waters are closed through the higher performance standard, territorial waters remain open, and annual catch is above 31,000 lb, then the timeline for rebuilding could be extended due to any displacement of fishing effort from Federal waters to territorial waters. With a complete moratorium in both Federal and territorial waters, the fishery could rebuild within two years from the time of the closure. The ACL under Alternative 4 likely would not achieve rebuilding as fast as Alternatives 2, 3, or 5 but it would promote the rebuilding of the stock complex within the required timeframe. Refer to Section 3.5.1 for additional analysis.

2.6.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 4)

Compared to the previously described action alternatives, Alternative 4 would do more to mitigate cultural, economic, and social effects to the Guam fishing community in the short-term while rebuilding bottomfish by allowing relatively normal access to bottomfish resources through the implementation of a less restrictive ACL. There would only be minor short-term economic impacts expected under Alternative 4 if the fishery operates at a relatively high level and exceeds the ACL in a given year, but there would be negligible impacts to the fishing communities of Guam if the fishery continues harvesting bottomfish at or near the recent average. These impacts may increase in the long-term if the status of the stock is not improved in a reasonable time due to variably high catches. Fishers who primarily harvest bottomfish in the Federal waters are less likely to be impacted than under Alternatives 2, 3 and 5 because the ACL is not as likely to be exceeded, and, therefore, fishermen would not face a short or long-term closure of Federal waters. If the ACL is exceeded, impacts to the fishing community would be dependent on the implementation of complementary management by the territory. Without

complementary management, it is likely that fishing for bottomfish would continue to occur in territorial waters in the event of a closure of Federal waters, which may compensate for some of the short term cultural, economic, and social impacts of a Federal closure. If the higher performance standard was applied with complementary management in territorial waters, then catch and revenue would both be reduced to zero and this would likely result in large cultural, economic, or social impacts to the Guam fishing community. Refer to Section 3.9.1 for additional analysis.

2.7 Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, NMFS would implement a fishing prohibition for and possession of BMUS caught from in Federal waters around Guam. NMFS would implement the rebuilding plan starting in 2022 until such time that the Guam bottomfish stock complex is determined to be rebuilt. This action would be equivalent to implementing a catch limit of 0 lb in Federal waters around Guam and is the action that would address the overfished state of Guam bottomfish in the shortest time possible. The time to rebuild the stock to B_{MSY} in the absence of fishing mortality would be two years. Whether this timeline is maintained is dependent on the territory’s decision to implement complementary management alongside this Federal action. If complementary management were to be implemented by the Territory of Guam, bottomfish catches would be completely restricted in both territorial and Federal waters all year until the measure was rescinded or replaced. There are no AMs associated with this alternative because there would be no need to track catch to against attainment of an ACL, so there would be no in-season monitoring or higher performance standard under Alternative 5. Overall, Alternative 5 would result in less annual catch for the Guam bottomfish fishery than Alternatives 1 through 4 with a similar rebuilding timeframe compared to Alternatives 1, 2, and 4. The rebuilding parameters are presented in Table 12.

Table 12. Rebuilding parameters under Alternative 5 as required by NS1 for an overfished fishery.

Parameter	Value
T_{min}	2 years
T_{target}	2 years
T_{max}	10 years
$F_{rebuild}$	0

2.7.1 Expected Fishery Outcome (Alt. 5)

The Council expects that Alternative 5 would cause large impacts to operations and associated harvests than any of the other alternatives over the course of the rebuilding plan. The extent of the impacts would be dependent on whether the Guam Government implements complementary management or not. Though a closure of Federal waters around Guam to bottomfish fishing would effectively be the same as setting an ACL of 0 lb, in the absence of complementary management, NMFS expects that fishing effort could be displaced to territorial waters where the bottomfish fishery would likely continue operating normally. Therefore, Alternative 5 would result in a moderate reduction in fishing if complementary management is not enacted, but catch would not be completely eliminated (i.e., an ACL of 0 lb achieved). NMFS does not possess data

indicating the level of displacement that could occur. If complementary management is enacted, bottomfish fishing would be restricted in both territorial and Federal waters around Guam, resulting in an annual catch of 0 lb for the duration of the rebuilding plan. Refer to Section 3.6.1 for additional analysis.

2.7.2 Estimated Conservation and Management Benefit (Alt. 5)

Alternative 5 would prevent overfishing of Guam BMUS and the bottomfish fishery would be rebuilt from its overfished state in the shortest possible amount of time by prohibiting all bottomfish catch in Federal waters. However, similar to the other action alternatives, any displacement of fishing effort from Federal waters to territorial waters could offset the conservation benefit in this scenario. If a moratorium is enacted, NMFS anticipates that fishing would continue in territorial waters without a complementary closure of territorial waters which would cause the rebuilding time frame to extend to three years rather than the two years. If complementary management is implemented by the territory, the stock could rebuild in two years. Regardless if complementary management is implemented or not, this alternative would constrain catch and promote rebuilding to a greater extent than all other alternatives. In summary, Alternative 5 would prevent overfishing and support rebuilding stock to the greatest practicable extent possible by NMFS and in the shortest amount of time. Refer to Section 3.5.1 for additional analysis.

2.7.3 Degree to which this Alternative Mitigates Cultural, Economic, and Social Effects of the Management Measure (Alt. 5)

Alternative 5 does not provide for authorized catch in Federal waters. Revenue and availability of bottomfish to the community would be moderately lower or completely reduced relative to the status quo depending on if complementary management is implemented or not. If territorial waters remained open, this would allow for some availability of bottomfish resources to the Guam fishing community for the duration of the rebuilding plan. If fishermen compensated for a closure of Federal waters by displacing their effort into territorial waters, revenue and fish availability could be closer to that expected under the status quo. If complementary management is implemented, there would be substantial impacts to the Guam fishing community due to the lack of bottomfish resources and commercial revenue from the fishery. Overall, implementation of Alternative 5 is expected to affect the fishery and associated communities more than the status quo and other action alternatives. Alternative 5 would pose greater constraints to fishermen for a slight conservation gain, given that the projected time frame to rebuild the stock under a complete closure would be two to three years shorter than Alternative 2. In summary, this alternative does less than all other alternatives to mitigate adverse cultural, economic, and social effects by reducing or eliminating the amount of fish available to markets in Guam.

2.8 Alternatives Considered but Not Analyzed

2.8.1 No Management Action

The Council and NMFS considered a no management action alternative for inclusion in the EA as the baseline against which action alternatives would be compared. Under this alternative, NMFS would neither take action to implement an ACL once the current ACL expires nor would NMFS implement a rebuilding plan with an ACL, AMs, or other associated management measures. In the absence of an ACL, the fishery would not operate under catch limits and AMs

would not be required, but the fishery would continue to be subject to other Federal and territorial management measures such as gear and spatial restrictions. The Council and NMFS would continue to monitor catches through the creel survey expansions, the DAWR commercial reporting system, and other sources of data under a no management alternative. Ultimately, the no management alternative was not analyzed for this action because when the EA was being developed the fishery was subject to a 27,000 lb ACL, taking no management action would not comply with the Magnuson-Stevens Act, and because the fishery outcomes of a no management alternative would be similar to the status quo alternative included for this action (Section 2.3).

2.8.2 Implement an Annual Catch Limit with Territorial and Federal Components

Under this alternative, NMFS would implement an ACL for the Guam bottomfish fishery with separate components for bottomfish catch harvested in both territorial and Federal waters. This would be functionally equivalent to implementing two different ACLs, one for bottomfish catch in territorial waters and one for bottomfish catch in Federal waters. Implementing two ACLs for separate components of the same fishery was determined as not reasonable for this action for several reasons. Given the nature of the creel surveys that would be used to monitor the fishery under this rebuilding plan, there are many uncertainties regarding the reliability of spatially-explicit data derived from those surveys. While area codes for bottomfish catch are included in creel survey interviews, it is not clear if they are accurately reported by fishermen. Additionally, implementation of an ACL with two separate components would be more complicated with respect to tracking each segment of the fishery rather than the fishery as a whole. Further, given that there are doubts that the creel survey data would be sufficient to implement in-season monitoring for the entirety of the fishery during the fishing year, it is likely that there would be greater concerns for engaging in-season monitoring for two separate segments of the same fishery. There may not be a sufficient number of catch interviews for expansion in the middle of the fishing year to be able to generate an estimate of total catch for each segment of the fishery, whereas this issue would be less pronounced when analyzing the entirety of the fishery. Tracking progress towards a separate ACL for the component of the fishery in territorial waters would also be unnecessary, as there would be no meaningful action NMFS could take in the event that the ACL is exceeded to reduce catch in territorial waters without complementary management by the Guam Government. This alternative would also not be in compliance with NS3 of the Magnuson-Stevens Act, which requires that an individual fish stock or stock complex should be managed as a single unit throughout its range.

2.8.3 Implement Federal Permitting and Reporting Alongside Bag Limits

Under this alternative, NMFS would implement annual bag limits for bottomfish fishing in Federal waters in addition to the ACLs and AMs proposed in the action alternatives. NMFS would also implement Federal permitting and reporting to support the monitoring of the bag limits. This alternative was initially presented to and considered by the Council and its SSC at their meetings in November and December 2020 but was not deemed to be appropriate for further analysis for various reasons. The provisions under this alternative would require substantial additional administrative resources and effort relative to all other alternatives to enact the new limitations, establish a permitting scheme, and develop of consistent method of reporting for fishermen. These regulations could also result in additional costs to fishermen to obtain the permit and dedicate time to accurately reporting their catches under the bag limits in Federal waters. Fishermen would also need to learn about the bag limit regulations, comply with the new

laws such that they do not harvest more than the limit that they are individually allocated, and report their catches in Federal waters to NMFS. NMFS would need to dedicate resources to developing a system to distribute permits to fishermen, receive their catch reports, and ensure that fishermen are not exceeding their allocated bag limit. Additional resources would also be required by the National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement (OLE) and U.S. Coast Guard (USCG) to enforce legal fishing in Federal waters under the bag limits (i.e., fishermen would not be allowed to harvest bottomfish in Federal waters without the associated permit and reporting of their catches). The substantial additional costs and effort required under this alternative would likely result in few benefits because of the minor expected reduction in fishing mortality. The low level of benefit relative to the substantial costs for this alternative caused it to be excluded from analysis for this EA.

2.8.4 Implement an Annual Catch Target (ACT) in Addition to an ACL

This alternative would include the implementation of an ACT in addition to the existing ACLs specified in the action alternatives to better prevent the fishery from attaining the ACL in a given fishing year. An ACT, set at some level below the ACL, could be used to buffer the ACL to help ensure that the fishery does not exceed the level of authorized catch. NMFS would close Federal waters around Guam to the bottomfish fishery at such time when NMFS would project the ACT to be attained instead of the ACL. Implementing a Federal closure when the ACT is attained would make it more likely that the fishery would not harvest levels of catch that would exceed the ACL due to continued fishing in territorial waters after the prohibition of bottomfish catches in Federal waters. Ideally, the ACT would be set at a level consistent with a reduction to the implemented ACL based on the amount of uncertainty associated with monitoring the fishery. However, this alternative was not analyzed further given the uncertainty with the data and the lag between data collection and catch estimation.

2.8.5 Implement a Post-Season Accountability Measure

This alternative would employ a post-season AM to augment the implementation of an ACL for the fishery to help ensure that the ACL can result in the rebuilding of the Guam BMUS stock complex. The post-season AM would require an accounting of annual catch (using a three-year running average of recent catch) for the 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. If landings for the three-year running average exceed the specified ACL, the AM would require the Council to take action in accordance with 50 CFR 600.310(g) to correct the operational issue that caused the ACL overage. For the purposes of the post-season AM for this rebuilding plan, this would include a recommendation that NMFS implement a downward adjustment to the ACL in the subsequent fishing year by the amount of overage pursuant to 50 CFR 600.310(g)(3). NMFS would compare a three-year running average of catch to the ACL instead of comparing catch from a single year to apply the overage adjustment to the ACL in accordance with 50 CFR 600.310(g)(5). The Guam bottomfish fishery has highly variable catches and lack reliable annual data on which to base a single-year post-season AM due to the nature of the creel survey program that currently collects data on the fishery.

A post-season AM was not included in the alternatives of this rebuilding plan because it would not be able to address the operational issues that are likely to cause the exceedance of the implemented ACL for the fishery (i.e., continued fishing in territorial waters). Further, because

the recent average catch is higher than each of the ACLs presented in the action alternatives, it is likely that the post-season AM would have to be applied each year of the rebuilding plan and result in an annual reduction of the ACL without tangible conservation benefit.

2.8.6 Implement an Annual Catch Limit of 31,500 lb with an In-Season Accountability Measure and Higher Performance Standard

Under this alternative, the Council would recommend that NMFS implement an ACL of 31,500 lb, which is higher than Alternative 4, alongside an in-season AM to close the fishery when NMFS determines that catch for the fishing year has or will attain or exceed the ACL. BMUS catch from both territorial and federal waters would be tracked against the ACL during the fishing year to determine the need to apply the in-season AM. Additionally, a higher performance standard would be implemented such that, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Compared to the levels of recent catch in the fishery relative to the proposed ACL, there is a lower chance than each of the action alternatives that annual catch would exceed the ACL, which makes application of the in-season AM and higher performance standard less likely.

According to projections generated by the PIFSC SAP (Appendix C), an annual BMUS catch of 31,500 lb is the highest amount of catch possible that would achieve rebuilding within the statutory timeframe of 10 years. The Council ultimately decided against the analysis of an alternative with an ACL of 31,500 lb because it would not be substantially different from Alternative 4 with respect to fishery performance or impacts. Since the addition of an extra 500 lb to the ACL relative to Alternative 4 would add one year to the rebuilding timeline, the Council considered that the extra allowable catch would not be worthwhile accounting for the tradeoff of elongating the rebuilding process. Additionally, given the uncertainty with the data, implementing an even higher ACL than described under Alternative 4 would further increase the risk of overfishing for the Guam bottomfish fishery, which could threaten the action's consistency with Section 304(e)(3) of the Magnuson-Stevens Act that states overfishing must be prevented for overfished fisheries.

2.9 Comparison of Features of the Alternatives

Table 13 presents a summary of various features of the alternatives to allow for comparison among the alternatives.

Table 13. Comparison of the proposed fishery management features and expected outcomes for this action.

Topic	Alt. 1 – Status Quo	Alt. 2 – ACL of 27,000 lb	Alt. 3 – ACL of 16,299 lb	Alt. 4 – ACL of 31,000 lb	Alt. 5 – Temporary Moratorium
Also referred to as:	Baseline.	Alt. 2.	Alt. 3.	Alt. 4, the Preferred Alternative.	Alt. 5.
Active fisheries affected	Guam bottomfish.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
Active fisheries indirectly affected	Guam troll, CNMI bottomfish.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
Complies with Magnuson-Stevens Act	No.	Yes.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
Accountability Measures	In-season: N/A. Post-season: At the end of fishing year, if the three-year running average catch exceeds the ACL, NMFS would reduce the ACL for the following year but the amount of overage.	In-season: If NMFS projects ACL would be exceeded, NMFS would close Federal fishery. Higher performance standard: if ACL is exceeded, NMFS would close fishery in Federal waters until coordinated management approach is developed and regulations are implemented that ensures catch in Federal and territorial waters can be maintained at levels to rebuild stock	Same as Alt. 2.	Same as Alt. 2.	No AM implemented, as there would be no ACL to track catch towards.
Monitored by:	Guam DAWR Creel Surveys.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
Time to rebuild w/no complementary	5 years.	3 to 5 years.	3 to 4 years.	3 to 9 years.	3 years.

Topic	Alt. 1 – Status Quo	Alt. 2 – ACL of 27,000 lb	Alt. 3 – ACL of 16,299 lb	Alt. 4 – ACL of 31,000 lb	Alt. 5 – Temporary Moratorium
management (see Section 3.5.1 for more information)					
ACL likely to be exceeded in a given year (based on recent average catch) (Section 3.6.1)	Yes, the recent average catch is approximately 101% of the ACL.	Same as Alt. 1.	Yes, the recent average catch is approximately 167% of the ACL.	No, the ACL is 13.5% greater than recent average catch.	N/A.
Complementary closure of territorial waters by Guam Government	N/A.	Unknown.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.
Possibility of fishery closure in Federal waters (Section 3.6.)	None.	Possible by late December in 2022 and for the full year in subsequent years.	Possible by August in 2022 and for the full year in subsequent years.	Approx. 30% chance based on catch values from the past 10 years.	100%. Full year.
Expected annual catch of Guam BMUS (Section 3.6.1)	27,306 lb.	<i>With complementary management:</i> 27,000 lb in 2022 if the fishery remains below the ACL, but 0 lb in subsequent years if it exceeds the ACL. <i>W/out comp. management:</i> up to 27,225 lb in 2022 and up to 20,097 lb in subsequent years.	<i>With complementary management:</i> 16,299 lb in 2022 and 0 lb in subsequent years. And annually, if fishery does not exceed ACL. If it does, then 0 lb in subsequent years. <i>W/out comp. management:</i> up to 24,400 lb in 2022 and up to 20,097 lb in subsequent years.	<i>With complementary management:</i> 27,306 lb each year, if the fishery does not exceed the ACL, and 0 lb if it exceeds the ACL. <i>W/out comp. management:</i> up to 27,306 lb.	<i>With complementary management:</i> 0 lb. <i>W/out comp. management:</i> up to 20,097 lb.
Mitigates effects to fishing communities during time frame of	Yes. NMFS would not restrict fishing in the fishery and	Yes. More than Alt. 3 and 4 but less than Alt. 1, as NMFS would expect	Yes. More than Alt. 5 but less than the other alternatives. Alt. 3	Yes. More than any of the other action alternatives because	In the short term, no, not relative to other action alternatives,

Topic	Alt. 1 – Status Quo	Alt. 2 – ACL of 27,000 lb	Alt. 3 – ACL of 16,299 lb	Alt. 4 – ACL of 31,000 lb	Alt. 5 – Temporary Moratorium
rebuilding plan <i>(Section 3.9.1)</i>	<p>catch would be the same as in previous years.</p> <p>This alternative lacks long-term benefits of restricting harvest in years of high catch to ensure the rebuilding time frame that the action alternatives would provide.</p>	<p>less fishing than under Alt. 1 but more than under Alt. 3 and 4 during rebuilding.</p> <p>The implementation of an ACL slightly less than recent average would help to mitigate impacts on Guam fishing communities that depend on fishing in Federal waters for locally harvested bottomfish relative some of the other action alternatives.</p> <p>Long-term, there would likely be additional benefit to rebuilding the stock than under Alt. 1, which could improve the future outlook of the fishery.</p>	<p>represents the strictest amount of catch allowed in Federal waters among the action alternatives. The conservative ACL would do less than Alt. 2 to ensure bottomfish resources are available to the Guam fishing community.</p> <p>Long-term, there would be additional benefit to rebuilding the stock more quickly than Alt. 2, which may improve the future outlook of the fishery.</p>	<p>of the relatively higher ACL to be implemented. The more relaxed ACL would do more than each of the other action alternatives to ensure that bottomfish resources are available to the Guam fishing community.</p> <p>Long-term, there may be reduced benefit in taking additional time to rebuild the overfished bottomfish stock (longer than any other action alternative).</p>	<p>since a closure of Federal waters would be the most restrictive action that the Council could recommend in implementing a rebuilding plan for the fishery.</p> <p>Long-term, there would likely be additional benefit to rebuilding the stock more quickly than under Alt. 1, 2, and 3, which may improve the future outlook of the fishery.</p>

3 AFFECTED ENVIRONMENT AND POTENTIAL EFFECTS OF THE ALTERNATIVES

This section describes the fishery and associated ecosystem resources, the fishery, fishery participants, the fishing communities, and the potential effects of the proposed action.

3.1 Overview of Guam

Guam is the southernmost island of the Mariana Archipelago located in the western Pacific Ocean, and is an unincorporated, organized territory of the United States. It is relatively small in both land area (549 km²) and EEZ area (221,504 km²). Combined, all the other islands in the Mariana Archipelago have a population of 57,559. In contrast, Guam has a population of 169,630. Dededo Village is the most populous village on the island, inhabited by over 26 percent of the total population of Guam. The island itself is characterized by steep topography, protected bays, and extensive coral reefs accompanied by several offshore banks. Guam has a substantial economic influence from the large-scale presence of the U.S. military, though Guam's economy has become more heavily affected by tourism from Asian countries in recent years (WPFMC 2009).

3.2 Overview of Bottomfish Biology and Distribution

Very little biological information is known about the bottomfish stock complex in Guam. The bottomfish fishery in Guam primarily harvests 13 species that include emperors, snappers, groupers, and jacks (Table 1). All species have a wide Indo-Pacific distribution and their range generally extends east to Hawaii, north to Japan, south to Australia, and, for some, as far west as East Africa. Most species prefer rocky bottom substrates or rocky reefs; however, in Hawaii the blueline snapper (*Lutjanus kasmira*) prefers schooling on sandy substrates in the juvenile stage while adults are more solitary and inhabit deep reefs. The majority of the stock complex can be found at depths between 10 and 350 m (33 and 1,150 ft), but some species, such as the red snapper (*Etelis carbunculus*) and pink snapper (*Pristipomoides sieboldii*) can occur at depths up to 400 and 500 m, respectively (1,310 and 1,640 ft). As shown in Figure 1, the best information currently available shows that the majority of bottomfish habitat around Guam is in territorial waters (73.6 percent), and the rest is in the Federal waters located on and around offshore banks both to the northeast and southwest of Guam (26.4 percent). All species in the complex are predatory fish and feed on fish, squid, molluscs, crustaceans, and zooplankton.

Spawning has been recorded nearly year-round for most species, but is more common in warmer months and with peak activity occurring in some species around November and December. Spawning aggregations have been reported in the giant trevally (*Caranx ignobilis*), red snapper (*Etelis carbunculus*), and lunartail grouper (*Variola louti*). While most groupers are protogynous hermaphrodites (i.e., animals that are born female and at some point in their lifespan change sex to male), it has yet to be confirmed in the lunartail grouper. Sexual maturity and life span varies greatly among the stock complex. *Pristipomoides sieboldii* reaches sexual maturity at three years old and has a lifespan of not more than eight years. In contrast, *Pristipomoides filamentosus* is a slow growing long lived species, with the oldest fish recorded at 44 years old.

3.3 Overview of the Bottomfish Fishery

Though indigenous peoples of Guam are known to have been highly skilled fishermen throughout their history, the bottomfish fishery as it currently exists was developed in the late 1980s (Allen and Bartram 2008). There are two distinct sectors of the Guam bottomfish fishery that can be identified by both depth fished and species targeted: the shallow water component and the deep water component. The shallow water component (i.e., those fishing at depths of less than 500 ft) has historically comprised the largest portion of total bottomfish catch and effort due to lower associated expenses and relative ease of fishing close to shore. In recent years, the deep water component (i.e., those fishing at depths of > 500 ft) has made up a notable portion of the total expanded bottomfish catch (WPFMC 2020). Smaller fishing vessels (i.e., < 25 ft in length), which comprise a majority of the Guam bottom fishing fleet, tend to target shallow-water bottomfish species for recreational, subsistence, and small-scale commercial purposes, while the few relatively large vessels in the fishery (i.e., > 25 ft in length) target the deep water bottomfish complex at offshore banks (e.g., Galvez, Santa Rosa, and Rota Banks) and primarily fish for commercial reasons (WPFMC 2009; Langseth et al. 2019); however, some recreational vessels less than 25 ft in length have also been known to target deep water bottomfish at the offshore banks and other offshore areas where bottomfish habitat occurs (Langseth et al. 2019).

Bottomfish fishing around Guam typically occurs using vertical lines with electric or spin-casting reels depending on the fishing depth being targeted (Langseth et al. 2019). Shallow water fishermen, harvesting at depths of 100 to 500 ft, typically use two to four spinning reels with several size 8/0 circle hooks and a weighted fishing line (NMFS 2015). Commercial fishermen fishing in deep water generally operate between two and six electric reels with a 6-lb weight on the end. The long vertical main line has several 1.5 ft branch lines with hooks attached at 1.5 to 3 ft intervals above the weight, although this configuration may vary. Fishermen may also suspend a light or chum bag with chopped squid or fish as bait above the highest hook (NMFS 2015; Allen and Bartram 2008). It is not uncommon for fishermen to combine bottomfish fishing with other methods of harvest such as trolling, spearing, and jigging, to maximize their catch (WPFMC 2021).

Guam's bottomfish fishery is highly seasonal, with fishing effort notably increasing during the summer months when weather and sea conditions are relatively calm. During these periods of favorable conditions, bottomfish fishing tends to increase on the offshore banks in Federal waters as well as on the east side of the island in territorial waters (WPFMC 2009). It is likely that some fishing vessels that harvest bottomfish on the offshore banks around Guam land their catches in the CNMI (WPFMC 2002). However, it is prohibited for Guam bottomfish vessels to commercially harvest bottomfish in the CNMI management subarea, which is the EEZ seaward of CNMI territorial waters, without a valid CNMI commercial bottomfish permit (50 CFR 665.404(a)(2) and 665.405(e)).

The 2021 LOF estimated that there are more than 300 participants in the Guam bottomfish fishery (86 FR 3028, January 14, 2021). Since 2001, the boat-based segment of the fishery landed between 11,711 and 54,062 lb of BMUS annually (Table 4). In 2017 and 2018, approximately 25 and 10 percent of that catch has been commercially sold, respectively (Table 7; see Section 3.4.1). Participants in the shallow water component of the fishery, which comprises a large portion of the fishery, rarely sell their catch and fish instead for recreational or subsistence

purposes, so the fishery is primarily non-commercial (WPFMC 2009). Though bottomfish fishing has only accounted for 10 to 15 percent of Guam’s long-term boat-based fisheries harvest, bottomfish hold fundamental dietary and cultural importance for the people of Guam (Allen and Bartram 2008). Fishing grounds in Federal waters around Guam remain important for the harvest of deep water snappers at offshore banks to provide locally sourced bottomfish the island’s inhabitants, and the extensive community networks for sharing locally caught fish suggest that it is likely that the social benefits of fishing are widely shared by many of Guam’s long-term residents (WPFMC 2009).

3.4 Overview of Fishery Management and Fishery Data Collection in Guam

The Council and NMFS manage the BMUS fishery in Federal waters (i.e., the EEZ, 3-200 miles from shore) around Guam in accordance with the FEP for the Mariana Archipelago, the Magnuson-Stevens Act, and implementing regulations at 50 CFR 665. Federal regulations prohibit bottom trawls, bottom gillnets, explosives, and poisons (50 CFR 665.406). Territorial regulations also prohibit the use of explosives, poisons, and electrical devices (5 Guam Code Annotated (GCA) § 63104 through 63110). Additionally, large vessels (> 50 ft in length) may not fish for bottomfish in the Guam large vessel bottomfish prohibited area (50 CFR 665.403(a)) and must obtain a permit to fish in the remainder of Guam territorial waters (50 CFR 665.402 and 665.404(a)).

The Territory of Guam manages the BMUS fishery in territorial waters (i.e., generally 0 to 3 nm from shore) and has discretion to implement management in its waters, including measures that compliment fishery management in Federal waters. The management structure of Mariana Archipelago FEP emphasizes community participation and increased consideration of the surrounding habitat and ecosystem during management decision making. A joint Federal-territorial partnership enforces Federal fishery regulations, and the Mariana Archipelago FEP requires the Council to produce an annual performance report for the fishery (e.g., WPFMC 2021).

The Guam bottomfish fishery is monitored using data voluntarily provided by fishermen to DAWR through the boat-based and shore-based creel survey programs. Additionally, DAWR receives voluntary commercial sales data from the commercial receipt book program. The Sportfish Restoration Grant from the U.S. Fish and Wildlife Service (USFWS) provides a large portion of the funding for these data collection programs in Guam.

3.4.1 Boat-Based Creel Survey Program

The boat-based creel survey program is a long-term program that collects information from fishermen on catch, effort, and participation for offshore fishing activities conducted by commercial and non-commercial fishing vessels. A detailed description of the boat-based creel survey program on Guam is available in Jasper et al. (2016). The boat-based creel surveys are comprised of two survey methods, a roving survey, and an access point survey. Access point surveys are conducted at Agana Boat Basina, Agat Marina, and Merizo Pier and focus on fishermen interviews, while the roving surveys collect participation data. Participation counts are done by recording the number of boats departing or returning from the assigned port during a survey shift and noting the gear type used. The fishermen interviews document catch rates per trip, gear type, species composition, and length/weight measurements of the catch. Survey days

are split evenly between weekdays and weekends eight days per month, with both morning and late-afternoon shift. The creel survey data are transcribed into the NMFS WPacFIN database where catch expansion algorithms are applied to the data to generate annual estimates of total boat-based landings.

3.4.2 Shore-Based Creel Survey Program

The shore-based creel survey program is a long-term program that collects information from fishermen on catch, effort, and participation for inshore fishing activities. A detailed description of the shore-based creel survey program on Guam is available in Jasper et al. (2016). Roving survey methods are used to sample inshore fishing using land-based and aerial surveys. The land-based surveys are comprised of both participation counts and fishermen interviews. Participation counts are done by driving along the shoreline of a designate region in search of fishermen with data collectors recording fishing effort by gear type. The fishermen interviews document catch rates of shore-based fishermen. The aerial survey is used to help estimate fishing activity across the whole island of Guam, including in areas that are inaccessible by road. There are four island-wide sample days per month, with two sample days occurring during the week and two sample days occurring on weekends. On each sample day there is a morning and evening shift, during which pre-defined coastal routes are traversed until the route has been completed. Survey dates are randomly selected two to four times per week and the surveys take place over eight-hour periods. The creel survey data are transcribed into the NMFS WPacFIN database where catch expansion algorithms are applied to the data to generate annual estimates of shore-based landings.

3.4.3 Commercial Receipt Book Program

The commercial receipt book program monitors fish sold locally in Guam and collects information from dealers and/or vendors who purchase fish directly from fishermen. Commercial reports are typically collected monthly and are tallied at the end of the year after being adjusted based on coverage estimates provided by the vendors, dealers, and/or DAWR. However, data reporting for the program is not mandatory in Guam, and there have frequently been fewer than three dealers providing information on an annual basis.

3.4.4 Overview of Federal Permit and Reporting Requirements

There are no Federal permit or reporting requirements for bottomfish fishing in Federal waters around Guam except for large vessels (> 50 ft), which must report their catch and are also prohibited from fishing or anchoring within 50 nm around Guam. Bottomfish fishermen in Guam are not otherwise required to report their BMUS catch to NMFS.

3.4.5 Overview of Territorial Permit and Reporting Requirements

There are currently no required territorial permitting or reporting requirements for bottomfish fishing in territorial waters around Guam.

3.5 Target, Non-Target, and Bycatch Species and Potential Effects of The Alternatives

BMUS are typically monitored at the complex level, and the 2019 stock assessment (Langseth et al. 2019) provides stock status and biomass projections at this level. Therefore, NMFS would apply the proposed rebuilding plan under the action alternatives to the Guam bottomfish stock

complex as a whole rather than to the 13 individual species comprising the group. The primary sources of information on target, non-target, and bycatch species associated with Guam bottomfish are NMFS stock assessments by Brodziak et al. (2012), Yau et al. (2016), and Langseth et al. (2019) as well as data provided by NMFS and summarized in the Council's annual SAFE report (e.g., WPFMC 2021).

The 2019 stock assessment estimated the long-term MSY for the bottomfish stock complex to be 42,100 lb and the six-year OFL proxy at 36,000 lb for 2020 to 2025. The assessment also concluded that the Guam bottomfish stock complex is overfished but not experiencing overfishing (Section 2.1.1). Between 2018 and 2020, the fishery harvested an average of 27,306 lb (Table 4), which is approximately 65 percent of the MSY and 76 percent of the OFL from the 2019 stock assessment. The following section analyzes if the Alternatives will rebuild the Guam bottomfish stock complex from its overfished designation, based on the best scientific, commercial, and other information available about the fishery when compared to the Status Quo.

The Magnuson-Stevens Act defines bycatch as finfish, mollusks, crustaceans, and all other forms of marine animal and plant life (other than marine mammals and seabirds) that are harvested in a fishery that are not sold or kept for personal use. Bycatch can be further described as either economic or regulatory discards. Economic discards are fish that are discarded because they are of undesirable size, sex, or quality, while regulatory discards are fish that are discarded because regulations do not allow fishermen to retain the fish. Since almost all fishes caught in Guam are considered food fishes, the few discards that occur may be due to regulatory requirements or economic discards that result from shark depredation. Data on bycatch harvested in the Guam bottomfish fishery is collected through the boat-based and shore-based creel survey programs run by DAWR and is reported by the Council in its annual SAFE reports. Bottomfish fishing is target-specific. There were no BMUS reported as being released by the Guam bottomfish fishery in 2020, and 16 non-BMUS individuals were discarded or released in the boat-based fishery (i.e., not exclusive to bottomfish) for a total bycatch rate of 1.97 percent (see Table 33 in WPFMC 2021). Thus, there is no current concern regarding effects of the bottomfish fishery on non-target or bycatch species.

3.5.1 Potential Effects of the Alternatives on Bottomfish Stock Complex

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would implement an ACL of 27,000 lb with a post-season AM to correct overages. This level of catch is expected to prevent overfishing while rebuilding the Guam bottomfish fishery in five years. The recent average catch from 2018 – 2020 is 27,306 lb so it is possible that the fishery could come close to or exceed the authorized level of catch. Catches increased in 2018 and 2019 but this could be due to inherent variability in the fishery.

As a post-season AM, the Council and NMFS would conduct a post-season accounting of the annual catch for a stock complex (using the territorial specific boat-based creel survey) 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. If the three-year average of catch exceeds the specified ACL, the AM requires NMFS to implement a downward adjustment in the amount of the overage to the ACL in the subsequent fishing year, or other measures, as appropriate. If catches occur at levels higher than the recent average, the implementation of a

post-season AM will help to minimize the impact to the stock by possibly reducing catch in the subsequent year. The use of the three-year average of catch as a benchmark against the ACL is appropriate given the data limitations and uncertainty. However, the use of the three-year average of catch also means that large overages in any one year may not be mitigated. The stock contains both slow growing, long lived species and faster growing, shorter lived species and a catch significantly higher than the ACL in any one year could negatively impact the success of rebuilding. For example, it is common in slow growing, long lived species that older and larger females in the population are more reproductively successful (e.g., in terms of eggs produced, quality of eggs, duration of spawning, etc.; Hixon et al 2014). If a year of high catch results in the harvest of a higher proportion of large females from these populations, then it could reduce the effectiveness of the rebuilding plan by removing those individuals that would contribute the most to rebuilding. Additionally, since these populations are slow growing, it would take some time for smaller females to replace larger females and make up for the lost reproduction potential. However, the impact could be mitigated since NMFS is required to review the progress of the rebuilding plan every two years and take action if adequate progress is not being made.

Annual catches under Alternative 1 are expected to be consistent with the recent three-year average of 27,306 lb regardless of the implementation of complementary management. While the stock complex may be able to rebuild at this level of catch in five years, there would be no management in place to restrict catch if it exceeds sustainable levels of harvest specified in the stock assessment (Langseth et al. 2019). The lack of an in-season AM under Alternative 1 would not prevent overfishing or ensure rebuilding in years of high catch, so this alternative is not consistent with the purpose and need of this proposed action.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, NMFS would implement a rebuilding plan with an ACL of 27,000 lb which is expected to prevent overfishing while rebuilding Guam bottomfish in five years. This alternative would implement an in-season AM in contrast to Alternative 1, which would only implement a post-season AM. Under the in-season AM, NMFS would monitor the fishery in both Federal and territorial waters and if the ACL was projected to be reached, NMFS would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. As a higher performance standard, if the ACL is exceeded in any year of the rebuilding plan, Federal waters would be closed until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild.

The recent average catch from 2018 – 2020 is 27,306 lb so it is possible that the fishery could exceed the authorized level of catch. Catches increased in 2018 and 2019 but this could be due to inherent variability in the fishery. The implementation of the in-season AM, if triggered, would likely be late in the fishing year if catches continue as they have in recent years. Since spawning occurs nearly year-round for most species in the complex, a closure later in the year is not expected to have an impact on spawning compared to other times of the year.

If Federal waters are closed to fishing, in the absence of a complementary closure in territorial waters, NMFS expects that there would be displacement of fishing effort to territorial waters where the majority of bottomfish habitat around Guam is situated. It is possible that not all fishing effort would be displaced as those fishermen who prefer to fish in Federal waters (i.e., on the offshore banks, see Fig. 1) for deepwater species may choose not to fish in territorial waters for shallow water bottomfish species. Therefore, there may be beneficial effects for fish populations at offshore banks in Federal waters if a Federal closure is implemented, relative to the status quo alternative, even though bottomfish harvested in territorial waters would continue experiencing consistent fishing effort if a complementary closure is not implemented. While any displacement of fishing effort could delay the proposed rebuilding timeline, the application of the in-season AM or the higher performance standard under this alternative, if triggered, would still promote rebuilding, albeit possibly on a longer timeframe. If a closure of Federal waters occurred through the higher performance standard, territorial waters did not close, and catches continue to be similar to recent annual three year average, the fishery could rebuild from its overfished state in approximately five years or less due to reductions in catch from in-season AM and performance.

If Federal waters were closed through the higher performance standard and complementary management is implemented, catch would be constrained to a greater extent than if a complementary closure was not implemented. Under this scenario, the beneficial effects would occur for both shallow water species in territorial waters and deepwater species at offshore banks in Federal waters. With a complete moratorium in both Federal and territorial waters, the fishery could rebuild within two years from the time of the closure.

Regardless if complementary management is implemented or not, this alternative would constrain catch and promote rebuilding to a greater extent than the status quo alternative due to the application of the in-season AM. In summary, NMFS expects Alternative 2 to rebuild the Guam bottomfish fishery in five years and this alternative would provide more potential conservation benefits than the status quo.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under this alternative, NMFS would implement a rebuilding plan with an ACL of 16,299 lb which is expected to prevent overfishing while rebuilding Guam bottomfish in three years. This alternative would implement an in-season AM in contrast to Alternative 1, which would only implement a post-season AM. Under the in-season AM, NMFS would monitor the fishery in both Federal and territorial waters and if the ACL was projected to be reached, NMFS would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. As a higher performance standard, if the ACL is exceeded in any year of the rebuilding plan, Federal waters would be closed until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild.

The recent average catch from 2018 – 2020 is 27,306 lb. NMFS expects that, if catches continue to be similar to recent annual three year average and fishing effort is consistent throughout the

year, the in-season AM could be triggered and the fishery could be closed during the summer months. Spawning occurs nearly year-round for most species in the complex. Therefore, a closure of Federal waters during the second half of the year would provide some benefit to the bottomfish populations found in Federal waters due to additional spawning opportunities when compared to those populations found in territorial waters.

If Federal waters are closed to fishing, in the absence of a complementary closure in territorial waters, NMFS expects that there would be displacement of fishing effort to territorial waters where the majority of bottomfish habitat around Guam is situated. It is possible that not all fishing effort would be displaced as those fishermen who prefer to fish in Federal waters (i.e., on the offshore banks, see Fig. 1) for deepwater species may choose not to fish in territorial waters for shallow water bottomfish species. Therefore, there may be beneficial effects for fish populations at offshore banks in Federal waters if a Federal closure is implemented, relative to the status quo alternative, even though bottomfish harvested in territorial waters would continue experiencing consistent fishing effort if a complementary closure is not implemented. While any displacement of fishing effort could delay the proposed rebuilding timeline, the application of the in-season AM or the higher performance standard under this alternative, if triggered, would still promote rebuilding, albeit possibly on a longer timeframe. If a closure of Federal waters occurred through the higher performance standard, territorial waters did not close, and catches continue to be similar to recent annual three year average, the fishery could rebuild from its overfished state in approximately five years.

If Federal waters are closed through the higher performance standard and complementary management is implemented, catch would be constrained to a greater extent than if a complementary closure was not implemented. Under this scenario, the beneficial effects would occur for both shallow water species in territorial waters and deepwater species at offshore banks in Federal waters. With a complete moratorium in both Federal and territorial waters, the fishery could rebuild within two years from the time of the closure.

Regardless if complementary management is implemented or not, this alternative would constrain catch and promote rebuilding to a greater extent than the status quo alternative due to the application of the in-season AM. In summary, NMFS expects Alternative 2 to rebuild Guam bottomfish in three years and this alternative has additional conservation benefit relative to the status quo, Alternative 2, and Alternative 4.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, NMFS would implement a rebuilding plan with an ACL of 31,000 lb which is expected to prevent overfishing while rebuilding Guam bottomfish in nine years. This alternative would implement an in-season AM in contrast to Alternative 1, which would only implement a post-season AM. Under the in-season AM, NMFS would monitor the fishery in both Federal and territorial waters and if the ACL was projected to be reached, NMFS would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. As a higher performance standard, if the ACL is exceeded in any year of the rebuilding plan, Federal waters would be closed until a coordinated management approach is developed and

regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild.

The recent average catch from 2018 – 2020 is 27,306 lb. Based on recent annual catch levels, it is less likely that the fishery would exceed proposed ACL; however, the ACL being reached is possible given that catch for three out of the past 10 years have exceeded the proposed ACL. The implementation of the in-season AM, if triggered, would likely be late in the fishing year if catches continue as they have in recent years. Since spawning occurs nearly year-round for most species in the complex, a closure later in the year is not expected to have an impact on spawning compared to other times of the year.

If Federal waters are closed to fishing, in the absence of a complementary closure in territorial waters, NMFS expects that there would be displacement of fishing effort to territorial waters where the majority of bottomfish habitat around Guam is situated. It is possible that not all fishing effort would be displaced as those fishermen who prefer to fish in Federal waters (i.e., on the offshore banks, see Fig. 1) for deepwater species may choose not to fish in territorial waters for shallow water bottomfish species. Therefore, there may be beneficial effects for fish populations at offshore banks in Federal waters if a Federal closure is implemented, relative to the status quo alternative, even though bottomfish harvested in territorial waters would continue experiencing consistent fishing effort if a complementary closure is not implemented. While any displacement of fishing effort could delay the proposed rebuilding timeline, the application of the in-season AM or the higher performance standard under this alternative, if triggered, would still promote rebuilding, albeit possibly on a longer timeframe. However, if catches continue to be similar the recent annual average, the fishery would be allowed to rebuild from its overfished state in a shorter amount of time (i.e., five years) and no closure of Federal waters would need to be implemented.

If Federal waters were closed through the in-season AM and complementary management is implemented, catches would be restricted to 31,000 lb in both territorial and Federal waters. Thus, Alternative 4 would reduce expected catch in years with relatively high catch relative to the status quo and would do more to support rebuilding of the stock complex from its overfished designation. If Federal waters were closed through the higher performance standard and complementary closure is implemented, catch would be constrained to a greater extent than if a complementary closure was not implemented. Under this scenario, the beneficial effects would occur for both shallow water species in territorial waters and deepwater species at offshore banks in Federal waters. With a complete moratorium in both Federal and territorial waters, the stock complex could rebuild within two years from the time of the closure.

Regardless if complementary management is implemented or not, this alternative would constrain catch and promote rebuilding to a greater extent than the status quo alternative, even though the rebuilding timeline is longer, due to the application of the in-season AM. In summary, NMFS expects Alternative 4 to rebuild Guam bottomfish in nine years and this alternative would provide more potential conservation benefits than the status quo.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, NMFS would implement a closure of Federal waters to bottomfish fishing. If complementary management is implemented and there is a complete moratorium in both Federal and territorial waters, the complex could rebuild within two years from the time of the closure. In the absence of complementary management in territorial waters, NMFS expects that there would be displacement of fishing effort to territorial waters where the majority of bottomfish habitat around Guam is situated. It is possible that not all fishing effort would be displaced as those fishermen who prefer to fish in Federal waters (i.e., on the offshore banks, see Fig. 1) for deepwater species may choose not to fish in territorial waters for shallow water bottomfish species. Therefore, there may be beneficial effects for fish populations at offshore banks in Federal waters if a Federal closure is implemented, relative to the status quo alternative, even though bottomfish harvested in territorial waters would continue experiencing consistent fishing effort if a complementary closure is not implemented. If Federal waters were closed and complementary closure is implemented, the beneficial effects would occur for both shallow water species in territorial waters and deepwater species at offshore banks in Federal waters.

Regardless if complementary management is implemented or not, this alternative would constrain catch and promote rebuilding to a greater extent than the status quo alternative. In summary, Alternative 5 would provide a greater conservation benefit than all other alternatives and rebuild the stock complex in the shortest time possible.

3.6 Guam Bottomfish Fishery and Potential Effects of the Alternatives

There are two distinct sectors of the Guam bottomfish fishery that can be identified by both depth fished and species targeted: the shallow water component and the deep water component. The shallow water component (i.e., those fishing at depths of less than 500 ft) has historically comprised the largest portion of total bottomfish catch and effort due to lower associated expenses and relative ease of fishing close to shore. In recent years, the deep water component (i.e., those fishing at depths of > 500 ft) has made up a notable portion of the total expanded bottomfish catch (WPFMC 2020). Smaller fishing vessels (i.e., < 25 ft in length), which comprise a majority of the Guam bottom fishing fleet, tend to target shallow-water bottomfish species for recreational, subsistence, and small-scale commercial purposes, while the few relatively large vessels in the fishery (i.e., > 25 ft in length) target the deep water bottomfish complex at offshore banks (e.g., Galvez, Santa Rosa, and Rota Banks) and primarily fish for commercial reasons (WPFMC 2009; Langseth et al. 2019); however, some recreational vessels less than 25 ft in length have also been known to target deep water bottomfish at the offshore banks and other offshore areas where bottomfish habitat occurs (Langseth et al. 2019). It is not uncommon for fishermen to combine bottomfish fishing with other methods of harvest such as trolling, spearing, and jigging, to maximize their catch (WPFMC 2021).

The 2021 LOF estimated that there are more than 300 participants in the Guam bottomfish fishery (86 FR 3028, January 14, 2021). Since 2000, catch has varied from nearly 12,000 pounds (lb) to just under 65,000 lb (Table 2). The high variability observed in catches is likely due to high liners (i.e., commercial fishermen who are highly motivated and skilled) entering and exiting the fishery (Allen and Bartram 2008). Guam's bottomfish fishery is also highly seasonal, with fishing effort notably increasing during the summer months when weather and sea

conditions are relatively calm. During these periods of favorable conditions, bottomfish fishing tends to increase on the offshore banks in Federal waters as well as on the east side of the island in territorial waters (WPFMC 2009).

Since ACLs were first implemented in 2012, catches for the fishery have been consistently below the implemented ACLs (Table 6). The lowest estimated catch of bottomfish in Guam was in 2015 at 11,711 lb. In more recent years, catches increased in 2018 and 2019 when no ACLs were implemented (31,226 lb and 31,760 lb respectively), but this could be due to inherent variability in the fishery. As shown in Figure 1, the best information currently available shows that the majority of bottomfish habitat is in territorial waters (73.6 percent), and the rest is in the Federal waters located on and around offshore banks both to the northeast and southwest of Guam (26.4 percent). Due to current data limitations, it is not possible to know how much of the catch is harvested in Federal waters and how much catch is harvested from territorial waters or to estimate catch of individual species. Therefore, the amount of habitat is used as a proxy for estimating the amount of catch harvested in Federal and territorial waters. Due to data limitations, NMFS is unable to track the catch in real-time and there will be a lag between the actual harvest of bottomfish (as collected through the intercept survey administered by DAWR, see Section 3.4) and NMFS' ability to estimate the catch of several days to several weeks or longer, depending on the time of year. Additionally, the current data limitations increase the uncertainty in the catch estimate during the first half of the fishing year. The catch estimate becomes more reliable as additional interviews are conducted via the survey program (Section 3.4). The following section analyzes the effects of the alternatives on fishery catch.

3.6.1 Potential Effect of the Alternatives on the Bottomfish Fishery in Guam

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would implement an ACL of 27,000 lb with no in-season AM to prevent the ACL from being exceeded but with a post-season AM to correct overages. This would mirror the last management action taken for the fishery (86 FR 32361, June 21, 2021). Because recent average catch values for the Guam bottomfish fishery have not approached the ACLs previously specified for the fishery and no in-season AMs were previously implemented, the previous ACLs did not functionally constrain the fishery. NMFS would monitor catch in both territorial and Federal waters and use that when assessing catch against the ACL. Whether similar management would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary measures or not.

The recent average catch from 2018 – 2020 is 27,306 lb, so the proposed ACL is slightly lower than the recent three-year catch. It is not clear how often annual catches would exceed the ACL if catches are similar to the recent years (Table 4), as annual catch from five of the past 10 years have exceeded the proposed ACL. However, if catches remain similar to the recent three-year average, and because of the high catches in 2018 and 2019, it is possible that catch could exceed the most recent three-year average and the post-season AM would be applied.

Post-season AMs were utilized in previous fishing years, but the three-year average of catch never reached or exceeded the implemented ACL so the post-season AM was not triggered. Therefore, the lack of an in-season AM under Alternative 1 is not expected to result in any change to the fishery with respect to fishing gear, effort, participation, intensity, or areas fished,

and catches are expected to be similar to those in recent years. Annual catches under Alternative 1 are expected to be consistent with the recent three-year average of 27,306 lb regardless of the implementation of complementary management in territorial waters. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

Without the implementation of an in-season AM, management review of fishery performance relative to a catch limit would only occur after the end of each fishing year. Implementing the status quo would address concerns by the Council regarding taking action for the fishery that may result in adverse impacts to the Guam fishing community, but this alternative is not consistent with the purpose and need to establish a rebuilding plan with mechanisms to ensure the fishery is rebuilt from its overfished state consistent with NS1 requirements. Alternative 1 would, however, be consistent with other Magnuson-Stevens Act requirements, implementing regulations, and FEP provisions that require the Council to recommend and NMFS to set a catch limit for MUS on an annual basis.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, NMFS would implement a rebuilding plan with an ACL of 27,000 lb with an in-season AM. This would mirror the last ACL implemented in the fishery (86 FR 32361, June 21, 2021). However, this alternative would implement an in-season AM in contrast to Alternative 1, which would only implement a post-season AM. Under the in-season AM, NMFS would monitor the fishery and, if the ACL was projected to be reached, would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. Additionally, as a higher performance standard under Alternative 2, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. During a closure of Federal waters, NMFS would prohibit fishing for and possession of BMUS in Federal waters. While NMFS would monitor catch in both territorial and Federal waters and use that when assessing catch against the ACL, the Federal catch limit would not limit catch in territorial waters. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

The recent average catch from 2018 – 2020 is 27,306 lb, so the proposed ACL is slightly lower than the recent three-year catch. It is not clear how often annual catches would exceed the ACL and trigger the in-season AM if catches are similar to the recent years, as annual catch from five of the past 10 years have exceeded the proposed ACL (Table 4). However, if catches remain similar to the recent three-year average in the first year of the rebuilding plan, the fishery would likely attain the implemented ACL in December.

If the in-season AM is triggered and Federal waters are closed to fishing for the remainder of the year, in the absence of a complementary closure in territorial waters and assuming constant fishing effort throughout the year, NMFS estimates that there would be a reduction of catch in the fishery of 81 lb under Alternative 2. That is, using the recent three-year average catch of

27,306 lb and the amount of habitat in Federal and territorial waters as a proxy for overall catch composition, NMFS expects the fishery would be projected to reach the ACL of 27,000 lb four days before the end of the year and approximately 81 lb which may have been harvested in Federal waters during that time would not be caught.

$$27,306 \text{ lb} \div 365 \text{ days} = 74.8 \text{ lb/day}$$

$$306 \text{ lb} \div 74.8 \text{ lb/day} = \sim 4 \text{ days}$$

$$306 \text{ lb} \div 26.4\% \text{ estimated habitat in Federal waters} = \sim 81 \text{ lb of catch restricted due to the in-season AM and closure of Federal waters}$$

If the in-season AM is triggered and fishing continues unrestricted in territorial waters, the fishery may still exceed the ACL. For example, in the above scenario, if Federal waters are closed without complementary management, NMFS expects that 225 lb of bottomfish could still be harvested from territorial waters. Therefore, the total amount of catch at the end of the fishing year could be 27,225, which would exceed the ACL. It is possible that as NMFS estimates and reports the current catch amount, participants in the fishery may reduce effort as catch approaches the ACL in order to reduce the likelihood that the ACL is exceeded and a closure of Federal waters occurs.

If Federal waters were closed in subsequent fishing years, using the recent three-year average catch of 27,306 lb and the amount of habitat in Federal and territorial waters as a proxy for overall catch composition, NMFS estimates that there could be an annual reduction of catch in the fishery of 7,209 lb. To put it another way, even with a closure in Federal waters, the total amount of annual catch could still be 20,097 lb. However, it is anticipated that some fishing effort may be displaced from Federal waters to unrestricted territorial waters in response to a closure of Federal waters. Thus, the expected annual catch could be higher than 20,097 lb.

Under the scenario in which the Guam Government does decide to implement complementary management alongside this Federal action, annual catch would be limited to 27,000 lb. In subsequent years, if the ACL is exceeded and the higher performance standard is triggered, the fishery would be completely closed in both territorial and Federal waters for the duration of the rebuilding plan or until a new coordinated management approach can be implemented, resulting in an annual catch of 0 lb.

In summary, if complementary management is not implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, or intensity when compared to the Status Quo, but it would change with respect to catch and areas fished if bottomfish fishing was prohibited in Federal waters. Furthermore, fishermen who fish mainly in Federal waters may be affected more by a temporary closure of Federal water or substantially by a longer term closure of federal waters. It is likely that catch would exceed the proposed ACL even after NMFS implements the in-season AM (i.e., closes Federal waters) due to continued fishing in territorial waters if complementary management is not implemented. If complementary management is implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, participation, or intensity while the fishery remains open compared to the Status Quo, but it would experience large impacts with respect to fishery operations and associated harvests if bottomfish fishing was prohibited in Federal and territorial waters. It is less likely that catch would exceed the proposed ACL if a complementary closure is implemented in territorial waters

at the same time NMFS implements the in-season AM, as needed. Regardless if complementary management is implemented or not, catch levels under Alternative 2 would likely be more restrictive than the recent annual average catch and when compared to the Status Quo due to the in-season AM and the higher performance standard. Alternative 2 has the potential to result in reduced fishery impacts on the bottomfish stock complex relative to Alternative 1 while limiting adverse social, cultural, and economic effects on the fishing community relative to Alternatives 3 and 5 by allowing a marginally lower catch than recent years.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, NMFS would implement a rebuilding plan with an ACL of 16,299 lb with an in-season AM. This alternative would implement an in-season AM in contrast to Alternative 1, which would only implement a post-season AM. Under the in-season AM, NMFS would monitor the fishery and, if the ACL was projected to be reached, would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. Additionally, as a higher performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. During a closure of Federal waters, NMFS would prohibit fishing for and possession of BMUS in Federal waters. While NMFS would monitor catch in both territorial and Federal waters and use that when assessing catch against the ACL, the Federal catch limit would not limit catch in territorial waters. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

The recent average catch from 2018 – 2020 is 27,306 lb, so the proposed ACL represents 60% of the most recent three-year catch. It is not clear how often annual catches would exceed the ACL and trigger the in-season AM. Catch from six of the past 10 years has exceeded the proposed ACL (Table 4). If catches remain similar to the recent three-year average, the fishery could attain the proposed ACL by August, and NMFS would close the fishery in Federal waters for the remainder of the fishing year in accordance with the in-season AM. If the fishery exceeds the ACL, NMFS would close the fishery in Federal water for subsequent years in accordance with the higher performance standard.

If the in-season AM is triggered and Federal waters are closed to fishing for the remainder of the year, in the absence of a complementary closure in territorial waters and assuming constant fishing effort throughout the year, NMFS estimates that there would be a reduction of catch in the fishery of 2,906 lb under Alternative 3. That is, using the recent three-year average catch of 27,306 lb and the amount of habitat in Federal and territorial waters as a proxy for overall catch composition, NMFS expects the fishery would reach the ACL of 16,299 lb in August and approximately 2,906 lb that may have been harvested in Federal waters from August onward will not be caught. Refer to Alternative 2 in this Section for information on how this calculation is determined.

If the in-season AM is triggered and fishing continues unrestricted in territorial waters, the fishery may still exceed the ACL. For example, in the above scenario, NMFS expects that 11,007

lb of bottomfish could still be harvested from territorial waters after Federal waters are closed (i.e., from August onward). Therefore, the total amount of catch at the end of the fishing year could be 24,400 lb which would exceed the ACL. It is anticipated that some fishing effort may be displaced from Federal waters to unrestricted territorial waters in response to a closure of Federal waters. Therefore the expected catch could be higher than 24,400 lb. However, it is also possible that as NMFS estimates and reports the current catch amount, participants in the fishery may reduce effort as catch approaches the ACL in order to reduce the likelihood that the ACL is exceeded and a closure of Federal waters occurs.

In the event the ACL is exceeded, the higher performance standard would be triggered and Federal waters would be closed until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. If Federal waters were closed in subsequent fishing years, using the recent three-year average catch of 27,306 lb and the amount of habitat in Federal and territorial waters as a proxy for overall catch composition, NMFS estimates that there could be an annual reduction of catch in the fishery of 7,209 lb. Similar to Alternative 2, even with a closure in Federal waters, the total amount of annual catch could still be 20,097 lb or higher after accounting for displacement of fishing effort from Federal to territorial waters.

Under the scenario in which the Guam Government does decide to implement complementary management alongside this Federal action, annual catch would be limited to 16,299 lb. Similar to Alternative 2, in subsequent years, if the ACL is exceeded and the higher performance standard is triggered, the fishery would be completely closed in both territorial and Federal waters for the duration of the rebuilding plan or until a new coordinated management approach can be implemented, resulting in an annual catch of 0 lb.

In summary, if complementary management is not implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, or intensity compared to the status quo, but it would change with respect to catch and areas fished if bottomfish fishing was prohibited in Federal waters. Furthermore, fishermen who fish mainly in Federal waters could be affected substantially by either a temporary or longer term closure of federal waters. It is likely that catch would exceed the proposed ACL even after NMFS implements the in-season AM (i.e., closes Federal waters) due to continued fishing in territorial waters if complementary management is not implemented. If complementary management is implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, participation, or intensity while the fishery remains open, but it would experience large impacts with respect to fishery operations and associated harvests if bottomfish fishing was prohibited in Federal and territorial waters. It is less likely that catch would exceed the proposed ACL if a complementary closure is implemented in territorial waters at the same time NMFS implements the in-season AM, as needed. Regardless if complementary management is implemented or not, catch levels under Alternative 3 would likely be more restrictive than the recent annual average catch and when compared to the Status Quo. Alternative 3 has the potential to result in reduced fishery impacts on the bottomfish stock complex relative to Alternatives 1 and 2, but does less to mitigate adverse social, cultural, and economic effects on the fishing community.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, NMFS would implement a rebuilding plan with an ACL of 31,000 lb with an in-season AM. This alternative would implement an in-season AM in contrast to Alternative 1 which would only implement a post-season AM. Under the in-season AM, NMFS would monitor the fishery and, if the ACL was projected to be reached, would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. Additionally, as a higher performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. During a closure of Federal waters, NMFS would prohibit fishing for and possession of BMUS in Federal waters. While NMFS would monitor catch in both territorial and Federal waters and use that when assessing catch against the ACL, the Federal catch limit would not limit catch in territorial waters. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

The recent average catch from 2018 – 2020 is 27,306 lb, so the proposed ACL is slightly higher than the recent three-year catch. It is less likely that the ACL implemented under Alternative 4 would be exceeded relative to Alternatives 1, 2 or 3, as only two of the past 10 years have had catch levels that would surpass this level of authorized catch. If catches remain similar to the recent three-year average throughout the rebuilding plan, the fishery would not exceed the implemented ACL.

If catches occur at levels higher than the recent average, the in-season AM could be triggered and Federal waters would be closed to fishing for the remainder of the fishing year. In the absence of a complementary closure in territorial waters, there is a high likelihood that the ACL would be exceeded. In the event the ACL is exceeded, the higher performance standard would be triggered and Federal waters would be closed until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. If Federal waters were closed in subsequent fishing years, using the recent three-year average catch of 27,306 lb and the amount of habitat in Federal and territorial waters as a proxy for overall catch composition, NMFS estimates that there could be an annual reduction of catch in the fishery of 7,209 lb. That is, similar to Alternative 2 and 3, even with a closure in Federal waters, the total amount of annual catch could still be 20,097 lb. However, it is anticipated that some fishing effort may be displaced from Federal waters to unrestricted territorial waters in response to a closure of Federal waters. Thus, the expected annual catch could be higher than 20,097 lb.

Under the scenario in which the Guam Government does decide to implement complementary management alongside this Federal action, annual catch would be limited to 31,000 lb. Similar to Alternative 2 and 3, if the ACL is exceeded and the higher performance standard is triggered, the fishery would be completely closed in both territorial and Federal waters for the duration of the

rebuilding plan or until a new coordinated management approach can be implemented, resulting in an annual catch of 0 lb.

In summary, if complementary management is not implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, participation, or intensity when compared to the Status Quo, but it could change slightly with respect to catch and areas fished since bottomfish fishing may be prohibited in Federal waters if catches are relatively high in a given year. Furthermore, fishermen who fish mainly in Federal waters may be affected more by a temporary closure of Federal water or substantially by a longer term closure of federal waters. It is likely that catch would exceed the proposed ACL even after NMFS implements the in-season AM (i.e., closes Federal waters) due to continued fishing in territorial waters if complementary management is not implemented. If complementary management is implemented, the fishery is not expected to change the way it fishes with respect to fishing gear, effort, participation, or intensity while the fishery remains open compared to the Status Quo, but it would experience large impacts with respect to fishery operations and associated harvests if bottomfish fishing was prohibited in Federal and territorial waters. It is less likely that catch would exceed the proposed ACL if a complementary closure is implemented in territorial waters at the same time NMFS implements the in-season AM, as needed. Regardless if complementary management is implemented or not, Alternative 4 has the least restrictive ACL as well as provides the lowest chance to exceed the ACL and require a closure of Federal waters compared to Alternatives 1, 2, and 3. This alternative also has the potential to result in reduced fishery impacts on the bottomfish stock complex relative to Alternative 1, due to the in-season AM and the higher performance standard, while providing the least social, cultural, and economic impacts on the fishing community relative to the Alternatives 1, 2, and 3 by allowing a higher catch than recent years.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, NMFS would prohibit fishing for and possession of BMUS in Federal waters around Guam. This alternative is functionally equivalent to an ACL of 0 lb and addresses the overfished state of Guam bottomfish in the shortest time possible. There would be no AM or higher performance standard associated with this alternative because catch would not need to be tracked against an ACL. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

If only Federal waters were closed, using the recent three-year average catch of 27,306 lb and the amount of habitat in Federal and territorial waters as a proxy for overall catch composition, NMFS estimates that there could be an annual reduction of catch in the fishery of 7,209 lb. That is, similar to Alternatives 2, 3 and 4, even with a closure in Federal waters, the total amount of annual catch could still be 20,097 lb. It is anticipated that some fishing effort may be displaced from Federal waters to unrestricted territorial waters in response to a closure of Federal waters. Thus, the expected annual catch could be higher than 20,097 lb.

The fishery is not expected to make any significant changes to its fishing gear, effort, participation, or intensity as a result of this alternative when compared to the Status Quo, but NMFS expects moderate changes for the total amount of catch and areas fished since bottomfish fishing would be prohibited in Federal waters. Fishermen who fish mainly in Federal waters

would be substantially affected by a long term closure of federal waters. If complementary management is implemented and bottomfish fishing was prohibited in both Federal and territorial waters, the fishery would experience large impacts with respect to fishery operations and associated harvests. Alternative 5 has the potential to reduce adverse effects to the Guam bottomfish stock on a faster timeline relative to Alternatives 1 through 4, however, this alternative would do less than all other alternatives to minimize negative impacts to the Guam fishing community.

3.7 Guam Fishing Community and Potential Effects of the Alternatives

The Magnuson-Stevens Act defines a fishing community as “a community that is substantially dependent upon or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and fish processors that are based in such communities” (16 U.S.C. § 1802(16)). NMFS further specifies in the NS guidelines that a fishing community is “a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries dependent services and industries (for example, boatyards, ice suppliers, tackle shops).”

In 1998, the Council identified Guam as a fishing community and requested the Secretary of Commerce concur with this determination. Guam was recognized in regulation as a fishing community under the Magnuson-Stevens Act on April 19, 1999 (64 FR 19067). The community continues to participate in the Council decision-making process through its representatives on the Council, its Advisory Panel members, through opportunities for public input during the Council’s deliberations, through public comment periods during NMFS rulemaking processes. The most recent SAFE report (WPFMC 2021) was the just the second iteration of the report to present sales data after the ECS amendment that revised the list of BMUS in the Mariana Archipelago from 17 to 13 species, so estimates of commercial sales of just the 13 species that remain categorized as BMUS only recently became available. The species that remain BMUS were selected in part because of their importance to the fishery, and likely comprised most reported sales prior to the ECS amendment.

This action evaluates the effect management alternatives may have on the economy, way of life, and traditions of human communities, including fishing communities. Table 7 in Section 2.3.3 shows that in between 2018 and 2020, Guam bottomfish fishermen caught an average of 27,306 lb of BMUS annually and, in 2017 and 2018, sold an average of 3,515 lb of BMUS (i.e., an average of 17.5 percent of the estimated catch). Data in 2019 and 2020 were confidential because there were less than three dealers and/or vendors reporting for the commercial receipt book program in Guam. Based on the commercial estimate of pounds sold (3,028 lb) and the commercial value (\$15,443) of the fishery in 2018, the average price per pound was \$5.10. The 2021 LOF estimated there were greater than 300 participants in the fishery (86 FR 3028, January 14, 2021). If participation and effort were equal among fishermen in 2018, each of the 300 fishermen would have sold roughly 10 lb of BMUS valued at over \$51 for each fisherman. While social and economic impacts could be solely experienced by individuals, it is possible that impacts would be experienced across communities, gear types, and/or vessel size classes.

3.7.1 Potential Effects of the Alternatives on the Socio-Economic Setting

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would implement an ACL of 27,000 lb with no in-season AM to prevent the ACL from being exceeded but with a post-season AM to correct overages. This would mirror the last management action taken for the fishery (86 FR 32361, June 21, 2021). The level of bottomfish catch under this alternative is expected to be similar to the average annual catch in recent years (27,306 lb from 2018 to 2020) regardless of the implementation of complementary management in territorial waters. No available information indicates that commercial sales would change, so NMFS anticipates that an average of 17.5 percent of catch would be sold (based on data from 2017 and 2018), which would result in 4,779 lb of bottomfish sold commercially. Using the recent average price of \$4.82 per lb from 2017 to 2018, this would generate approximately \$23,033 in revenue. The 300 participants in the fishery would earn approximately \$77 each (Table 19). NMFS does not expect this outcome to change whether or not complementary management is implemented by the territory (Table 19). Since there is no in-season AM under this alternative, the proposed action would not constrain bottomfish fishing activity in Guam, so it is not expected to affect the fishing communities in Guam. Similarly, non-commercial fishing (inclusive of recreational, sustenance, and cultural fishing) would be unaffected relative to recent activity under the status quo alternative.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, NMFS would implement a rebuilding plan with an ACL of 27,000 lb with an in-season AM. This would mirror the last ACL implemented in the fishery (86 FR 32361, June 21, 2021). Under the in-season AM, NMFS would monitor the fishery and, if the ACL was projected to be reached, would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. Additionally, as a higher performance standard under Alternative 2, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

Under Alternative 2, NMFS expects bottomfish catch to be 27,225 lb in the first year of the rebuilding plan if complementary management in territorial waters is not implemented (see Section 3.8 for information on the calculation of expected catch) which is similar to status quo. If total bottomfish catch in 2022 is 27,225 lb and 17.5 percent of the catch is sold commercially at \$4.82 pound, then 4,764 lb would be sold for \$22,964. Based on 300 participants, each fisherman would earn \$77 each in this scenario, which is similar to the status quo (Table 19). Under this scenario, the fishery would exceed the proposed ACL in the first year even after NMFS implements the in-season AM (i.e., closes Federal waters for the remainder of the fishing year) due to continued fishing in territorial waters if complementary management is not implemented as well as displacement of any fishing effort from Federal to territorial waters. If the ACL is exceeded and the higher performance standard is implemented without complementary

management in territorial waters, the expected catch from territorial waters in those fishing years of the rebuilding plan where Federal waters are closed could be 20,097 lb or possibly higher, due to displacement of any fishing effort from Federal to territorial waters. At this level of expected catch, NMFS anticipates that 3,517 lb would be sold for a total of \$16,952, or \$57 per fisher (Table 19).

If complementary management is implemented, catch would be limited to 27,000 lb in the first year of the rebuilding plan, resulting in a total revenue of \$22,775, or \$76 per fisherman, which is similar to the status quo (Table 19). This level of revenue would continue unless the fishery exceeds the ACL and the higher performance standard is implemented. If the higher performance standard was applied, catch and revenue would both be reduced to zero since bottomfish fishing would be prohibited in both territorial and Federal waters.

Table 14. Estimated revenues in the Guam bottomfish fishery under Alternatives 1 – 5 and under the scenarios if complementary management is implemented in territorial waters.

All estimates assume 17.5 percent of the expected catch is sold, a price per lb of \$4.82, and 300 participants in the fishery. For Alternatives 2 - 4, the table also compares revenue if the higher performance standard (HPS) is not implemented (i.e., the ACL is not exceeded and Federal waters are not closed for the duration of the rebuilding plan), which is expected early on in the rebuilding plan, and if the HPS is implemented, which could occur only after the first year of the rebuilding plan and through subsequent years. 2022 is the first fishing year of the rebuilding plan. Revenue is rounded to the nearest dollar.

	Alt.	Comp mgmt by territory?	Expected catch	Expected lb sold	Total revenue (\$)	Revenue per participant (\$)	\$ Difference in Fisher Revenue from Alt. 1	% Difference in Catch and Revenue from Alt. 1
Annually	1	No	27,306	4,779	23,033	\$77	-	-
	1	Yes	27,306	4,779	23,033	\$77	-	-
HPS not Implemented	2	No	27,225	4,764	22,964	\$77	\$0	< 1
	2	Yes	27,000	4,725	22,775	\$76	- \$1	-1.1
HPS implemented	2	No	20,097	3,517	16,952	\$57	- \$20	-26.4
	2	Yes	0	0	0	\$0	- \$77	-100
HPS not Implemented	3	No	24,400	4,270	20,581	\$69	- \$8	-10.6
	3	Yes	16,299	2,852	13,748	\$46	- \$31	-40.3
HPS implemented	3	No	20,097	3,517	16,952	\$56	- \$20	-26.4
	3	Yes	0	0	0	\$0	- \$77	-100
HPS not Implemented	4	No	27,306	4,779	23,033	\$77	\$0	0.0
	4	Yes	27,306	4,779	23,033	\$77	\$0	0.0
HPS implemented	4	No	20,097	3,517	16,952	\$57	- \$20	-26.4
	4	Yes	0	0	0	\$0	- \$77	-100
Annually	5	No	20,097	3,517	16,952	\$57	- \$20	-26.4
	5	Yes	0	0	0	\$0	- \$77	-100

There is not detailed information on whether catch for commercial or non-commercial purposes comes disproportionately from territorial or Federal waters. Overall, NMFS expects that the amount of fish caught for sustenance and recreational purposes would be affected similarly to fish caught for commercial purposes. If complementary management is not implemented, there is no expected disruption to the fishery that would result in any substantial social or economic effects to the Guam fishing community due to the low level of expected decreases in revenue for each participating bottomfish fisherman. If complementary management is implemented, there would be significant impacts to the Guam fishing community resulting from the restriction on fishing in both territorial and Federal waters, which would decrease available bottomfish resources and revenues for the community to zero. Therefore, assuming the fishery maintains catch at the recent three-year average, there would be a decrease of 0.3 to 100 percent in fish available for sustenance and recreational purposes under Alternative 2 compared to the status quo depending on application of the higher performance standard and implementation of complementary management by the Guam Government.

In summary, NMFS intends the proposed ACL under this alternative to provide for continued availability of bottomfish resources slightly below the status quo to the Guam fishing community while promoting rebuilding for the stock complex. Revenue and availability of Guam bottomfish to the community may be slightly or completely reduced from the status quo, depending on the application of the higher performance standard and the implementation of complementary management in territorial waters. If the ACL is not exceeded and the higher performance standard is not implemented, which is expected to occur early on in the rebuilding plan, revenues and fish available to the community would be similar to the status quo regardless if complementary management is implemented in territorial waters or not. If the ACL is exceeded and the higher performance standard is implemented, which could happen as early as the second year of the rebuilding plan, there would be a decrease in revenue and fish availability regardless if complementary management is implemented or not. However, the extent of the reduction in revenue would be much greater if complementary management is implemented by the territory. This is because NMFS expects that there would be displacement of fishing effort from Federal waters if territorial waters remain open. If fishermen compensated for a closure of Federal waters by continuing to fish in territorial waters, revenue and fish availability could be closer to that expected under the status quo. However, it is possible that not all fishing effort would be displaced as those fishermen who prefer to fish in Federal waters may choose not to fish in territorial waters.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, NMFS would implement a rebuilding plan with an ACL of 16,299 lb with an in-season AM. Under the in-season AM, NMFS would monitor the fishery and, if the ACL was projected to be reached, would monitor the fishery and, if the ACL was projected to be reached, would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. Additionally, as a higher performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels

that allow the stock to rebuild. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

Under Alternative 3, NMFS expects bottomfish catch to be 24,400 lb in the first year of the rebuilding plan if complementary management in territorial waters is not implemented (see Section 3.8 for information on the calculation of expected catch). This amount of catch is slightly lower than the status quo. If total bottomfish catch in 2022 is 24,400 lb and 17.5 percent of the catch is sold commercially at \$4.82 pound, then 4,270 lb would be sold for \$20,581. Based on 300 participants, each fisherman would earn \$69 each in this scenario, which is slightly lower than the status quo (Table 19). It is possible that catch could exceed the proposed ACL even after NMFS implements the in-season AM (i.e., closes Federal waters for the remainder of the fishing year) due to continued fishing in territorial waters if complementary management is not implemented as well as displacement of any fishing effort from Federal to territorial waters. If the ACL is exceeded and the higher performance standard is implemented without complementary management in territorial waters, the expected catch in those years of the rebuilding plan could be 20,097 lb or possibly higher due to displacement of any fishing effort from Federal to territorial waters. At this level of expected catch, NMFS anticipates that 3,517 lb would be sold for a total of \$16,952, or \$57 per fisher (Table 19), which represents a decrease of \$20 (26.4 percent) from the status quo alternative.

If complementary management is implemented, catch would be limited to 16,299 lb in the first year of the rebuilding plan, resulting in a total revenue of \$13,748, or \$46 per fishermen. This level of revenue would continue unless the fishery exceeds the ACL and the higher performance standard is implemented. If the higher performance standard was applied, catch and revenue would both be reduced to zero since bottomfish fishing would be prohibited in both territorial and Federal waters.

NMFS expects that the amount of fish caught for sustenance and cultural purposes would be affected similarly to fish caught for commercial purposes, as described under Alternative 2. Specifically, there may be a decrease in available fish for sustenance and recreational purposes of 10.6 to 100 percent from this alternative relative to the status quo.

In summary, NMFS intends the proposed ACL under Alternative 3 to provide for continued, although reduced, availability of bottomfish resources to the Guam fishing community while promoting rebuilding for the stock complex. Revenue and availability of bottomfish to the community may be lower or completely reduced from the status quo, regardless if complementary management or the higher performance standard is implemented. However, the extent of the reduction in revenue and fish availability would be much greater if complementary management is implemented by the territory due to the displacement of fishing effort as described under Alternative 2. The greatest reduction would occur if both complementary management and the higher performance standard were implemented.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, NMFS would implement a rebuilding plan with an ACL of 31,000 lb with an in-season AM. Under the in-season AM, NMFS would monitor the fishery and, if the ACL was projected to be reached, would monitor the fishery and, if the ACL was projected to be reached, would notify fishermen that Federal waters would be closed to bottomfish fishing at the projected date through the remainder of the year, or immediately if it is determined the ACL has already been attained. Additionally, as a higher performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

Given the high ACL, the expected effects of Alternative 4 are similar to those expected under the status quo alternative even though an in-season AM is being included in the management program. Bottomfish catch is expected to be similar to the recent annual average catch of 27,306 lb but may be reduced relative to the status quo alternative if a year of relatively high catch occurs (e.g., 2018 or 2019, see Section 3.8 for information on the calculation of expected catch). The extent of the reduction in a year of high catch is dependent on the decision to implement complementary management or not in territorial waters. In the absence of complementary management, if total bottomfish catch is 27,306 lb and 17.5 percent of the catch is sold commercially at \$4.82 pound, then 4,779 lb would be sold for \$23,033. The 300 participants in the fishery would earn \$77 each in this scenario, which is the same as the status quo alternative (Table 19). In years of high fishery catch, however, catch could be restricted in Federal waters through the use of the in-season AM, but would still overall be higher relative to the baseline. It is possible that catch could exceed the proposed ACL even after NMFS implements the in-season AM (i.e., closes Federal waters for the remainder of the fishing year) due to continued fishing in territorial waters if complementary management is not implemented as well as displacement of any fishing effort from Federal to territorial waters. If the ACL is exceeded and the higher performance standard is implemented without complementary management in territorial waters, the expected catch from territorial waters in those fishing years of the rebuilding plan where Federal waters are closed could be 20,097 lb or possibly higher, due to displacement of any fishing effort from Federal to territorial waters. At this level of expected catch, NMFS anticipates that 3,517 lb would be sold for a total of \$16,952, or \$57 per fisher (Table 19).

If complementary management is implemented, catch would be limited to 31,000 lb, which would be associated with a total revenue of \$26,149. This level of revenue would continue unless the fishery exceeds the ACL and the higher performance standard is implemented. If the higher performance standard was applied, catch and revenue would both be reduced to zero since bottomfish fishing would be prohibited in both territorial and Federal waters.

NMFS expects that the amount of fish caught for sustenance and cultural purposes would be affected similarly to fish caught for commercial purposes, as described under Alternative 3. Regardless if complementary management is implemented or not, if the fishery maintains catches at the recent annual average, then there would be no expected decrease in fish available or revenue to the Guam fishing community relative to the status quo alternative. If a year of relatively high catch occurs and the fishery exceeds the ACL, then the higher performance standard would be implemented. There would be a decrease of 26.4 to 100 percent in fish available for sustenance and recreational purposes under Alternative 4 compared to the status quo depending on the implementation of complementary management in territorial waters.

In summary, NMFS intends the proposed ACL under this alternative to provide for continued availability of average, or even slightly higher, levels of bottomfish resources to the Guam fishing community while also promoting rebuilding for the stock complex. Revenue and availability of Guam bottomfish to the community may be the same or completely reduced from the status quo, depending on the application of the higher performance standard and the implementation of complementary management in territorial waters. If the ACL is not exceeded and the higher performance standard is not implemented, revenues and fish available to the community would be the same as the status quo regardless if complementary management is implemented in territorial waters or not. While this alternative presents the lowest likelihood that the ACL would be exceeded, if catch does exceed the ACL and the higher performance standard is implemented, then there would be a decrease in revenue and fish availability regardless if complementary management is implemented or not. However, the extent of the reduction in revenue would be much greater if complementary management is implemented by the territory. This is because NMFS expects that there would be displacement of fishing effort from Federal waters if territorial waters remain open, as described under Alternative 2. Given the levels of recent catch in the fishery relative to the proposed ACL, there is a lower chance that annual catch would exceed the ACL than under Alternatives 1 - 3, which makes application of the in-season AM and higher performance standard less likely. Therefore implementation of Alternative 4 is not expected to notably change the Guam bottomfish fishery or cause substantial social or economic impacts to the Guam fishing community relative to the baseline during the time frame of the rebuilding plan during years of average fishing activity.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, NMFS would prohibit fishing for and possession of BMUS in Federal waters around Guam. This alternative is functionally equivalent to an ACL of 0 lb and addresses the overfished state of Guam bottomfish in the shortest time possible. There would be no AM or higher performance standard associated with this alternative because catch would not need to be tracked against an ACL. Whether restrictions would also be in place for the fishery in territorial waters is dependent on the territory's decision to implement complementary management or not.

Under Alternative 5, bottomfish catch may be moderately or completely reduced from the recent average depending on the implementation of complementary management. In the absence of complementary management, NMFS expects catch to be 20,097 lb (see Section 3.8 for information on the calculation of expected catch). If total bottomfish catch is 20,097 lb and 17.5 percent of the catch is sold commercially at \$4.82 pound, then 3,517 lb would be sold for

\$16,952. The 300 participants in the fishery would earn an average of \$57 each. This is a decrease of \$20, or 26.4 percent from the status quo alternative (Table 19). If complementary management is implemented, catch and revenue would both be reduced to zero since bottomfish fishing would be prohibited in both territorial and Federal waters.

NMFS expects that the amount of fish caught for sustenance and cultural purposes would be affected similarly to fish caught for commercial purposes, as described under Alternative 2. Specifically, there may be a decrease in available fish for sustenance and recreational purposes of 26.4 to 100 percent from this alternative relative to the status quo.

In summary, Alternative 5 does not provide for authorized catch in Federal waters, but territorial waters would remain open to fishing for bottomfish in the absence of complementary management. This would allow for some availability of bottomfish resources to the Guam fishing community for the duration of the rebuilding plan. Revenue and availability of bottomfish to the community would be moderately lower or completely reduced relative to the status quo. However, if fishermen compensated for a closure of Federal waters by displacing their effort into territorial waters, revenue and fish availability could be closer to that expected under the status quo. If complementary management is implemented, there would be substantial impacts to the Guam fishing community due to the lack of bottomfish resources and commercial revenue from the fishery. Overall, implementation of Alternative 5 is expected to affect the fishery and associated communities more than the status quo and other action alternatives.

3.7.2 Public Health and Safety at Sea

Considering the past and current operation of the Guam bottomfish fishery, there have been no noted adverse effects on public health and no significant concerns with safety at sea. The fishery has not typically fostered a “race to fish.” NMFS expects this to remain consistent under the status quo. Under Alternatives 2 through 4, the fishery could be subject to a closure of Federal waters; however, NMFS expects fishing to continue in territorial waters where the majority of bottomfish habitat occurs (73.6 percent, see Figure 1) in the absence of complementary management, so a race to fish is not expected. Alternative 5, which would implement a complete closure of Federal waters to bottomfish fishing, is also not expected to result in a race to fish without complementary management since territorial waters would remain open and unrestricted to bottomfish fishing. If complementary management is implemented for Alternatives 2 through 4 and a closure of Federal waters is enacted, there may be a resulting race to fish due to the parallel closure of territorial waters. The implementation of complementary management under Alternative 5 would not result in a race to fish because both territorial and Federal waters would be closed to the fishery for the duration of the rebuilding plan. Because none of the proposed alternatives are expected to result in drastic changes to fishery operations as they are currently in the absence of complementary management and the majority of bottomfish habitat would remain unrestricted with respect to the harvest of BMUS, none of the proposed alternatives are expected to result in an increased likelihood for impacts to public health, issues associated with safety at sea, or a race to fish for bottomfish fishermen in Guam. If complementary management is enacted by the territory, a race to fish may be fostered due to the restrictions imposed on the fishery in both territorial and Federal waters once the ACL is attained.

3.7.3 Potential for Controversy

The Council developed the proposed action for implementation by NMFS via a public process in accordance with the Magnuson-Stevens Act, implementing regulations, the Mariana Archipelago FEP, and other applicable statutes. NMFS and the Council's SSC determined the results of the 2019 stock assessment (Langseth et al. 2019) to be BSIA (Section 1.2), which allows the stock assessment to be used in the setting of ACLs for the Guam bottomfish stock complex consistent with NS2 and the Mariana Archipelago FEP. The Council immediately began work towards this proposed action, as required by the Magnuson-Stevens Act, in consultation with its advisory bodies, NMFS fishery scientists and managers, and DAWR. The Council used BSIA in the development of this proposed action alongside input from the public during publicly noticed Council meetings. This public coordination has not revealed significant controversy regarding impacts to the quality of the human environment from this action (Section 3.4.1). However, Guam bottomfish fishermen and members of the Council have expressed concerns at Council meetings regarding the social, cultural, and economic effects of reducing the availability of bottomfish to the Guam fishing community and that the data used in the stock assessment were not adequate to make the determination that the Guam bottomfish stock complex is overfished.

The concerns regarding adverse impacts to fishermen from this outcome were reflected in the Council's development of the action alternatives, which included ACLs ranging from moderately less than the three-year average catch level for the fishery to greater than this level of catch. The 31,000 lb authorized level of catch under Alternative 4, the Council's preferred alternative, would prevent overfishing according to the six-year OFL estimated by Langseth et al. (2019) and would rebuild the bottomfish stock complex from its overfished designation in nine years; the alternative would also take the needs of the Guam fishing community into account by implementing the alternative with the highest likelihood of Federal waters remaining open to fishermen while rebuilding within 10 years as required by NS1 of the Magnuson-Stevens Act. Thus, Alternative 4 addresses impacts to the fishery and associated fishing community to the extent permissible by the Magnuson-Stevens Act and implementing regulations by allowing a level of annual catch that is slightly more than recent annual catches and allows the stock complex to rebuild within the timeframe allowed under statutory requirements. Alternative 4 would also restrict overfishing relative to the status quo in years where there is variably high catch in the fishery and mitigate socioeconomic impacts to the fishing community relative to the maximum action that the Council could recommend (i.e., a closure of Federal waters to the fishery until the stock complex rebuilds). Thus, the preferred alternative satisfies regulatory requirements to prevent overfishing and rebuild the stock complex while considering the needs of the fishery and fishing communities by providing a slightly reduced amount of catch that would allow for the management measure to be permissible under regulatory constraints. The Council and NMFS will solicit additional public comments on the potential effects of the proposed action over a 60-day public comment period on the draft EA and associated with this rulemaking.

3.8 Protected Species in Guam and Potential Effects of the Alternatives

A number of protected species are reported from the waters around the Mariana Islands and there is the potential for interactions with the bottomfish fisheries of Guam and the CNMI. NMFS has evaluated the bottomfish fisheries for effects on protected resources and manages these fisheries in compliance with the requirements of the Magnuson-Stevens Act, the MMPA, the ESA, the

MBTA, and other applicable statutes. For the reader's interest, more detailed descriptions of potentially affected protected resources and their life histories in Section 3.3.3 of the FEP for the Mariana Archipelago (WPFMC 2009).

3.8.1 Applicable ESA Coordination for Guam

In a biological opinion covering the Fishery Management Plan (FMP) for Bottomfish and Seamount Groundfish Fisheries of the Western Pacific, dated March 8, 2002, NMFS determined that bottomfish and seamount groundfish fisheries of the western Pacific region that operate in accordance with regulations implementing the FMP were not likely to adversely affect ESA-listed sea turtle and marine mammal species or their designated critical habitat. This is largely due to the fact that bottomfish fishing vessels are anchored or moving slowly while engaging in fishing, and there are no reports or observations of substantial interactions between bottomfish fisheries in the Mariana Archipelago and protected species.

In an informal consultation letter dated June 3, 2008, NMFS determined that the continued authorization of bottomfish fisheries of the Mariana Archipelago, including the bottomfish fishery around the Mariana Archipelago, as managed under the Bottomfish and Seamount Groundfish FMP, was not likely to adversely affect ESA-listed sea turtles and marine mammal species or their designated critical habitat.

On April 6, 2016, NMFS and USFWS published a final rule finding that the green sea turtle is composed of 11 DPSs and proposed to replace the current range-wide listing with listing of the DPSs as threatened or endangered (81 FR 20057). The population around the Mariana Archipelago is part of the Central West Pacific DPS, which is now listed as endangered; however, determination for this DPS under past consultations remain unchanged.

On July 3, 2014, NMFS published a final rule that listed four DPSs of scalloped hammerhead shark under the ESA (79 FR 38213). The threatened Indo-West Pacific DPS is the only DPS that occurs around the Mariana Archipelago. On September 10, 2014, NMFS published a final rule that listed 20 species of reef-building corals as threatened under the ESA (79 FR 53852). Of the 20 listed species, three are thought to occur in the Mariana Archipelago. On April 29, 2015, NMFS determined that the continued authorization of the coral reef, bottomfish, crustacean, and precious coral fisheries under the FEP for the Mariana Archipelago may affect, but is not likely to adversely affect the Indo-West Pacific DPS of scalloped hammerhead shark and reef-building corals (NMFS 2015).

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). On June 5, 2019, NMFS re-initiated ESA consultation for the Guam and CNMI bottomfish fisheries in response to the listing of the oceanic whitetip shark (83 FR 4153, January 30, 2018) and giant manta ray (83 FR 2916, January 22, 2018) as threatened species under the ESA. These species occur within the area of operation the fisheries. In a biological evaluation (BE) dated June 5, 2019, prepared in support of re-initiated consultation, NMFS requested concurrence with its determination that the Guam and CNMI bottomfish fisheries may affect, but are not likely to adversely affect:

- Loggerhead, leatherback, olive ridley, green, and hawksbill sea turtles;

- Humpback, blue, fin, sei, and sperm whales;
- Indo-West Pacific DPS of scalloped hammerhead shark;
- Giant manta ray; and
- Three reef-building corals – *Acropora globiceps*, *A. retusa*, and *Seriatopora aculeata*.

In the 2019 BE, NMFS also determined that the continued operation of the Guam and CNMI bottomfish fisheries are likely to adversely affect the oceanic whitetip shark, and have requested formal consultation under the ESA. On June 6, 2019, August 11, 2020, and December 15, 2020, NMFS determined that, pending the completed consultation, the continued operation of the bottomfish fishery in Guam during the period of consultation 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, and would not violate ESA Section 7(d) (NMFS 2019b; NMFS 2020a; NMFS 2020b).

The following sections provide additional information on sea turtles, marine mammals, seabirds, corals, giant manta rays, and sharks in Guam.

3.8.2 Sea Turtles in Guam

All sea turtles are subject to protection under the ESA in Guam. Direct harvest, direct harm, and indirect harm are prohibited unless the ESA Section 9 prohibition on take is otherwise exempted otherwise authorized. NMFS has coordinated the continued authorization of the Guam bottomfish fishery under Section 7 of the ESA. All six sea turtle species occurring in U.S. waters are listed under the ESA. The range of four of these species overlaps with the EEZ around Guam, and they may be encountered by fishermen. Table 14 lists the sea turtle species reasonably likely to occur around Guam. No critical habitat has been established for any sea turtle species in Guam.

Sea turtles currently face many threats, including (1) direct harvest of animals and eggs or predation; (2) incidental interactions with fisheries; (3) collisions with vessels and automobiles; (4) urban development / loss of habitat; (5) pollution (e.g., plastics); and (6) climate change. Sea turtle conservation initiatives are also in place, including restoration of habitats, laws to protect turtles, and management of threats to help provide for recovery. More information on the conservation of sea turtles is available on the [NMFS website](#).

Both commercial and non-commercial fisheries have the potential to cause adverse effects to sea turtles, including injuries and mortalities that occur incidental to fishing, such as fishing gear or vessel interactions. The most likely impacts of the bottomfish fishery in Guam on sea turtles is the potential for vessel collisions causing injuries and mortalities. The frequency of this type of effect is unknown in Guam. However, given the modest number of bottomfish fishing vessels in Guam (an estimated 62 vessels; WPFMC 2021), and the fact that bottomfish fishing occurs while either at anchor or slowly drifting over fishing grounds, sea turtle collisions with vessels in this fishery are expected to be rare. As Table 14 indicates, no records exist of interactions between the Guam bottomfish fishery and sea turtles.

Table 15. ESA-listed sea turtles known to occur or reasonably expected to occur in waters around Guam.

Common names/DPS if applicable	Scientific Name	ESA listing status in Guam	Occurrence in Guam	Interactions with the Guam bottomfish fishery through 2020
Green sea turtle (haggan betde) Central West Pacific DPS	<i>Chelonia mydas</i>	Endangered DPS	Most common turtle in the Mariana Archipelago. Foraging and minor nesting confirmed.	No interactions observed or reported.
Hawksbill sea turtle (haggan karai)	<i>Eretmochelys imbricata</i>	Endangered	Small population foraging with low level nesting.	No interactions observed or reported.
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered	Occasional sightings. Overall occurrence is unknown.	No interactions observed or reported.
Olive ridley sea turtle	<i>Lepidochelys olivacea</i>	Threatened	Range across the Pacific Ocean; not confirmed around Guam.	No interactions observed or reported.
Loggerhead sea turtle	<i>Caretta caretta</i>	Endangered	May range in the waters of the Mariana Archipelago.	No interactions observed or reported.

Potential Effects of the Alternatives on Sea Turtles in Guam

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would not implement a rebuilding plan but would implement the same ACL and post-season AM for the Guam bottomfish fishery as specified for 2020 through 2022. The 2002 ESA consultation evaluated the potential impact of the Guam bottomfish fishery prior to the implementation of management measures such as ACLs, and the lack of an in-season AM to functionally constrain the fishery under this alternative is not expected to change the conduct of the fishery relative to operations considered under this consultation. NMFS expects the fishery to continue catching bottomfish as it has in recent years under the status quo (Section 2.3.1). Because Alternative 1 is not expected to result in changes to fishing activity relative to years considered in previous consultations, regardless of the implementation of complementary management, this alternative would not increase the potential for, or severity of, interactions between the fishery and ESA-listed sea turtles. The fishery is not likely to adversely affect any ESA-listed sea turtle species under this alternative, and vessel collisions are expected to be rare. In summary, previous consultations found that the Guam bottomfish fishery is not likely to

adversely affect sea turtles, and because fishing activity under Alternative 1 is not expected to change, this alternative is not likely to cause any adverse effects to ESA-listed sea turtle species.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, NMFS would implement a rebuilding plan with an ACL of 27,000 lb, an in-season AM to close fishing for BMUS in Federal waters for the remainder of the fishing year if available information indicates that catch would attain the ACL, and a higher performance standard to close the fishery in Federal waters if the fishery exceeds the ACL until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. NMFS expects BMUS catch in future years to be less than the recent average, depending on the implementation of complementary management, and may be restricted by a closure of Federal waters if the ACL is exceeded (Section 2.4.1). Because there have been no reported interactions with any species of sea turtles for this fishery in territorial or Federal waters, this change is not expected to affect the number of interactions. Additionally, NMFS expects fishing activity under Alternative 2 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and listed sea turtles. If complementary management is implemented, there would be no displacement of fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which would further decrease the likelihood of interactions occurring in the fishery. Thus, implementation of Alternative 2 is not expected to change or increase interactions with listed sea turtles in any way not already considered in prior consultations. Under this alternative, the fishery is not likely to adversely affect any listed sea turtle species, vessel collisions would be rare, and there is no anticipated change to the number, severity, or types of interactions with sea turtles.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, NMFS would implement a rebuilding plan with an ACL of 16,299 lb, an in-season AM to close fishing for BMUS in Federal waters for the remainder of the fishing year if available information indicates that catch would attain the ACL, and a higher performance standard to close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. NMFS expects BMUS catch in future years to be less than the recent average due to the closure of Federal waters when the ACL is reached in accordance with the in-season AM and higher performance standard, which may result in the displacement of fishing activity to unrestricted territorial waters if complementary management is not implemented (Section 2.5.1). Because there have been no reported interactions with any species of sea turtles for the Guam bottomfish fishery in territorial or Federal waters, additional fishing in territorial waters is not expected to affect the number of interactions. Additionally, NMFS expects fishing activity under Alternative 3 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and listed sea turtles. If complementary management is implemented, there would be no displacement of bottomfish fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which

would further decrease the likelihood of interactions occurring in the fishery. Thus, implementation of Alternative 3 is not expected to change or increase interactions with listed sea turtles in any way not already considered in prior consultations. Under this alternative, the fishery is not likely to adversely affect any listed sea turtle species, vessel collisions would be rare, and there is no anticipated change to the number, severity, or types of interactions with sea turtles.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, NMFS would implement an ACL of 31,000 lb, an in-season AM to close fishing for BMUS in Federal waters for the remainder of the fishing year if available information indicates that the ACL would be reached, and a higher performance standard to close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. BMUS catch in future years is expected to be comparable to the recent average but may be restricted by a closure of Federal waters if the ACL is exceeded in years of high catch (Section 2.6.1). Because there have been no reported interactions with any species of sea turtles for this fishery in territorial or Federal waters, this change is not expected to affect the number of interactions. Additionally, fishing activity under Alternative 4 is expected to be relatively similar to the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and listed sea turtles. If complementary management is implemented, there would be no displacement of fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which would further decrease the likelihood of interactions occurring in the fishery. Thus, implementation of Alternative 4 is not expected to change or increase interactions with listed sea turtles in any way not already considered in prior consultations. Under this alternative, the fishery is not likely to adversely affect any listed sea turtle species, vessel collisions would be rare, and there is no anticipated change to the number, severity, or types of interactions.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, NMFS would prohibit fishing for bottomfish in Federal waters around Guam, and NMFS expects that BMUS catch may be reduced from the recent average and some fishing activity may move into territorial waters due to the closure of Federal waters if complementary management is not enacted. NMFS expects BMUS catch to be reduced from the recent average due to the closure of Federal waters around Guam to bottomfish fishing, though some fishing may be displaced into territorial waters if complementary management is not implemented (Section 2.7.1). Since this fishery has no reported interactions with any species of sea turtle in territorial or Federal waters, this change is not expected to affect the number of interactions in the fishery. NMFS expects that fishing activity under Alternative 5 would be less than the status quo or completely restricted, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and listed sea turtles in any way not already considered in prior consultations. Thus, implementation of Alternative 3 is not expected to change or increase interactions with listed sea turtles. If complementary management is implemented, the fishery would be restricted in both territorial and Federal

waters, eliminating the likelihood of interactions occurring. Under this alternative, the fishery is not likely to adversely affect any listed sea turtle species, vessel collisions would be rare, and there is no anticipated change to the number, severity, or types of interactions with sea turtles.

All Alternatives

Overall, no alternative considered would substantially change fishing activity in the Guam fishery such that there would be adverse effects to listed sea turtles that have not already been considered in prior consultations of the fishery under the ESA.

3.8.3 Marine Mammals in Guam

Marine mammal species that are reasonably likely to occur in the Mariana Archipelago are listed in Table 15. In accordance with ESA Section 7(a)(2), NMFS previously evaluated the potential impacts of the Guam bottomfish fishery to ESA-listed marine mammals and determined that the fishery is not likely to adversely affect any species or critical habitat in the action area. NMFS documented its determinations in a Biological Opinion for bottomfish fisheries on March 8, 2002 and a Letter of Concurrence for bottomfish fisheries on June 3, 2008 (NMFS 2002; NMFS 2008). The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S. and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction). Additionally, the ESA lists five whale species known to occur in the EEZ around Guam (see note under Table 15). Additionally, a single ESA-listed dugong that was observed in Cocos Lagoon in 1975 (Randall et al. 1975). There have been no reports of dugong sightings since then.

Marine Mammal Protection Act Coordination

The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S. and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction). NMFS classifies the Guam bottomfish fishery as a Category III fishery under Section 118 of the MMPA (86 FR 3028, January 14, 2021). A Category III fishery is one with a low likelihood or no known incidental takings of marine mammals.

Potential Effects of the Alternatives on Marine Mammals in Guam

None of the alternatives considered are expected to impact marine mammals because the Guam bottomfish fishery is not known to affect marine mammals through gear interactions or through disruptions in or adverse effects on prey, and no alternative would change the conduct of the bottomfish fishery in a manner that would alter the type or frequency of marine mammal interactions with the fishery.

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would implement the same ACL and post-season AM applied to the fishery in the most recent management action, with no in-season AM to functionally constrain the fishery. The bottomfish fishery is not known to adversely affect marine mammals in terms of noise, water pollution, accidental entanglement, or competition for food resources. No interactions have been reported between the fishery and marine mammals (Table 15). There have been no comprehensive diet studies of piscivorous marine mammals in Guam and their relationship to the fishery to date. However, evaluation of the bottomfish fishery in Hawaii did not find that it would adversely modify prey populations important to the insular false killer

whale (NMFS 2018). The bottomfish fishery in Guam is similar in terms of gear, methods, and species targeted, so it can be reasonably concluded that the fishery is not adversely affecting prey available to marine mammals. Under Alternative 1, the fishery would continue to catch bottomfish as it has in recent years (Section 2.3.1), and catches would continue to be monitored through the fisheries monitoring programs administered by DAWR with assistance from NMFS. In recent years, the fishery has not interacted with or affected marine mammals, and the fishery is not expected to change under Alternative 1, so interactions with marine mammals are not anticipated under this alternative.

Table 16. Marine mammals known to occur in waters around Guam.

Common Name	Scientific Name	Interactions with the Guam bottomfish Fishery through 2020
Humpback whale*	<i>Megaptera novaeangliae</i>	No interactions observed or reported.
Sperm whale*	<i>Physeter macrocephalus</i>	No interactions observed or reported.
Blue whale*	<i>Balaenoptera musculus</i>	No interactions observed or reported.
Fin Whale*	<i>Balaenoptera physalus</i>	No interactions observed or reported.
Sei whale*	<i>Balaenoptera borealis</i>	No interactions observed or reported.
Blainville's beaked whale	<i>Mesoplodon densirostris</i>	No interactions observed or reported.
Bottlenose dolphin	<i>Tursiops truncatus</i>	No interactions observed or reported.
Bryde's whale	<i>Balaenoptera edeni</i>	No interactions observed or reported.
Common dolphin	<i>Delphinus delphis</i>	No interactions observed or reported.
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	No interactions observed or reported.
Dwarf sperm whale	<i>Kogia sima</i>	No interactions observed or reported.
Dugong*	<i>Dugong</i>	No interactions observed or reported.
False killer whale	<i>Pseudorca crassidens</i>	No interactions observed or reported.
Fraser's dolphin	<i>Lagenodelphis hosei</i>	No interactions observed or reported.
Killer whale	<i>Orcinus orca</i>	No interactions observed or reported.
Longman's beaked whale	<i>Indopacetus pacificus</i>	No interactions observed or reported.
Melon-headed whale	<i>Peponocephala electra</i>	No interactions observed or reported.
Minke whale	<i>Balaenoptera acutorostrata</i>	No interactions observed or reported.
Pygmy killer whale	<i>Feresa attenuata</i>	No interactions observed or reported.
Pygmy sperm whale	<i>Kogia breviceps</i>	No interactions observed or reported.
Risso's dolphin	<i>Grampus griseus</i>	No interactions observed or reported.
Rough-toothed dolphin	<i>Steno bredanensis</i>	No interactions observed or reported.
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	No interactions observed or reported.
Spinner dolphin	<i>Stenella longirostris</i>	No interactions observed or reported.
Spotted dolphin	<i>Stenella attenuata</i>	No interactions observed or reported.
Striped dolphin	<i>Stenella coeruleoalba</i>	No interactions observed or reported.

(Source: Eldredge 2003; Randall et al. 1975; Guam DAWR 2006; [Council website](#))

* Species is also listed under the ESA.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, NMFS would implement a rebuilding plan with an ACL of 27,000 lb, an in-season AM to close fishing for BMUS in Federal waters for the remainder of the fishing year if available information indicates that catch would attain the ACL, and a higher performance standard to close the fishery in Federal waters if the fishery exceeds the ACL until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Under this alternative, NMFS expects that BMUS catch would be less than the recent average but some fishing activity may move into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.4.1). However, since this fishery has no reported interactions with any species of marine mammal in territorial or Federal waters, this change is not expected to affect the number of interactions. Further, since NMFS expects fishing activity under Alternative 2 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and marine mammals in any way, implementation of Alternative 2 is not expected to change or increase interactions with marine mammals. If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. In summary, this alternative is not expected to change the conduct of the fishery in any way that would affect marine mammals, so interactions with marine mammals and a change to the number, severity, or type of interactions with marine mammals is not expected.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, NMFS would implement a rebuilding plan with an ACL of 16,299 lb, an in-season AM to close fishing for BMUS in Federal waters for the remainder of the fishing year if available information indicates that catch would attain the ACL, and a higher performance standard to close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Under this alternative, NMFS expects that BMUS catch may be reduced from the recent average and some fishing activity may move into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.5.1). However, since this fishery has no reported interactions with any species of marine mammal in territorial or Federal waters, this change is not expected to affect the number of interactions. Further, since NMFS expects fishing activity under Alternative 3 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and marine mammals in any way, implementation of Alternative 3 is not expected to change or increase interactions with marine mammals. If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. In summary, this alternative is not expected to change the conduct of the fishery in any way that would affect marine mammals, so interactions with marine mammals and a change to the number, severity, or type of interactions with marine mammals is not expected.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, NMFS would implement a rebuilding plan with an ACL of 31,000 lb, an in-season AM to close fishing for BMUS in Federal waters for the remainder of the fishing year if available information indicates that the ACL would be reached, and a higher performance standard to close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild. Under this alternative, it is expected that BMUS catch would be comparable to the recent average and some fishing activity may move into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.6.1). However, since this fishery has no reported interactions with any species of marine mammal in territorial or Federal waters, this change is not expected to affect the number of interactions. Further, since fishing activity under Alternative 4 is expected to be similar to the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and marine mammals in any way, implementation of Alternative 4 is not expected to change or increase interactions with marine mammals. If complementary management is implemented, there would be no displacement of fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which would further decrease the likelihood of interactions occurring in the fishery. In summary, this alternative is not expected to change the conduct of the fishery in any way that would affect marine mammals, so interactions with marine mammals and a change to the number, severity, or type of interactions with marine mammals is not expected.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, NMFS would prohibit fishing for bottomfish in Federal waters around Guam, and NMFS expects that BMUS catch may be reduced from the recent average and some fishing activity may move into territorial waters due to the closure of Federal waters if complementary management is not enacted. However, since this fishery has no reported interactions with any species of marine mammal in territorial or Federal waters, this change is not expected to affect the number of interactions. Additionally, since NMFS expects that fishing activity under Alternative 5 would be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and marine mammals in any way, implementation of Alternative 5 is not expected to change or increase interactions with marine mammals. If complementary management is implemented, fishing activity would be completely restricted, eliminating the likelihood of interactions occurring in the fishery. Overall, this alternative is not expected to change the conduct of the fishery in any way that would affect marine mammals, so interactions with marine mammals and a change to the number, severity, or type of interactions with marine mammals is not expected.

All Alternatives

In summary, there is no new information that indicates that the Guam bottomfish fishery may affect ESA-listed marine mammals in a manner or to an extent not previously considered in past

consultations. All prior consultations for ESA-listed marine mammals species remain valid and effective. Because the fishery has had no known interactions with marine mammals, because interactions with marine mammals are expected to remain rare under any of the alternatives under consideration, and because none of the alternatives would substantially change the conduct of the fishery in a way that would impact marine mammals, the fishery is not expected to interact with marine mammals under any of the considered alternatives.

3.8.3.1 Seabirds in Guam

Table 16 lists seabird species that are considered residents or visitors of Guam. Of the presented species, only the Newell’s shearwater is listed as threatened under the ESA. According to Wiles (2003), the only resident seabirds in Guam are the brown noddy and the white tern. There have been no sightings of the endangered short-tailed albatross (*Phoebastria albatrus*) although the Mariana Archipelago is within the range of the only breeding colony at Torishima, Japan (WPFMC 2009). There have been no reports of interactions between the Guam bottomfish fishery and seabirds (WPFMC 2009).

Table 17. Seabirds occurring in Guam. (Source: WPFMC 2009).

English name	Scientific name
Residents (i.e., breeding)	
Brown noddy	<i>Anous stolidus</i>
Common fairy-tern (white tern)	<i>Gygis alba</i>
Visitors/vagrants/accidental visitors	
Newell’s shearwater (ESA threatened)	<i>Puffinus auricularis newelli</i>
Wedge-tailed shearwater	<i>Puffinus pacificus</i>
Audubon’s shearwater	<i>Puffinus lherminieri</i>
Short-tailed shearwater	<i>Puffinus tenuirostris</i>
Leach’s storm-petrel	<i>Oceanodroma leucorhoa</i>
Matsudaira’s storm-petrel	<i>Oceanodroma matsudairae</i>
Red-footed booby	<i>Sula</i>
Brown booby	<i>Sula leucogaster</i>
Masked booby	<i>Sula dactylatra</i>
White-tailed tropicbird	<i>Phaethon lepturus</i>
Red-tailed tropicbird	<i>Phaethon rubricauda</i>
Great frigatebird	<i>Fregata minor</i>
Sooty tern	<i>Onychoprion fuscatus</i>
Black noddy	<i>Anous minutus</i>

Potential Effects of the Alternatives on Seabirds in Guam

None of the alternatives under consideration are expected to affect seabirds, as the Guam bottomfish fishery is not known to affect seabirds through gear interactions or through disruptions in or adverse effects on seabird prey since seabirds are not known to prey on bottomfish. No alternative considered would change the bottomfish fishery in a manner that

would change the type or frequency of interactions with seabirds so the effects of the fishery under both action alternatives are expected to be insignificant.

3.8.4 ESA-Listed Reef Building Corals in Guam

On September 10, 2014, NMFS listed 20 species of reef-building corals as threatened under the ESA (79 FR 53852). Three species of listed corals are known to occur in waters around Guam from 0-40 m deep. None of the species have common names.

On November 27, 2020, NMFS published a proposed rule in the Federal Register (85 FR 76262) to designate critical habitat for the seven threatened corals in U.S. waters in the Indo-Pacific pursuant to Section 4 of the ESA. Three of these corals occur around Guam: *Acropora globiceps*, *Acropora retusa*, and *Seriatopora aculeata*. Specific occupied areas containing physical features essential to the conservation of these coral species are being proposed for designation as critical habitat. At this point in time there is insufficient information to determine the proposed designation's potential impacts on the Guam bottomfish fishery. If the proposal is finalized, NMFS would re-initiate consultation under Section 7 of the ESA to determine the impact of fishing activities on critical habitat and any necessary management measures.

Table 17 lists the ESA-listed coral species found in Guam. Corals usually live in colonies and form “heads” or “shelves”. Generally, thousands of individual coral organisms (polyps) live together in a single structure that grows over time. Recently, many nearshore coral reefs have died through a process called bleaching when coral expel algae that live within them. Bleaching often leads to death for coral colonies by causing malnutrition and increasing the colony’s susceptibility to disease. Some coral species populations have suffered declines because of bleaching.

Table 18. ESA-listed corals in Guam.

Common name	Scientific Name	ESA listing status in Guam	Occurrence in Guam	Interactions with the Guam bottomfish fishery
None	<i>Acropora globiceps</i>	Threatened	Present	No interactions observed or reported
None	<i>A. retusa</i>	Threatened	Present	No interactions observed or reported
None	<i>Seriatopora aculeata</i>	Threatened	Present	No interactions observed or reported

Potential Effects of the Alternatives on ESA-Listed Reef Building Corals in Guam

Some damage to corals and bottom habitat is possible via anchoring or entanglement of bottomfish fishing gear, but studies in Hawaii where methods are similar found that bottomfish fishing generally has minimal impact on benthic habitat (Kelley and Moffit 2004; Kelley and Ikehara 2006). The bottomfish fishery is a hook-and-line fishery, and fishermen have an interest in minimizing both interactions, not only for the conservation benefit, but also because they do not want to lose their gear. The FEP also protects corals and habitat through prohibitions on the use of bottom-set nets, bottom trawls, explosives, and poisons (WPFMC 2009). Guam

regulations also prohibit the use of explosives (5 GCA § 63104), poisonous or intoxicating substances (5 GCA § 63106), and electrical devices (5 GCA § 63108), specify requirements for the use of gill nets (5 GCA § 63112) including the prohibition of the use of drift gill nets, and prohibit the destruction of coral in the pursuit of fishing (5 GCA § 63113). Federal regulations also state that it is unlawful for any person to fish for, take, or retain any wild live rock or live hard coral except under a valid special permit for scientific research, aquaculture seed stock collection or traditional and ceremonial purposes by indigenous people (50 CFR 665.125(c)). Additionally, territory regulations pursuant to 5 GCA § 63602 prohibits the removal of live coral around Guam. On April 2, 2015, NMFS documented its determination in a Letter of Concurrence that the continued authorization of the bottomfish fishery in Guam is not likely to adversely affect reef-building corals. Methods, locations, and target species of bottomfish fishery operations have not changed substantially since 2015. Also, the fishery has not had any known interactions with listed corals. Based on this information, NMFS reasonably concludes that the analysis in that 2015 consultation and its conclusion that the fishery is not likely to adversely affect listed corals remains valid today. On June 5, 2019, NMFS reinitiated consultation in response to listing of the oceanic whitetip shark, giant manta ray, and chambered nautilus, and to seek concurrence with the conclusion that the Guam bottomfish fishery may affect, but is not likely to affect, any listed coral.

Alternative 1: No Action / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would implement an ACL of 27,000 lb with no in-season AM to prevent the ACL from being exceeded but with a post-season AM to correct overages for the Guam bottomfish fishery. The 2015 consultation evaluated the potential impact of the bottomfish fishery on ESA-listed corals under a similar management regimen with ACLs and AMs, so NMFS expects that the fishery would continue to catch bottomfish under the status quo in the same way as recent years because the fishery in 2015 was not functionally constrained by the implemented ACLs and AMs (Section 2.3.1). Because this alternative is not expected to change fishing activity relative to years considered the 2015 consultation, the status quo would not increase the potential for, or severity of, interactions between the fishery and listed corals, and the fishery is not likely to adversely affect listed coral species. In summary, the previous consultation found that the bottomfish fishery is not likely to adversely affect corals, and the fishery is not expected to change under Alternative 1, so this alternative is not likely to cause the fishery to adversely affect any listed coral species.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under this alternative, BMUS catch may be less than the status quo, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented as an AM and in accordance with the higher performance standard in the absence of complementary management (Section 2.4.1). However, since this fishery has no reported interactions with any species of listed coral in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 2 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and listed corals in any way not already considered in prior consultations, implementation of Alternative 2 is not expected to change or increase interactions with listed corals. If complementary management is implemented, fishing activity

would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. There is no anticipated change to the number, severity, or type of interactions with listed corals under this alternative.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, BMUS catch may be reduced from the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.5.1). However, since this fishery has no reported interactions with any species of listed coral in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 3 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and listed corals in any way not already considered in prior consultations, implementation of Alternative 3 is not expected to change or increase interactions with listed corals. If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with listed corals under this alternative.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, BMUS catch may be similar to the recent average or slightly more in years with relatively high catch, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.6.1). However, since this fishery has no reported interactions with any species of listed coral in territorial or Federal waters, this change is not expected to affect the number of interactions. Since fishing activity under Alternative 4 is expected to be comparable to the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and listed corals in any way not already considered in prior consultations, implementation of this alternative is not expected to change or increase interactions with listed corals. If complementary management is implemented, there would be no displacement of fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which would further decrease the likelihood of interactions occurring in the fishery. There is no anticipated change to the number, severity, or type of interactions with listed corals under Alternative 4.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under this alternative, NMFS expects BMUS catch to be reduced from the recent average, and some fishing activity may be displaced into territorial waters due to the closure of Federal waters for the duration of the rebuilding plan in the absence of complementary management (Section 2.7.1). However, since this fishery has no reported interactions with any listed species of coral in territorial or Federal waters, this change is not expected to affect the number of interactions. Further, since NMFS expects fishing activity under Alternative 5 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of

interactions between the fishery and listed corals in any way not already considered in prior consultations, implementation of Alternative 5 is not expected to change or increase interactions with listed corals. If complementary management is implemented, fishing activity would be completely restricted, precluding the likelihood of interactions occurring. There is no anticipated change to the number, severity, or type of interactions with listed corals under this alternative.

All Alternatives

In summary, the bottomfish fishery has no recorded interactions with listed corals, and no alternative under consideration would substantially change the conduct of the fishery in a manner that would result in impacts to listed corals, so NMFS does not expect effects on listed coral species that have not already been considered in prior consultations of the fishery under the ESA. Under all alternatives considered, the proposed action is not expected to have a substantial effect on the overall population size of ESA-listed corals in Guam.

3.8.5 Scalloped Hammerhead Sharks in Guam

On July 3, 2014, NMFS listed the Indo-West Pacific scalloped hammerhead shark DPS under the ESA (79 FR 38213). The Indo-West Pacific scalloped hammerhead shark DPS occurs in all U.S. Pacific Island territories. Scalloped hammerhead sharks range widely from nearshore to pelagic environments and from the surface to 500 meters (m) deep. Because the shark is listed in Guam, it is illegal to target or retain the shark.

As noted in the final rule (79 FR 38213, July 3, 2014), the significant operative threats to the listed scalloped hammerhead DPSs are overutilization by foreign industrial, commercial, and artisanal fisheries as well as inadequate regulatory mechanisms in foreign nations to protect these sharks from the heavy fishing pressure and related mortality, with illegal fishing identified as a significant problem in areas outside of U.S. jurisdiction. The final rule indicated some fishermen target sharks, including the scalloped hammerhead, to harvest their fins, but illegal finning is not reported in or suspected to be occurring by Guam bottomfish or troll fishery participants. Incidental capture in fisheries also contributes to increased mortality in this species (79 FR 38213, July 3, 2014).

Conservation initiatives for scalloped hammerhead sharks are in place and include, in addition to the Federal prohibition on retention of the scalloped hammerhead DPS, territorial prohibitions on the retention or transport of any sharks. Additionally, the territorial government passed a law in 2011 (5 GCA § 63114.1) stating that no person shall possess or sell shark fins without a permit or unless for subsistence, traditional, or cultural sharing purposes.

Potential Effects of the Alternatives on Scalloped Hammerhead Sharks in Guam

NMFS conducted Section 7 consultation under the ESA to evaluate the potential effects of the Guam bottomfish fisheries on the Indo-West Pacific DPS of scalloped hammerhead shark. This consultation found that Guam bottomfish fisheries did not have any recorded or observed catches of scalloped hammerhead sharks based creel survey data (NMFS 2015). On April 2, 2015, NMFS concluded that the continued authorization of the bottomfish fishery under the Mariana Archipelago is not likely to adversely affect the Indo-west Pacific scalloped hammerhead shark DPS. Their conclusion was based on the finding that the effects of reauthorizing the fishery were expected to be discountable, as fishery participants are very unlikely interact with Indo-West

Pacific scalloped hammerhead sharks because of limited distribution and the location of the sharks in relation to preferred bottomfish locations and gear depth. Methods, locations, and target species of fishery operations have not changed substantially since 2015. Also, the fishery has not had any known interactions with scalloped hammerhead sharks. Based on this information, NMFS reasonably concludes that the analysis in that 2015 consultation, and the conclusion that the fishery is not likely to adversely affect this species, remain valid today. On June 5, 2019, NMFS reinitiated consultation in response to listing of the oceanic whitetip shark, giant manta ray, and chambered nautilus, and to seek concurrence with the conclusion that the Guam bottomfish fishery may affect, but is not likely to affect, the Indo-West Pacific DPS of scalloped hammerhead shark.

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would implement same ACL and post-season AM for the Guam bottomfish fishery as specified for 2020 through 2022 with no in-season AM to functionally constrain the fishery. While the 2015 consultation evaluated the potential impact of the bottomfish fishery on scalloped hammerheads under management measures such as ACLs and AMs, NMFS expects the fishery to continue to catch bottomfish under this alternative in the same way as recent years because the fishery in 2015 was also not functionally constrained by the implemented ACLs or AMs (Section 2.3.1). Because the 2015 consultation found that effects of the fishery on the Indo-West Pacific scalloped hammerhead shark DPS would be insignificant and discountable and this alternative is not expected to change fishing activity relative to years considered in the 2015 consultation, this alternative would not increase the potential for, or severity of, interactions between the fishery and the Indo-West Pacific scalloped hammerhead shark, the fishery is not likely to adversely affect this DPS. In summary, the previous consultation found that the bottomfish fishery is not likely to adversely affect the Indo-West Pacific DPS of scalloped hammerhead shark, and under Alternative 1 the fishery is not expected to change, so the fishery is not likely to adversely affect this DPS under the proposed action.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, BMUS catch may be less than the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.4.1). However, since this fishery has no reported interactions with scalloped hammerhead sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 2 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the Indo-West Pacific scalloped hammerhead shark in any way not already considered in prior consultations, implementation of Alternative 2 is not expected to change or increase interactions with this DPS.

If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with this DPS.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, BMUS catch may be reduced from the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented without complementary (Section 2.5.1). However, since this fishery has no reported interactions with scalloped hammerhead sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 3 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the Indo-West Pacific scalloped hammerhead shark in any way not already considered in prior consultations, implementation of Alternative 3 is not expected to change or increase interactions with this DPS.

If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with this DPS.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, BMUS catch may be comparable to the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented as an AM in years of high catches without complementary management (Section 2.6.1). However, since this fishery has no reported interactions with scalloped hammerhead sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since fishing activity under Alternative 4 is expected to be similar to the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the Indo-West Pacific scalloped hammerhead shark in any way not already considered in prior consultations, implementation of Alternative 4 is not expected to change or increase interactions with this DPS. If complementary management is implemented, there would be no displacement of fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which would further decrease the likelihood of interactions occurring in the fishery. There is no anticipated change to the number, severity, or type of interactions with this DPS.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, BMUS catch may be reduced from the recent average, and some fishing activity may be displaced into territorial waters due to the complete closure of Federal waters without complementary management (Section 2.7.1). However, since this fishery has no reported interactions with scalloped hammerhead sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 5 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the Indo-West Pacific scalloped hammerhead shark in any way not already considered in prior consultations,

implementation of Alternative 5 is not expected to change or increase interactions with this DPS. If complementary management is implemented, fishing activity would be completely restricted, precluding the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with this DPS.

All Alternatives

There are no targeted shark fisheries in Guam, and regulations prohibit possession and sale of shark fins. The likelihood of interactions is low, and the 2015 consultation found that Guam fisheries did not have any recorded or observed catches of scalloped hammerhead sharks (NMFS 2015). No alternative under consideration would substantially change the way the fishery is conducted in a manner that would result in effects on scalloped hammerhead sharks that have not already been considered in the 2015 consultation. Under all alternatives considered, the proposed action is not expected to have a substantial effect on the overall population size of the Indo-West Pacific scalloped hammerhead shark DPS and is not likely to appreciably reduce the likelihood of both survival and recovery of the species in the wild.

3.8.6 Oceanic Whitetip Sharks in Guam

On January 30, 2018, NMFS issued a final rule to list the oceanic whitetip shark as threatened under the ESA (83 FR 4153). The oceanic whitetip shark is found in tropical and subtropical seas between 30° N and 35° S latitudes worldwide. The oceanic whitetip shark experiences high encounter and mortality rates in some commercial fisheries (e.g., pelagic longline, purse seine, and gillnet fisheries) throughout its range because of its tropical distribution and tendency to remain in surface waters (NMFS 2019a).

As noted in the final rule, the greatest threat to the oceanic whitetip shark is overutilization from fishing pressure and inadequate regulatory mechanisms to protect the species. However, Guam has territorial measures (5 GCA § 63114.1) that prohibit possession or sale of shark fins without a permit or unless for subsistence, traditional, or cultural sharing purposes. The best available information to estimate interactions with oceanic white tip sharks are boat-based creel surveys, and review of creel survey data from 1993 to 2017 found three reported captures of oceanic whitetip sharks while bottomfish fishing in Guam (NMFS 2019a). On June 5, 2019, NMFS reinitiated consultation under the ESA to seek concurrence that bottomfish fishing activities may adversely affect, through incidental capture in fishing operations, the oceanic whitetip shark, as required by 50 CFR 402.16. On June 6, 2019, August 11, 2020, and December 15, 2020, NMFS determined that, pending the completed consultation, the continued operation of the bottomfish fishery in Guam during the period of consultation 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, and would not violate ESA Section 7(d) (NMFS 2019b; NMFS 2020a; NMFS 2020b).

In July 2019, a team of international scientists completed a new stock assessment for the oceanic whitetip shark in the Western and Central Pacific Ocean (WCPO) (Tremblay-Boyer et al. 2019). Final indicators of stock status and key management quantities contained in the 2019 assessment the median value of the current total number of individuals in the WCPO is 775,214 (NMFS 2020a; NMFS 2020b). A conservative take estimate of one oceanic whitetip shark in the Guam bottomfish fishery during the period of the extended consultation represents less than a ten

thousandth of one percent of sharks in the WCPO. Sharks generally do not experience barotrauma when brought up from depth, and bottomfish fishermen tend to release hooked sharks alive by cutting their hook leaders (WPFMC and NMFS 2007). However, quantitative estimates of post-release mortality are not available.

Potential Effects of the Alternatives on Oceanic Whitetip Sharks in Guam

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, the Council would recommend and NMFS would implement the same ACL and post-season AM as specified for the Guam bottomfish fishery for 2020 through 2022 with no in-season AM. NMFS expects the bottomfish fishery to continue to catch bottomfish in a manner consistent with recent years, and catches would continue to be monitored through the fisheries monitoring program administered by DAWR with assistance from NMFS. The lack of an in-season AM under Alternative 1 would not provide regulatory oversight ability to limit catch or to promote the rebuilding of the resource. The level of bottomfish catch under this alternative is expected to be similar to average catch of 27,306 lb in recent years (2018 to 2020). The lack of an in-season AM under this alternative would not change the conduct of the fishery relative to recent years (Section 2.3.1). Therefore, this alternative is not expected to increase the potential for interactions between the fishery and oceanic whitetip shark in any way.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, BMUS catch may be less than the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.4.1). However, since this fishery has very few reported interactions with oceanic whitetip sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 2 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the oceanic whitetip shark in any way, implementation of Alternative 2 is not expected to change or increase interactions with this species. If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with oceanic whitetip sharks.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, BMUS catch may be reduced from the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.5.1). However, since this fishery has very few reported interactions with oceanic whitetip sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 3 to be slightly less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the oceanic whitetip shark in any way, implementation of Alternative 3 is not expected to change or increase interactions with this species. If complementary management is implemented, fishing activity

would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with oceanic whitetip sharks.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, BMUS catch may be comparable to the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented as an AM in years of high catches without complementary management (Section 2.6.1). However, since this fishery has very few reported interactions with oceanic whitetip sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since fishing activity under Alternative 4 is expected to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the oceanic whitetip shark in any way, implementation of Alternative 4 is not expected to change or increase interactions with this species. If complementary management is implemented, there would be no displacement of fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which would further decrease the likelihood of interactions occurring in the fishery. There is no anticipated change to the number, severity, or type of interactions with oceanic whitetip sharks.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, BMUS catch may be reduced from the recent average, and some fishing activity may be displaced into territorial waters due to the closure of Federal waters in the absence of complementary management (Section 2.7.1). However, since this fishery has very few reported interactions with oceanic whitetip sharks in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 5 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the oceanic whitetip shark in any way, implementation of Alternative 5 is not expected to change or increase interactions with this species. If complementary management is implemented, fishing activity would be completely restricted, precluding the likelihood of interactions occurring. There is no anticipated change to the number, severity, or type of interactions with oceanic whitetip sharks.

All Alternatives

There are no targeted shark fisheries in Guam, and regulations prohibit the possession and sale of shark fins. The alternatives under consideration would not change the way the fishery operates with respect to areas fished, gear used, or methods employed in a manner that would alter the likelihood of interactions with oceanic whitetip sharks, so increased interactions with this shark are not anticipated. Based on the infrequency expected interactions with oceanic whitetip sharks, the proposed action is not expected to have a substantial effect on the overall population size of oceanic whitetip sharks under all alternatives considered and is not likely to reduce appreciably the likelihood of both survival and recovery of the species in the wild.

3.8.7 Giant Manta Rays in Guam

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). The giant manta ray is found worldwide in tropical, subtropical, and temperate bodies of water. It is commonly found offshore, in oceanic waters, and near productive coastlines. As noted in the final rule (83 FR 2916, January 22, 2018), the giant manta ray appears to be most at risk of overutilization in the Indo-Pacific and eastern Pacific portions of its range. Targeted fishing and incidental capture of the species in Indonesia, Philippines, Sri Lanka, India, and throughout the eastern Pacific, has led to observed declines in populations.

There are no targeted giant manta ray fisheries in Guam. Manta rays are filter feeders who forage near the surface and do not interact with bottomfish fishing gear (Miller and Klimovich 2016). The rate at which the Guam bottomfish fishery interacts with giant manta rays in other ways is unknown; however, there are no reported or observed collisions with giant manta rays and bottomfish fishing vessels in any island area. Over the last ten years, there have been less than 100 trips per year on average (WPFMC 2021). Due to the small number of bottomfish trips in Guam and the fact that there have been no reported or observed collisions between giant manta rays and bottomfish fishing vessels, interactions between the bottomfish vessels and giant manta ray are not expected. On June 5, 2019, NMFS reinitiated informal consultation under ESA to seek concurrence that fishing activities are not likely to adversely affect this species, as required by 50 CFR 402.16 (NMFS 2019a). On June 6, 2019, August 11, 2020, and December 15, 2020, NMFS determined that pending that concurrence, the continued operation of the bottomfish fishery in Guam during the period of consultation 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, and would not violate ESA Section 7(d) (NMFS 2019b; NMFS 2020a; NMFS 2020b).

Potential Effects of the Alternatives on Giant Manta Rays in Guam

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS would implement the same ACL and post-season AM for the Guam bottomfish fishery as specified for 2020 through 2022 with no in-season AM to functionally constrain the fishery. NMFS expects the fishery to continue to catch bottomfish in a manner similar to recent years, and catches would continue to be monitored through the fisheries monitoring program administered by DAWR with assistance from NMFS. The lack of an in-season AM under Alternative 1 would not provide regulatory ability to restrict overfishing and ensure rebuilding of the stock complex during years of variably high catch; however, the level of bottomfish catch under this alternative is expected to be similar to the average annual catch in recent years (27,306 lb from 2018 to 2020). The lack of an in-season AM under this alternative is not expected to change the conduct of the fishery since catches would not be constrained (Section 2.3.1). Therefore, this alternative would not increase the potential for interactions between the fishery and giant manta ray in any way.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, BMUS catch may be reduced relative to the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is

implemented without complementary management (Section 2.4.1). However, since this fishery has no reported interactions with giant manta rays in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 2 to be less the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the giant manta ray in any way, implementation of Alternative 2 is not expected to change or increase interactions with this species. If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with giant manta rays.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, BMUS catch may be reduced from the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented without complementary management (Section 2.5.1). However, since this fishery has no reported interactions with giant manta rays in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 3 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the giant manta ray in any way, implementation of Alternative 3 is not expected to change or increase interactions with this species. If complementary management is implemented, fishing activity would be substantially reduced in the event of an ACL exceedance, further decreasing the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with giant manta rays.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under this alternative, BMUS catch may be comparable to the recent average, and some fishing activity may be displaced into territorial waters if a closure of Federal waters is implemented as an AM in years of high catches in the absence of complementary management (Section 2.6.1). However, since this fishery has no reported interactions with giant manta rays in territorial or Federal waters, this change is not expected to affect the number of interactions. Since fishing activity under Alternative 4 is expected to be similar to the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the giant manta ray in any way, implementation of Alternative 4 is not expected to change or increase interactions with this species. If complementary management is implemented, there would be no displacement of fishing effort to territorial waters since restrictions would occur in both territorial and Federal waters if the ACL is attained, which would further decrease the likelihood of interactions occurring in the fishery. There is no anticipated change to the number, severity, or type of interactions with giant manta rays.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, BMUS catch may be reduced from the recent average, and some fishing activity may be displaced into territorial waters due to the complete closure of Federal waters in the absence of complementary management (Section 2.7.1). However, since this fishery has no reported interactions with giant manta rays in territorial or Federal waters, this change is not expected to affect the number of interactions. Since NMFS expects fishing activity under Alternative 5 to be less than the status quo, and the status quo alternative is not expected to increase the potential for or severity of interactions between the fishery and the giant manta ray in any way not already considered in prior consultations, implementation of Alternative 5 is not expected to change or increase interactions with this species. If complementary management is implemented, fishing activity would be completely restricted, precluding the likelihood of interactions occurring. Thus, there is no anticipated change to the number, severity, or type of interactions with giant manta rays.

All Alternatives

The alternatives under consideration are not expected to change the way the fishery operates with respect to areas fished, gear used, or methods employed in a manner that would alter the likelihood of interactions with giant manta ray, so interactions with this species are not anticipated. Based on the lack of expected interactions with giant manta rays, the proposed action is not expected to have a substantial effect on the overall population size of the giant manta ray under all alternatives considered and is not likely to appreciably reduce the likelihood of both survival and recovery of the species in the wild.

3.9 Habitats and Vulnerable Ecosystems and Potential Effects of the Alternatives

3.9.1 Essential Fish Habitat and Habitat Areas of Particular Concern and Potential Effects of the Alternatives

The Magnuson-Stevens Act defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (Magnuson-Stevens Act § 3(10)). This includes the marine areas and their chemical and biological properties that organisms use. Substrate includes sediment, hard bottom, and other structural relief underlying the water column along with their associated biological communities. In 1999, the Council developed and NMFS approved EFH definitions for MUS of the Bottomfish and Seamount Groundfish FMP (Amendment 6), Crustacean FMP (Amendment 10), Pelagic FMP (Amendment 8), and Precious Corals FMP (Amendment 4) (64 FR 19067, April 19, 1999). NMFS approved additional EFH definitions for coral reef ecosystem species in 2004 as part of the implementation of the Coral Reef Ecosystem FMP (69 FR 8336, February 24, 2004). NMFS approved EFH definitions for deep water shrimp through an amendment to the Crustaceans FMP in 2008 (73 FR 70603, November 21, 2008).

In addition to and as a subset of EFH, the Council described habitat areas of particular concern (HAPC) based on the following criteria: ecological function of the habitat is important, habitat is sensitive to anthropogenic degradation, development activities are or would stress the habitat, and/or the habitat type is rare. The FMPs defined HAPC for bottomfish, crustaceans, pelagic, and

coral reef species in Guam, CNMI, and American Samoa and for bottomfish, pelagic, and coral reef species in the Pacific Remote Island Area.

Ten years later, in 2009, the Council developed and NMFS approved five new archipelagic-based FEPs. The FEPs incorporated and reorganized elements of the Councils' species-based FMPs into a spatially-oriented management plan (75 FR 2198, January 14, 2010). The Council subsequently carried forward EFH definitions and related provisions for all FMP fishery resources into the respective FEPs. In 2019, Amendment 4 to the American Samoa FEP and Amendment 5 to the Mariana FEP reclassified some bottomfish, pelagic, crustacean, precious coral, and coral reef ecosystem species as ecosystem component species (ECS) (84 FR 2767, February 8, 2019). These species do not have EFH or HAPC under the Magnuson-Stevens Act, as these habitat categories only apply to MUS. The following discussion and analysis of potential effects on EFH and HAPC would only consider these habitat designations for species remaining as BMUS.

Table 18 summarizes the designated areas of EFH and HAPC for Mariana FEP bottomfish by life stage. To analyze the potential effects of a proposed fishery management action on EFH, one must consider all designated EFH. According to the most recent bottomfish fishery ESA consultations for Guam (April 2, 2015), the current bottomfish fishery is unlikely to have an adverse effect on listed corals in Guam. The findings were based on the fact that the fishery has a small area of spatial overlap between potential coral habitat and bottomfish fishing, the fishery has a low likelihood of bottomfish gear contact based on fishing depth (i.e., no trawling, nets, traps, etc., and only a few weighted hooks and lines deployed at a time), and the fishermen participating in the fishery have a high motivation to avoid coral. Thus, this fishery is not known to adversely affect habitat. Similar methods are used to fish for bottomfish in Guam as in Hawaii, and studies of bottomfish habitat in Hawaii have not found adverse impacts to habitat from bottomfish fishing activities (Kelley and Moffit 2004; Kelley and Ikehara 2006). Also, to prevent and minimize adverse bottomfish fishing impacts to EFH, each western Pacific FEP prohibits the use of explosives, poisons, bottom trawl, and other non-selective and destructive fishing gear. No alternative under consideration for this rebuilding plan would result in substantial changes to the way fishermen conduct the bottomfish fishery in Guam that would impact EFH or HAPC. Therefore, the alternatives are not expected to result in adverse effects on bottomfish EFH or HAPC.

3.9.2 Marine Protected Areas (MPAs) and Potential Effects of the Alternatives

Harvesting bottomfish is prohibited in the territorial marine preserves where and/or when fishing is prohibited, such as the Achang Reef Flat or Tumon Bay Marine preserves, though these areas are typically nearshore. Bottomfish fishing is Federally managed in the Marianas Trench Marine National Monument (Monument), where commercial fishing is prohibited in the Islands Unit of the Monument and non-commercial fishing must be authorized under a permit. These MPAs would not be affected by the proposed action, so adverse effects to them would be unlikely under all alternatives considered. None of the proposed alternatives would change the way bottomfish fishing is conducted with respect to these MPAs, so continued operation of the fishery under the status quo or action alternatives would not result in adverse impacts to the Monument or other MPAs.

Table 19. EFH and HAPC for Guam BMUS.

Guam BMUS	EFH	HAPC
Lehi (<i>Aphareus rutilans</i>) Giant trevally (<i>Caranx ignobilis</i>) Black trevally (<i>Caranx lugubris</i>) Ehu (<i>Etelis carbunculus</i>) Onaga (<i>E. coruscans</i>) Redgill emperor (<i>Lethrinus rubrioperculatus</i>) Blueline snapper (<i>Lutjanus kasmira</i>) Yellowtail snapper (<i>Pristipomoides auricilla</i>) Opakapaka (<i>P. filamentosus</i>) Yelloweye snapper (<i>P. flavipinnis</i>) Kalekale (<i>P. sieboldii</i>) Gindai (<i>P. zonatus</i>) Lunartail grouper (<i>Variola louti</i>)	<p>Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fathoms, fm).</p> <p>Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)</p>	All slopes and escarpments between 40-280 m (20 and 140 fm)

3.9.3 Vulnerable Marine or Coastal Ecosystems and Potential Effects of the Alternatives

Precious coral resources are scarcely found in the U.S. EEZ around Guam (Grigg and Eldridge 1975), and there is no precious coral fishery currently operating in the territory (WPFMC 2009). All precious coral species in Guam are classified as ECS. Although little is known about the distribution and abundance of precious corals Guam, bottomfish fishing is unlikely to affect these species. Exposure of precious corals to damage from bottomfish fishing activities is limited due to existing Federal regulations that prohibit usage of destructive gears (e.g., trawls, poisons, explosives) that are not subject to change due to the proposed action. In addition to overlapping potential deep water precious coral habitat, the fishery operates in areas that include coral reef ecosystem habitat (e.g., areas shallower than 50 m). As discussed above, the fishery is not known to adversely affect benthic habitats (Section 3.3.3.5 and Section 3.3.4.1).

Fishing activity under the status quo alternative is not expected to change from recent years; therefore, it is unlikely that the fishery would affect vulnerable marine ecosystems such as deep or shallow coral ecosystems under this alternative. Fishing activity under any of the action alternatives is not expected to increase relative to the status quo, and none of the alternatives under consideration would change the way the fishery is conducted with respect to potentially impacting vulnerable marine ecosystems. Considering that the fishery is not expected to change in a way that would impact vulnerable marine ecosystems under any alternative, the fishery is not expected to affect vulnerable marine ecosystems under any alternative, and no adverse impacts are expected to these areas as a result of implementing any alternative.

In summary, none of the alternatives are expected to change the way in which this fishery is conducted regarding the magnitude of impacts on habitats. Also, the alternatives under consideration would not change regulations that are in place to prevent and minimize adverse effects from bottomfish fishing on fish habitat. For these reasons, none of the alternatives considered are expected to lead to substantial physical, chemical, or biological alterations to ocean, coral, or coastal habitats or result in impacts to the marine habitat, including areas designated as EFH, HAPC, or unique areas such as MPAs or deep coral ecosystems.

3.10 Scientific, Historic, Archeological, or Cultural Resources and Potential Effects of the Alternatives

Historical and archaeological resources may be found in Federal waters of Guam in the future, but there are no known districts, sites, highways, structures, or objects that are listed in or eligible for listing in the National Register of Historic Places in the areas that the Federal bottomfish fishery operates. Shipwrecks may exist in areas where the fishery operates, but the fishery is not known to adversely affect shipwrecks. Bottomfish fishermen tend to avoid fishing in, anchoring on, and anchoring near known shipwrecks to avoid losing gear.

Sites with unique scientific resources have not been identified in Guam, apart from those protected as MPAs (Section 3.3.4.2). Fishing is generally restricted in these areas, including fishing for bottomfish, so this fishery would not affect MPAs. NMFS does not expect the proposed rebuilding plan to impact objects or places listed in the National Register of Historical Places as no such areas exist in the U.S. EEZ around Guam. While fishing may occur in areas of potential scientific, cultural, or historical interest, the fishery is not currently known to cause loss or destruction to any such resources, and fishing operations are not expected to significantly change under the implementation any of the alternatives for the proposed rebuilding plan in the absence of complementary management (Sections 2.3 through 2.7). If complementary management is implemented by the Guam Government, the expected changes to fishery operations are not anticipated to change the way the fishery interacts with areas of potential scientific, cultural, or historical interest since the management would typically result in reduced fishing activity. Because management under the action alternatives is not expected to result in changes to the conduct of the fishery that would effect resources of scientific, historic, cultural, or archaeological importance, none of the action alternatives are expected to result in large adverse impacts to these resources.

3.11 Physical Resources and Potential Effects of the Alternatives

There are no known significant impacts to air quality, noise, water quality, view planes, or terrestrial resources from past or current bottomfish fishing activity in Guam. The fishery does not have adverse effects on unique features of the geographic environment, and fishing behavior and effort are not expected to change under any alternative in a manner that would result in effects on physical resources (see Sections 2.3 through 2.7). Given the characteristics of the fishing fleet and the generally offshore nature of the fishing activity, none of the alternatives would result in impacts to air quality, noise, water quality, view planes, or terrestrial resources.

3.12 Fishery Management Administration and Enforcement and Potential Effects of the Alternatives

3.12.1 Fishery Agencies and the Council

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS expects the fishery to continue to catch bottomfish as it has in recent years where ACLs were specified without an in-season AM, and no substantial changes are expected relative to recent catches or fishing activity (Section 2.3.1). The implementation of the same ACL and post-season AM as specified for 2020 through 2022 under Alternative 1 would not affect administration and enforcement because the status quo would be maintained, and there would be no in-season AM that would require additional administrative action or enforcement. Administrative and enforcement activities and costs would not be expected to change under the status quo relative to recent years.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 2, NMFS expects the fishery to harvest slightly or substantially less BMUS relative to status quo alternative, depending on the implementation of complementary management, except in years where the total catch is lower than the recent annual average (e.g., 2017, 2020). It is possible, but not assured, that the fishery would reach the authorized catch of 27,000 lb over the course of the rebuilding plan, which would require that NMFS close Federal waters to bottomfish fishing in accordance with the in-season AM and higher performance standard. If this occurs, a closure of Federal waters would not require an additional rule but would require more administrative resources to close the fishery and enforce the closure, relative to the status quo alternative where a closure would not be implemented due to the lack of an in-season AM. Although this would be the first time an in-season AM would be used in Guam, NMFS has utilized an in-season closure as an AM in the Hawaii Deep 7 bottomfish fishery since 2007. The Deep 7 fishery reached the catch limit each year from 2007 to 2010, so NMFS has experience with this type of action. If the fishery were closed in Guam, NOAA OLE and USCG would be responsible for enforcing the closure. Enforcement of the bottomfish fishing closure in Federal waters would not be difficult because the 3-mile limit is easily determined using the Global Positioning System (GPS). The application of the higher performance standard for subsequent years in the form of a complete Federal closure would similarly require more administrative resources and enforcement effort, but it would not require an additional rule. The development of a new coordinated management approach to allow the reopening of the fishery under the higher performance standard would also require additional administrative resources to generate and implement the measures. The new regulations would not cause substantial costs to fishermen. Fishermen would continue to comply with existing laws, and they would need to learn about the potential for an in-season closure and comply with the no-retention regulation for BMUS caught in Federal waters if a closure is implemented.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Under Alternative 3, NMFS expects the fishery have slightly or substantially reduced catch relative to the status quo alternative, depending on the implementation of complementary

management, as it is likely that annual catches would reach the proposed ACL and result in a closure of the fishery in Federal waters in accordance with the in-season AM and higher performance standard. If this occurs, a closure of Federal waters would not require an additional rule but would require more administrative resources to close the fishery and enforce the closure, relative to the status quo where a closure would not be implemented. Although this would be the first time an in-season AM would be used in Guam, NMFS has experience with this type of action (see Section 3.5.1.2). If the fishery is closed in Guam, NOAA OLE and USCG would be responsible for enforcing the closure. Enforcement of the bottomfish fishing closure in Federal waters would not be difficult because the 3-mile limit is easily determined using GPS. The application of the higher performance standard in subsequent years would similarly require more administrative resources and enforcement effort, but it would not require an additional rule. The development of a new coordinated management approach to allow the reopening of the fishery under the higher performance standard would also require additional administrative resources to generate and implement the measures. The new regulations would not cause substantial costs to fishermen. Fishermen would continue to comply with existing laws, and they would need to learn about the potential for an in-season closure and comply with the no-retention regulation for BMUS caught in Federal waters if a closure is implemented.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, the fishery is expected to perform similarly to the status quo except in years where the total catch is much higher than the recent annual average (e.g., 2011), for which impacts would be dependent on the implementation of complementary management by the territory. It is possible, but less likely than under Alternatives 2 and 3, that the fishery would reach the authorized catch of 31,000 lb over the course of the rebuilding plan, which would require that NMFS close Federal waters to bottomfish fishing. If this occurs, a closure of Federal waters would not require an additional rule but would require more administrative resources to close the fishery and enforce the closure, relative to the status quo where a closure would not be implemented. Although this would be the first time an in-season AM would be used in Guam, NMFS has experience with this type of action (see Section 3.5.1.2). If the fishery is closed in Guam, the NOAA OLE and the U.S. Coast Guard would be responsible for enforcing the closure. Enforcement of the bottomfish fishing closure in Federal waters would not be difficult to enforce because the 3-mile limit is easily determined using GPS. The development of a new coordinated management approach to allow the reopening of the fishery under the higher performance standard would also require additional administrative resources to generate and implement the measures. The new regulations would not cause substantial costs to fishermen. Fishermen would continue to comply with existing laws, and they would need to learn about the potential for an in-season closure and comply with the no-retention regulation for BMUS caught in Federal waters if a closure is implemented.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Under Alternative 5, the fishery would be closed in Federal waters over the course of the rebuilding plan, so it would not be necessary to evaluate catch relative to an ACL and subsequent administrative action by NMFS would not be necessary to close the fishery in accordance with

the in-season AM or develop a new management approach in accordance with the higher performance standard. This alternative would not require more administrative resources than the status quo, but additional resources from the NOAA OLE and the USCG would be needed to enforce a closure of Federal waters to bottomfish fishing. Enforcement of the bottomfish fishing closure in Federal waters would not be difficult because the 3-mile limit is easily determined using GPS. Fishermen would continue to comply with existing laws, and they would need to learn about the Federal closure and comply with the no-retention regulation for BMUS caught in Federal waters if the closure is implemented. Compliance would be easier for fishermen under Alternative 5 compared to the other action alternatives because the closure of Federal waters would not change over the course of the rebuilding plan.

3.12.2 Territorial Management Agency

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

The implementation of the status quo would not change responsibilities for the Guam DAWR to monitor or enforce the bottomfish fishery regardless of whether complementary management is enacted. DAWR would continue to collect catch data through the creel survey and commercial receipt book programs and provide this information to NMFS so they can be reported by the Council in its annual SAFE reports and tracked against the ACL. The status quo would not lead to added burden on territorial management agencies because the management provisions would be the same as previously implemented for the fishery.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard

The use of an ACL, in-season AM, and higher performance standard for the Guam bottomfish fishery under Alternative 2 is not expected to change fishery monitoring by the local resource management agencies. Catch data would continue to be collected by DAWR in collaboration with NMFS and the Council, and DAWR would transfer these data to NMFS. Because of the need for timely data to support an in-season AM, NMFS would coordinate with DAWR to allow it to monitor the fishery and provide data in a timely and effective manner. If complementary management is implemented, there could be additional burdens to territorial management agencies to enact and enforce a closure to the fishery in territorial waters alongside a Federal closure. Thus, implementation of an ACL of 27,000 lb and potential Federal closure would not affect territorial management except if complementary management is implemented. If it is, the territorial management agencies would be responsible for enacting and enforcing a closure in territorial waters.

Alternative 3: Implement a Rebuilding Plan an Annual Catch Limit of 16,299 lb, an In-Season Accountability Measure, and a Higher Performance Standard

Alternative 3 is also not expected to change fishery monitoring by the local resource management agencies under the implementation of an ACL, in-season AM, and higher performance standard. Catch data would continue to be collected by DAWR in collaboration with NMFS and the Council, and DAWR would transfer these data to NMFS. The need for timely data would remain to support the in-season AM, so NMFS would coordinate with DAWR to provide prompt and effective monitoring. If complementary management is implemented, there could be additional burdens to territorial management agencies to enact and enforce a

closure to the fishery in territorial waters alongside a Federal closure. Thus, the implementation of an ACL of 16,299 lb and potential Federal closure would not affect territorial management except if complementary management is implemented. If it is, the territorial management agencies would be responsible for enacting and enforcing a closure in territorial waters.

Alternative 4: Implement a Rebuilding Plan an Annual Catch Limit of 31,000 lb, an In-Season Accountability Measure, and a Higher Performance Standard (Preferred Alternative)

Under Alternative 4, the use of an ACL, in-season AM, and performance is similarly not expected to change fishery monitoring by the local resource management agencies for the Guam bottomfish fishery. Catch data would continue to be collected by DAWR in collaboration with NMFS and the Council, and DAWR would transfer these data to NMFS. The in-season AM would need near real time data to determine the timing of a potential Federal closure, so NMFS would coordinate with DAWR to allow them to conduct effective monitoring and timely transmission of the data to NMFS. If complementary management is implemented, there could be additional burdens to territorial management agencies to enact and enforce a closure to the fishery in territorial waters alongside a Federal closure. Implementation of an ACL of 31,000 lb and potential Federal closure would not affect territorial management except if complementary management is implemented. If it is, the territorial management agencies would be responsible for enacting and enforcing a closure in territorial waters.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

NMFS expects the implementation of a Federal closure under Alternative 5 to have similar effects on DAWR as Alternatives 2, 3, and 4. Although an in-season AM is not part of Alternative 5, DAWR would continue to collect catch interviews from fishermen fishing in territorial waters and transmit the data to NMFS. Similar to the other action alternatives, DAWR would not be required to implement a closure to the bottomfish fishery in territorial waters alongside a Federal closure unless complementary management is implemented by the territory. In this scenario, there would be increased burden on the territorial management agencies to enact and enforce a closure in territorial waters.

3.12.3 Implementation of ACLs and AMs for other Pacific Island Fisheries

The proposed implementation of an ACL, AM, and higher performance standard for the Guam bottomfish fishery would not conflict with or reduce the efficacy of existing bottomfish resource management by any local resource management agency, NMFS, or the Council. Additionally, the proposed management would also not conflict with ACL and AM implementations for the other Western Pacific bottomfish fisheries in the American Samoa or Hawaii because these fisheries are geographically separated and bottomfish fishery participants do not fish in different territories such that management in one island area (e.g., Guam) would adversely affect the stock status of bottomfish in another island area (e.g., American Samoa or Hawaii). However, the proximity of Guam to the CNMI may introduce conflicts associated with the implementation of ACL and AMs for the CNMI. Changes to the management regime for bottomfish in Guam may cause Guam-based fishermen to opt to harvest bottomfish in the waters of the CNMI at an increased rate than is normally known to occur. If bottomfish landed in Guam are harvested in the CNMI, there may be impacts to the bottomfish stock complex in the waters of the CNMI that

would not be collected or represented in fishery-dependent data; this could result in additional impacts to the bottomfish stock complex in the waters of the CNMI that are not captured by the current monitoring scheme for the territory. Thus, landings of bottomfish in Guam from CNMI waters may lead to overrepresentation of catch relative to the Guam BMUS ACL and underrepresentation of catch relative to the CNMI BMUS ACL. However, there are no available data about which fish are harvested in the waters of one territory or the other, only where the fish are landed. Additionally, this will likely only be the case for non-commercial fishermen, as commercial fishermen harvesting bottomfish in CNMI waters require a permit, so there are no large impacts expected on the implementation of ACLs for CNMI due to the proposed action.

3.13 Other Potential Effects

3.13.1 Biodiversity and Ecosystem Function

To date, there have been no identified effects to marine biodiversity and/or ecosystem function from the Guam bottomfish fishery. Bottomfish species are not known to have critical ecosystem roles, such as other tropical species such as parrotfishes or reef-building corals (Bozec et al. 2013; Wild et al. 2011), and the fishery is not known to have large effects on biodiversity or ecosystem function. None of the alternatives under consideration would result in substantial changes to the fishery with respect to gear, effort, or participation, but may cause slight changes in areas fished if Federal waters are closed to the fishery in the absence of complementary management (Sections 2.3 through 2.7). Some of the alternatives could result in changes to the fishery with respect to effort, participation, catch, and areas fished if complementary management is implemented, but would not do so in a way that would create additional impacts to fishery species. Therefore, implementation of the proposed rebuilding plan would not affect marine biodiversity and/or ecosystem function.

Fishing vessels travel between islands in the archipelago, which has the potential for nonnative invasive marine and terrestrial species to spread. Of particular concern to the government and people of the CNMI is the unintentional introduction of the brown tree snake from Guam to the CNMI, and there are programs to prevent such introductions (USGS 2020). However, the proposed alternatives would not change fishing practices in the absence of complementary management. The frequency of Guam vessels traveling to the CNMI may increase as a result of the rebuilding plan if a Federal closure is enacted, and especially if complementary management is implemented alongside the Federal closure, but these vessels are only expected to fish in CNMI waters (e.g., around Rota Banks) and not dock in the northern islands. As a result, the proposed action is unlikely to introduce or spread non-native invasive species.

3.13.2 Highly Uncertain Effects, Unique or Unknown Risks

As authorized by the Magnuson-Stevens Act, the Council and NMFS have managed the bottomfish fishery in Guam since 1986 (WPFMC 1986), and fishery managers and scientists involved in developing the proposed action are highly experienced in terms of understanding the way the fishery operates and the likely outcomes of the proposed measure. An ACL of 27,000 lb with a post-season AM but no in-season AM is being implemented for the fishery from 2020 through 2022, so fishery performance is known under the status quo. The proposed action under the action alternatives is part of continued management of the fishery under a system of ACLs and AMs that was first used in 2012. Effects on the human environment of operation and

management of the fishery under these management measures are generally known and have been considered in the development and recommendation of alternatives.

Analysis of the proposed management action includes consideration of the BSIA and authorized and expected levels of catch. Some uncertainty exists in the potential response of fishermen to a closure of Federal waters in the absence of complementary management since there is no data on the level of displacement from Federal waters to territorial waters that may occur; however, because a small proportion of bottomfish habitat in Guam lies in Federal waters (26.4 percent, see Fig. 1), the difference between the maximum possible effect (i.e., proportional reduction in catch) and minimum possible effect (i.e., no reduction in catch) is relatively small. Notably, NMFS expects either outcome to result in a slight to moderate reduction in catch under the action alternatives compared to the status quo depending on variability in the fishery and displacement of fishing effort without complementary management in place. If complementary management is implemented, uncertainty regarding fishery outcomes could be further diminished because of the higher likelihood for the fishery to adhere to the proposed catch limits with action being taken by the territory to manage the fishery in territorial waters. The effects of continued fishing for BMUS within these constraints for the duration of the rebuilding plan are understood based on the stock assessment and projections by PIFSC SAP and are not highly risky. Risks associated with proposed management are therefore not unique or unknown, and potential outcomes are informed by available scientific information.

3.13.3 Environmental Justice

NMFS considered the effect of the alternatives on environmental justice communities that include members of minority and low-income groups. Overall, the fishery is not having a large adverse effect on subsistence harvests of marine resources or on the environment or human health in a way that disproportionately affects members of environmental justice communities. The fishery does not pollute marine waters and, thus, does not have adverse effects to human health or on marine life. The proposed management would apply to everyone that catches bottomfish, so it would not disproportionately affect any particular subset of the bottomfish fishery. The environmental review in this EA shows that the fishery would continue to be conducted in the same way that it has in recent years under the status quo alternative, that Alternatives 2 through 4 may slightly or substantially decrease catch or remain consistent compared to the status quo, and that Alternative 5 may moderately or completely decrease catch compared to the status quo, depending on the implementation of complementary management by the territory with this Federal action. These alternatives could decrease the amount of bottomfish available to fishing communities, though none of the effects are expected to be substantial in the absence of complementary management (Section 3.4.1). If complementary management is implemented, there could be substantial impacts to Guam fishing communities stemming from the significant reduction of locally sourced bottomfish for subsistence and recreational purposes as well as the reduction of revenues for commercial fishermen. The Federal closure or ACL, AMs, and higher performance standard under the alternatives are intended to prevent overfishing, rebuild the stock, and mitigate impacts to fishing communities, including minority and low-income groups such that communities that rely on BMUS harvest can continue to benefit from the fishery. Because the fishery is not expected to change its conduct substantially under any alternative in the absence of complementary management, implementation of these management measures is not anticipated to result in substantial changes to the fishery, regardless

of which alternative is being considered. However, if complementary management is implemented, substantial impacts could occur. As a result, NMFS and the Council found that adverse effects to the environment that could have disproportionately high or adverse effects on members of environmental justice communities in Guam may occur depending on the implementation of complementary management by the territory with this Federal action.

3.13.4 Potential for Future Precedent

While this is the first rebuilding plan for bottomfish in the Western Pacific region, management under ACLs and AMs is not a new management method. NMFS and the Council have been using ACLs and AMs to manage the region's fisheries since 2012, implementing ACLs for the fisheries in each year except for 2018 and 2019. The implementation of the proposed ACLs, AMs, and higher performance standards would not result in an automatic specification of management beyond the scope of the rebuilding plan. The proposed rebuilding plan is designed to be implemented until the Guam bottomfish stock complex is allowed to rebuild to its B_{MSY} , and the proposed alternatives would not constrain management options available to the Council and NMFS in the future. Thus, the proposed action would not establish a precedent with potential for significant adverse effect or represent a decision in principle about a future consideration.

3.13.5 Climate Change

Although there are no specific studies examining the potential effects of climate change on Pacific Island bottomfish, changes in the environment from global climate change have the potential to affect bottomfish fisheries. Effects of climate change may include sea level rise, increased intensity or frequency of coastal storms and storm surges, changes in rainfall (more or less) that can affect salinity nearshore or increase storm runoff and pollutant discharges into the marine environment, increased temperatures resulting in coral bleaching, and temperature mediated responses in some marine species (IPCC 2007). The effects from climate change may occur slowly and be difficult to discern from other effects. Climate change has the potential to adversely affect some organisms, while others could benefit from changes in the environment. Increased carbon dioxide uptake can increase ocean acidity which can disrupt calcium uptake processes in corals, crustaceans, mollusks, reef-building algae, and plankton, among other organisms (Houghton et al. 2001; The Royal Society 2005; Caldeira and Wickett 2005; Doney 2006; Kleypas et al. 2006). Climate change can also lead to changes in ocean circulation patterns, which can affect the availability of prey, migration, survival, and dispersal (Buddemeier et al. 2004). Damage to coastal areas due to storm surge or sea level rises as well as changes to catch rates, migratory patterns, or visible changes to habitats are among the most likely changes.

The efficacy of the proposed management provisions of the rebuilding plan in providing for sustainable levels of fishing for bottomfish is not expected to be adversely affected by climate change. Recent catches and biological status of the stock complex informed the development of the ACL, AMs, and higher performance standard, and climate change effects, if any, would be indirectly reflected in those statistics. Monitoring of bottomfish catches and stocks would continue, regardless of which alternative is selected, and if environmental factors were found to be affecting the stocks, management could be adjusted in the future.

3.13.5.1 Consideration of Greenhouse Gas Emissions

The Guam bottomfish fishery utilizes vessels that are powered by fossil fuels and emit greenhouse gases from fossil fuel combustion. In the absence of complementary management, the alternatives under consideration would not result in a change in fishing in any way that would have large effects on vessel use or fuel consumption or greenhouse gas emissions. If the fishery were to be subject to a closure of Federal waters to bottomfish fishing, some fishing activity may move from offshore banks in Federal waters to closer habitats in territorial waters that require less transit (Fig. 1). However, NMFS does not have detailed information on the current level of fishing effort in Federal versus territorial waters or the amount of displacement that may occur. The closure would affect a small proportion of bottomfish habitat, so fishing activity is not expected to change substantially relative to the status quo alternative and any potential decreases in fossil fuel consumption are expected to be minor. If complementary management is implemented and a closure of both territorial and Federal waters is applied for the fishery, there may be a substantial or complete reduction in fishing activity that would result in reduced vessel use, fuel consumption, and greenhouse gas emissions if fishermen do not opt to target species other than bottomfish. NMFS does not have information on the potential for fishermen to switch their target species. For these reasons, none of the action alternatives are expected to result in substantial changes to the way vessels are used without complementary management, so there would be no change in greenhouse gas emissions. Under complementary management, there exists a possibility that vessel usage and associated fossil fuel consumption for the fishery would decrease.

Table 20. Environmental effects of the alternatives.

Topic/Section	Alt. 1 – Status Quo	Alt. 2 – ACL of 27,000 lb w/ In-Season AM and Higher Performance Standard	Alt. 3 – ACL of 16,299 lb w/ In-Season AM and Higher Performance Standard	Alt. 4 – ACL of 31,000 lb w/ In-Season AM and Higher Performance Standard	Alt. 5 – Temporary Moratorium of Fishery in Federal Waters
Overview of the alternatives	Existing fishery management as specified for 2020 through 2022 with a 27,000 lb ACL and a post-season AM. No in-season AM and no potential for Federal fishery closure regardless of the implementation of complementary management.	ACL of 27,000 lb, in-season AM, and higher performance standard. Stock would rebuild in five years, or in three to five years, with complementary management. Fishery could be subject to a Federal closure based on recent average catch.	ACL of 16,299 lb, in-season AM, and higher performance standard. Authorized catch levels would rebuild stock in three years, but continued fishing in territorial waters could extend rebuilding to four years. Likely that fishery would be subject to a Federal closure.	ACL of 31,000 lb, in-season AM, and higher performance standard. Authorized catch levels would rebuild stock in nine years. Less likely, but possible, that fishery would be subject to a Federal closure.	Federal waters closed. Stock could rebuild stock in two years with complementary management, but continued fishing in territorial waters would likely extend rebuilding to three years in the. No AMs.
Expected fishery outcome of alternatives	Continuation of fishery as operated. Catch possibly, but not overly likely, to exceed level of OFL, but rebuilding may still occur in five years if catch is consistent with the recent annual average.	Federal fishery may close in December in the first fishing year and be closed until new measures are implemented under the higher performance standard. Fishermen could fish year round in territorial waters where the majority of bottomfish habitat is located in the absence of complementary management.	Federal fishery may close by August in the first fishing year and be closed until new management measures are implemented under the higher performance standard. Fishermen could fish year round in territorial waters where the majority of bottomfish habitat is located in the absence of complementary management.	Fishery expected to continue fishing as in recent years. Possible that Federal fishery would close late in the fishing year during years with high catches. Fishermen could fish year round in territorial waters where the majority of bottomfish habitat is located in the absence of complementary management.	Catch expected to be less than all other alts. Fishermen could fish year round in territorial waters where the majority of bottomfish habitat is located in the absence of complementary management.

<p>Guam bottomfish fishery</p>	<p>No change. Fishing would occur year round. Fishery expected to continue fishing as in recent years, with average annual catch of 27,306 lb. Federal and territorial waters open to fishing with a catch limit but no mechanism to ensure the ACL is not exceeded.</p>	<p>Slight or significant change depending on complementary management. A closure of Federal waters would affect fishermen who customarily fish in Federal waters, but the implementation of complementary management could also impact fishing in territorial waters.</p> <p>There would be a reduction in catch relative to Alt. 1 and 4 if the Federal fishery is closed.</p>	<p>Slight or significant change depending on complementary management. Likely closure of Federal waters would affect fishermen who customarily fish in Federal waters, but the implementation of complementary management could also impact fishing in territorial waters.</p> <p>Reduction in catch relative to Alt. 1, 2, and 4.</p>	<p>Possible change. A potential closure of Federal waters for part of year in years of high catch would affect fishermen who customarily fish in Federal waters, but the implementation of complementary management could also impact fishing in territorial waters in this scenario. Possible reduction in catch relative to the status quo in years of high catch. Potentially more BMUS available than Alt. 2 and 3.</p>	<p>Largest potential change. This may adversely affect fishermen who customarily fish in Federal waters. Fishermen could fish year round in territorial waters.</p>
<p>Fishery operation in terms of location, gear, participation, effort, seasonality</p>	<p>Alt. 1 would not result in a change to the fishery with respect to location, gear, seasonality, participation, or intensity.</p>	<p>Potential slight or significant change to areas fished if fishing displaced into territorial waters in the event of a Federal waters closure without complementary management. Effort likely to be slightly or significantly reduced during the rebuilding plan depending on the implementation of complementary management.</p>	<p>Slight or significant change to areas fished. Some fishing may be displaced into territorial waters if Federal waters close as expected in the absence of complementary management. Effort likely to be slightly or significantly reduced depending on the implementation of complementary management.</p>	<p>No large change to areas fished, but fishing may be displaced into territorial waters if Federal waters close in years of high catch without complementary management. Effort likely to be maintained or slightly or significantly reduced depending on the implementation of complementary management.</p>	<p>Slight or significant change to areas fished. All fishing would occur in territorial waters in the absence of complementary management. Since most fishing occurs in territorial waters, this would not result in a substantially large change. Reduction in effort because of the closure in Federal waters.</p>

Effects on the Physical Environment					
Effects on air and water quality, noise, and view planes	No effect, not considered further.	No change from baseline.	No change from baseline.	No change from baseline.	No change from baseline.
Effects on unique features of the geographic environment	The fishery does not affect unique features of the geographic environment. (Sections 3.2, 3.3.4, and 3.4.2)	No change from baseline.	No change from baseline.	No change from baseline.	No change from baseline.
Effects on Biological Environment					
Estimated annual catch of BMUS in subsequent years	27,306 lb	Between 20,097 lb and 27,306 lb	Between 20,097 lb and 27,306 lb	27,306 lb	Between 20,097 lb and 27,306 lb
Effects on target species (BMUS)	There would not be functional constraints to catch to promote sustainability due to the lack of an in-season AM. Overfishing would not be restricted in years of high catch, and the stock would persist in an overfished state if catches exceed levels of sustainable harvest without impediment.	NMFS would authorize catch at a level that is intended rebuild the stock in five years. Overfishing is expected to be prevented, though risk still exists if complementary management is not implemented.	NMFS would authorize catch at a level that is intended rebuild the stock in three years. Overfishing is expected to be prevented, though risk still exists if complementary management is not implemented. NMFS expects the fishery to rebuild in four years in the absence of complementary management.	Catch would be authorized at a level that is intended rebuild the stock in nine years. Overfishing is expected to be prevented, though risk still exists if complementary management is not implemented for possible years of high catch.	Authorized catch would be functionally equivalent to zero in Federal waters, which is intended to prevent overfishing and rebuild the stock in two years. However, fishing would not be limited in territorial waters without complementary management. Rebuilding is expected in three years due to continued fishing in territorial waters in the absence of complementary management.

Effects on non-target species and bycatch	Fishery effects on non-target stocks are expected to continue at low levels because bottomfish fishing is target-specific, and there has been little bycatch in the fishery in recent years.	No change from baseline.			
Effects on protected species	The fishery has limited interactions with protected species and seabirds and operates within existing ESA and MMPA authorizations.	No change from baseline.			
Effects on critical habitat	There is no critical habitat in the action area, but NMFS has proposed critical habitat for ESA-listed corals.	No change from baseline.			
Effects on habitats and vulnerable ecosystems	The fishery uses hooks and lines and is not known to have adverse effects on habitats including EFH or HAPC, coral reefs, or vulnerable ecosystems.	No change from baseline.			
Effects on other vulnerable marine or coastal ecosystems	The fishery is not known to be adversely affecting other vulnerable coastal ecosystems including deep coral ecosystems.	No change from baseline.			

Effects on the Socioeconomic Setting					
Fishing communities	<p>The affected fishing community is comprised of people from the island of Guam, which includes fishermen, vendors/dealers, and consumers. BMUS are important for recreational and subsistence uses, and the fishery supports jobs and provides revenue for fishermen. No potential change from recent management under this alternative.</p>	<p>Slight to significant impacts. Without complementary management, commercial fishermen would see 0.3 to 26.4 percent reduction in revenue due to the expected closure of Federal waters. There would be a similar reduction in BMUS resources available for the community. Effects on non-commercial, sustenance, and recreational fishing would likely be similar to those for commercial fishing. Fishing in territorial waters would still be available.</p> <p>If complementary management is implemented, the fishery could be prohibited from operating, resulting in a 100 percent decrease of available bottomfish and revenue.</p>	<p>Slight to significant impacts. Without complementary management, commercial fishermen would see a 10.6 to 26.4 percent reduction in revenues due to the expected closure of Federal waters. There would be a similar reduction in BMUS resources available for the community. Effects on non-commercial, sustenance, and recreational fishing would likely be similar. Fishing in territorial waters would still be available.</p> <p>If complementary management is implemented, the fishery could be prohibited from operating, resulting in a 100 percent decrease of available bottomfish and revenue.</p>	<p>Potential impacts. Commercial fishermen would see no change in revenues if the fishery performs consistent with the recent annual average, regardless of the implementation of complementary management. In years of higher than average catch, fishermen may experience a slight to substantial decrease of revenue due to the expected closure of Federal waters, depending on the implementation of complementary management. In this case, there would be a similar reduction in BMUS for the community. Effects on non-commercial, sustenance, and recreational fishing would be similar to commercial fishing.</p>	<p>Moderate to significant impacts. In the absence of complementary management, revenue reduced 26.4 percent for fishermen each year. A similar reduction is expected in BMUS resources available for the community. Effects on non-commercial, sustenance, and recreational fishing would be similar to those for commercial fishing.</p> <p>Fishing in territorial waters would still be available and displacement of effort would partially offset the impacts if a closure is enacted.</p> <p>If complementary management is implemented, the fishery would be prohibited from operating in both territorial and Federal waters, resulting in a 100 percent decrease of available bottomfish and revenue.</p>

Effects on fishery revenue	NMFS expects fishing to continue at levels similar to recent years, and commercial fishermen would realize \$23,033 in total revenue if they catch 27,306 lb and 17.5 percent is sold.	Revenue expected to be slightly less than the baseline at \$16,952 to \$22,964 in the absence of complementary management since catch is expected to be reduced due to a closure of Federal waters if the ACL is reached. If complementary management is implemented, revenue could be substantially decreased to \$0 to \$22,775 due to fishery restrictions in territorial waters.	Revenue expected to be slightly less than the baseline at \$16,952 to \$20,581 in the absence of complementary management since catch is expected to be reduced due to a closure of Federal waters if the ACL is reached. If complementary management is implemented, revenue could be substantially decreased to \$0 to \$13,748 due to fishery restrictions in territorial waters.	Revenue expected to be consistent with the baseline at \$23,033 if the fishery continues to perform at the recent annual average level regardless of the implementation of complementary management.	Revenue expected to be moderately less, at \$16,952 in the absence of complementary management since catch is expected to be reduced due to a closure of Federal waters. If complementary management is implemented, revenue would be decreased to \$0 since the fishery would be prohibited from operating in both territorial and Federal waters.
Effects on public health or safety	The fishery is not causing an adverse effect on public health or safety.	No change from baseline.	No change from baseline.	No change from baseline.	No change from baseline.
Safety at sea	There are no known safety-at-sea issues in the fishery.	No change without complementary management. With complementary management, a race to fish may be fostered under the possibility that Federal waters may be closed.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.

<p>Potential for controversy</p>	<p>There is no potential for controversy from fishermen due the same management being implement as previously for 2020 through 2022.</p>	<p>There may be the potential for controversy with fishermen due to the implementation of a restrictive ACL with a functional constraint in the form of an in-season AM and higher performance standard that could restrict harvest from offshore banks. Further controversy may occur if complementary management is implemented due to the complete restriction of the fishery if the higher performance standard is applied.</p>	<p>Same as Alt. 2.</p>	<p>Same as Alt. 2.</p>	<p>There may be the potential for controversy with fishermen due to the fishing grounds in the offshore banks being completely restricted. This controversy may be greater if complementary management is implemented by the territorial government.</p>
<p>Scientific, historic, archaeological, or cultural resources</p>	<p>The fishery is not known to have an adverse effect on historic, archaeological, or cultural resources.</p>	<p>No change from baseline.</p>	<p>No change from baseline.</p>	<p>No change from baseline.</p>	<p>No change from baseline.</p>

Effects on the Fishery Management Setting					
NMFS management	NMFS would continue to participate in Council activities. Additional administrative costs may be required to implement a post-season overage adjustment.	NMFS would continue to participate in Council activities. Additional administrative costs needed to track in-season catch and implement any Federal fishery closure, as needed.	Same as Alt. 2.	Same as Alt. 2.	Similar to Alternative 2, but no need to track catch.
Council management activities	The Council would continue to review and report annual BMUS catches against the ACL in the annual SAFE report.	No change from baseline.	No change from baseline.	No change from baseline.	No change from baseline.
Territorial management activities	Guam DAWR would continue to administer the commercial receipt and creel survey programs and would continue to enforce fishery related laws in territorial waters and on shore.	No change without complementary management. Guam is not currently proposing to implement a complementary closure for BMUS in territorial waters if the catch attains the ACL. Territorial management agencies are responsible for ensuring that management provisions are applied to territorial waters.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.

Enforcement	NOAA OLE, USCG, and DAWR would continue to enforce fishery regulations around Guam.	Enforcement of any bottomfish closure in Federal waters would not be difficult to enforce because the 3 mile limit is easily determined. Territorial agencies would be responsible for enforcing regulations in territorial waters.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.
Would the action under each alternative be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?	No. The Magnuson-Stevens Act and the Mariana Archipelago FEP require that NMFS implement ACLs and AMs for all MUS annually and this would not change.	No. The proposed rebuilding plan, despite being long-term, is a limited duration action intended rebuild BMUS. This alternative would not narrow future choices having to do with the fishery.	Same as Alt 2.	Same as Alt 2.	Same as Alt 2.
Other potential effects					
3.6.1 Biodiversity and ecosystem function	Other than effects on BMUS stocks, the fishery is not known to be having large adverse effects on biodiversity or ecosystem function.	No change from baseline.	No change from baseline.	No change from baseline.	No change from baseline.

Introduction or spread of invasive species	Not currently occurring as a result of fishery management. Some bottomfish vessels travel from Guam to CNMI but remain within the archipelago.	Guam vessels fishing in CNMI waters may increase, but these vessels are not likely to dock in CNMI or act as a vector for nonnative terrestrial species.	Same as Alt 2.	Same as Alt 2.	Same as Alt 2.
Likelihood the effects on the human environment would be highly uncertain or involve unique or unknown risks	Unlikely. Catches are monitored, and the characteristics of the fishery are known due to a recent stock assessment. The effects of continued fishing for BMUS under an ACL and post-season AM are understood and are not highly risky.	Unlikely. The effects of the proposed action are known due to an understanding of the fishery and a recent stock assessment. The effects of continued fishing for BMUS within the limited constraints of this fishery rebuilding plan are understood and are not highly risky.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.
Environmental justice	Members of minority and low-income groups may be affected but the fishery is not having a large adverse effect on subsistence harvests, the environment, or human health in a way that disproportionately affects members of environmental justice communities.	No change from baseline without complementary management. With complementary management, there exists the possibility for a substantial or complete reduction of available bottomfish resources to the Guam fishing community, which would impact members of environmental justice communities.	Same as Alt. 2	Same as Alt. 2.	Same as Alt. 2

Additional Considerations					
Climate change and greenhouse gases	The fishery requires the use of vessels that are powered by fossil fuels. NMFS does not control the amount of vessel use or where vessels are used by the fishery.	If there is a closure of Federal waters to bottomfish fishing, vessel use could be only slightly reduced or remain the same. If complementary management is implemented, there may be a reduction in vessel activity and greenhouse gas emissions.	Same as Alt. 2	Same as Alt. 2.	Same as Alt. 2

4 REFERENCES

- Allen, S. and P. Bartram. 2008. *Guam as a fishing community*. Pacific Islands Fisheries Science Center, National Marine Fisheries Service, NOAA, Honolulu, HI. PIFSC Administrative Report H-08-01. 61 p.
- Bozec, Y.M., L. Yakob, S. Bejarano, and P.J. Mumby. 2013. "[Reciprocal facilitation and non-linearity maintain habitat engineering on coral reefs.](#)" *Oikos*, 122: 428–440.
- Brodziak, J., J. O'Malley, B. Richards, and G. DiNardo. 2012. *Stock Assessment Update of the Status of Bottomfish Resources of American Samoa, the Commonwealth of the Northern Mariana Islands and Guam, 2010*. NMFS, Pacific Islands Fisheries Science Center, Internal Report IR-12-022. Honolulu, HI. 126 p.
- Buddemeier, R.W., J.A. Kleypas, and R.B. Aronson. 2004. *Coral Reefs and Global Climate Change: Potential Contributions of Climate Change to Stresses on Coral Reef Ecosystems*. Pew Center on Global Climate Change. Arlington, VA. 56 p.
- Caldeira, K. and M.E. Wickett. 2005. "[Ocean model predictions of chemistry changes from carbon dioxide emissions to the atmosphere and ocean.](#)" *Journal of Geophysical Research*, 110 (C09S04).
- Doney, S.C. 2006. "The dangers of ocean acidification." *Scientific American*, 294(3): 58–65.
- Eldredge, L.G. 2003. "The marine reptiles and mammals of Guam." *Micronesica*, 35-36: 653-60.
- Grigg, R.W. and L.G. Eldredge. 1975. *The commercial potential of precious corals in Micronesia. Part —The Mariana Islands*. University of Guam, Marine Laboratory Tech. Rep. 18. Sea Grant Publication UGSG-75-01. 16 p.
- Guam Division of Aquatic and Wildlife Resources (DAWR). 2006. *Guam Comprehensive Wildlife Conservation Strategy*. Guam Department of Agriculture, Division of Aquatic and Wildlife Resources. 214 p. + Appendices.
- Houghton, J.T., Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, and D. Xiaosu (Eds.) 2001. [IPCC Third Assessment Report: Climate Change 2001: The Scientific Basis](#). Cambridge University Press, Cambridge, UK, 944 p. [Also see: Summary for Policymakers and Technical Summary, 98 p.]
- IPCC (Intergovernmental Panel on Climate Change). "[2007: Summary for Policymakers.](#)" *In*: Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller (Eds.) *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge. United Kingdom and New York. 18 p.

- Kelley, C. and W. Ikehara. 2006. "The impacts of bottomfishing on Raita and West St. Rogatien Banks in the Northwestern Hawaiian Islands." *Atoll Research Bulletin*, 543: 305–317.
- Kelley, C., and R. Moffit. 2004. *The impacts of bottomfishing on the Raita and West St. Rogatien Reserve Preservation Areas in the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve*. Unpublished report, Hawaii Undersea Research Laboratory. Honolulu, HI. 49 p.
- Kleypas, J.A., R.A. Feely, V.J. Fabry, C. Langdon, C.L. Sabine, and L.L. Robbins. 2006. *Impacts of Ocean Acidification on Coral Reefs and Other Marine Calcifiers: a Guide for Future Research*. Report of a workshop sponsored by the National Science Foundation, National Oceanic and Atmospheric Administration, and the U.S. Geological Survey. 88 p.
- Langseth, B., J. Syslo, A. Yau, and F. Carvalho. 2019. *Stock assessments of the bottomfish management unit species of Guam, the Commonwealth of the Northern Mariana Islands, and American Samoa, 2019*. NOAA Technical Memorandum, NMFS-PIFSC-86. 165 p. + supplement. doi:[10.25923/bz8b-ng72](https://doi.org/10.25923/bz8b-ng72).
- Martell, S. 2019. *Benchmark Stock Assessments for the Bottomfish Management Unit Species of American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam in 2019*. Report prepared for the Pacific Islands Fisheries Science Center, NOAA/NMFS Pacific Islands Regional Offices, NOAA/NMFS, and Western Pacific Fishery Management Council. 6 p.
- Miller, M.H. and C. Klimovich. 2016. *Endangered Species Act Status Review Report: Giant Manta Ray (Manta birostris) and Reef Manta Ray (Manta alfredi)*. Report to National Marine Fisheries Service, Office of Protected Resources. Silver Spring, MD. 128 p.
- Myers, R.F. 1997. *Assessment of coral reef resources of Guam with emphasis on waters of federal jurisdiction*. Report prepared for the Western Pacific Fishery Management Council. 21 p.
- NMFS (National Marine Fisheries Service). 2002. *Endangered Species Act Section 7 Consultation on the Fishery Management Plan for the Bottomfish and Seamount Groundfish Fisheries in the Western Pacific Region*. NMFS, Sustainable Fisheries Division, Southwest Region, Pacific Islands Area Office. Honolulu, HI. 66 p.
- NMFS. 2008. Letter of concurrence. *Endangered Species Act Section 7 consultation on bottomfish and coral reef fisheries of the Marianas Archipelago*. NMFS, Pacific Islands Regional Office, Honolulu HI.
- NMFS. 2009. *Biological Opinion. Continued authorization of pelagic troll and handline fisheries, as managed under the fishery management plan for pelagic fisheries of the western Pacific region*. NMFS Pacific Islands Region, Protected Resources Division. 31 p.

- NMFS. 2015. *Biological Evaluation. Potential Impacts of Mariana Archipelago Coral Reef, Bottomfish, Crustacean, and Precious Coral Fisheries on Reef-Building Coral and Indo-West Pacific Scalloped Hammerhead Shark Distinct Population Segment*. NMFS, Pacific Islands Region, Sustainable Fisheries Division. Honolulu, HI. 48 p.
- NMFS. 2017. *Environmental Assessment Specification of 2016-2017 Annual Catch Limits and Accountability Measures for American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands Bottomfish Fisheries*. NMFS, Pacific Islands Region. Honolulu, HI. 124 p.
- NMFS. 2018. *Designation of Critical Habitat for the Endangered Main Hawaiian Islands Insular False Killer Whale Distinct Population Segment: Biological Report*. Biological Report, NMFS, Pacific Islands Region, Protected Resources Division. Honolulu, HI. 73 p.
- NMFS. 2019a. *Biological Evaluation: Potential Effects of Bottomfish Fisheries in American Samoa, Guam and Northern Mariana Islands on Oceanic Whitetip Shark, Giant Manta Ray, and Chambered Nautilus*. NMFS, Pacific Islands Region. Honolulu, HI. 33 p.
- NMFS. 2019b. *Endangered Species Act Section 7 Consultation on the Continued Operation of bottomfish fisheries of American Samoa, Guam and the Northern Mariana Islands - Section 7(a)(2) and 7(d) Determinations; Likelihood of Jeopardy and Commitment of Resources during Consultation*. NMFS, Pacific Islands Region. Honolulu, HI. 14 p.
- NMFS. 2020a. *Section 7(a)(2) and 7(d) Extension. Determinations on the continued operation of bottomfish fisheries of American Samoa, Guam, and the Northern Mariana Islands under Section 7 of the ESA*. NMFS PIRO, Honolulu, HI, August 11, 2020. 12 pp.
- NMFS. 2020b. *Section 7(a)(2) and 7(d) Extension. Determinations on the continued operation of bottomfish fisheries of American Samoa, Guam, and the Northern Mariana Islands under Section 7 of the ESA*. NMFS PIRO, Honolulu, HI, December 15, 2020. 12 pp.
- Randall, R.H., R.T. Tsuda, R.S. Jones, M.J. Gawel, J.A. Chase, and R. Rechebei. 1975. *Marine Biological Survey of the Cocos Barrier Reefs and Enclosed Lagoon*. University of Guam Marine Laboratory Technical Report 17. 160 pp.
- Royal Society, The. 2005: *Ocean Acidification Due to Increasing Atmospheric Carbon Dioxide*. The Royal Society, London, 60 p.
- Tremblay-Boyer, L., F. Carvalho, P. Neubauer, and G. Pilling. 2019. *Stock assessment for oceanic whitetip shark in the Western and Central Pacific Ocean*. WCPFC-SC15-2019/SA-WP-06. Report to the WCPFC Scientific Committee. Fifteenth Regular Session, 12-20 August 2018, Pohnpei, Federated States of Micronesia.
- USGS. 2020. Press release. *USGS Brown treesnake research continues at Guam National*

Wildlife Refuge. Office of Communications and Publishing, Reston, VA.

- Wild, C., O. Hoegh-Guldberg, M.S. Naumann, M.F. Colombo-Pallotta, M. Ateweberhan, W.K. Fitt, R. Iglesias-Prieto, C. Palmer, J.C. Bythell, J.C. Ortiz, Y. Loya, and R. van Woesik. 2011. "[Climate change impedes scleractinian corals as primary reef ecosystem engineers.](#)" *Marine and Freshwater Research*, 62(2): 205–215. doi:10.1071/mf10254.
- Wiles, G.J. 2003. "A checklist of birds recorded in Guam's marine habitats." *Micronesica* 35–36: 665–679.
- WPFMC (Western Pacific Fishery Management Council). 1986. *Fishery Management Plan for Bottomfish and Seamount Fisheries of the Western Pacific Region*. Western Pacific Fishery Management Council. Honolulu, Hawaii. 314 p.
- WPFMC. 2002. *Supplements to Amendment 6 to the Bottomfish and Seamount Groundfish Fishery Management Plan, Amendment 10 to the Crustaceans Fishery Management Plan, and Amendment 4 to the Precious Corals Fishery Management Plan*. Western Pacific Regional Fishery Management Council. Honolulu, Hawaii.
- WPFMC. 2009. *Fishery Ecosystem Plan for the Mariana Archipelago*. Western Pacific Fishery Management Council. Honolulu, Hawaii. 231 p.
- WPFMC. 2011. *Omnibus Amendment for the Western Pacific Region to Establish a Process for Specifying Annual Catch Limits and Accountability Measures*. Western Pacific Fishery Management Council. Honolulu, Hawaii. 123 p. + Appendices.
- WPFMC. 2015. *Guam P* Working Group Meeting Report*. Western Pacific Fishery Management Council. Honolulu, Hawaii 96813. 13 p.
- WPFMC. 2020a. *Annual Stock Assessment and Fishery Evaluation Report for the Mariana Archipelago Fishery Ecosystem Plan 2019*. Remington, T., Sabater, M., Ishizaki, A. (Eds.) Western Pacific Fishery Management Council. Honolulu, Hawaii. 204 p. + Appendices.
- WPFMC. 2020b. *Guam P* Working Group Meeting Report*. Western Pacific Fishery Management Council. Honolulu, Hawaii 96813. 8 p.
- WPFMC. 2020c. *Guam SEEM Working Group Meeting Report*. Western Pacific Fishery Management Council. Honolulu, Hawaii 96813. 4 p.
- WPFMC. 2021. *Annual Stock Assessment and Fishery Evaluation Report for the Mariana Archipelago Fishery Ecosystem Plan 2020*. Remington, T., Sabater, M., Ishizaki, A. (Eds.) Western Pacific Fishery Management Council. Honolulu, Hawaii.
- WPFMC and NMFS. 2007. Amendment 14 to the Fishery Management Plan for Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region, including a final

supplemental environmental impact statement, regulatory impact review, an initial regulatory flexibility analysis. Honolulu, HI.

Yau A., M. Nadon, B. Richards, J. Brodziak, and E. Fletcher. 2016. *Stock assessment updates of the bottomfish management unit species of American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam in 2015 using data through 2013*. NOAA Technical Memorandum, NMFS-PIFSC-51. 54 p. doi:[10.7289/V5PR7T0G](https://doi.org/10.7289/V5PR7T0G).

APPENDIX A – DRAFT PROPOSED REGULATIONS

For the reasons set out in the preamble, NMFS proposes to amend 50 CFR part 665 as follows:

PART 665 -- FISHERIES IN THE WESTERN PACIFIC

1. The authority citation for 50 CFR part 665 continues to read as follows:

Authority: 16 U.S.C. 1801 et seq.

2. In § 665.405, add paragraphs (g) and (h) to read as follows:

§ 665.405 Prohibitions

* * * * *

(g) Fish for or possess any Mariana Bottomfish MUS as defined in § 665.401 in the Guam Management Subarea after a closure of the fishery in violation of § 665.409(d).

(h) Sell or offer for sale any Mariana Bottomfish MUS as defined in § 665.401 in the Guam Management Subarea after a closure of the fishery in violation of § 665.409(e)

3. Revise § 665.408 to read as follows:

§ 665.408 CNMI Annual Catch Limits (ACL) and Annual Catch Targets (ACT)

(a) In accordance with § 665.4, the ACL and ACT for Mariana bottomfish MUS in the CNMI Management Subarea for each fishing year is as follows:

Table 1 to paragraph (a)

	2021	2022	2023
ACL (lb)	84,000	84,000	84,000
ACT (lb)	78,000	78,000	78,000

(b) If the average catch of the three most recent years exceeds the specified ACL in a fishing year, the Regional Administrator will reduce the ACL and the ACT for the subsequent year by the amount of the overage in a separate rulemaking.

4. Add § 665.409 to read as follows:

§ 665.409 Guam Annual Catch Limits (ACL)

(a) In accordance with § 665.4, the ACL for Mariana bottomfish MUS in the Guam Management Subarea is 31,000 lb.

(b) When NMFS projects the ACL will be reached, the Regional Administrator shall publish a document to that effect in the **Federal Register** and shall use other means to notify permit holders. The document will include an advisement that the fishery will be closed, beginning at a specified date that is not earlier than seven days after the date of filing the closure notice for public inspection at the Office of the **Federal Register**, through the end of the fishing year in which the catch limit is reached.

(c) If the ACL is exceeded in any fishing year, the Regional Administrator shall publish a document to that effect in the **Federal Register** and shall use other means to notify permit holders. The document will include an advisement that the fishery will be closed, beginning at a specified date that is not earlier than seven days after the date of filing the closure notice for public inspection at the Office of the **Federal Register**. The fishery will remain closed until such time that a coordinated approach to management is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild or the rebuilding plan is modified based on the best scientific information available.

(d) On and after the date the fishery is closed as specified in paragraphs (b) or (c) of this section, fishing for and possession of Mariana bottomfish MUS is prohibited in the Guam Management Subarea, except as otherwise authorized by law.

(e) On and after the date the fishery is closed as specified in paragraphs (b) or (c) of this section, sale, offering for sale, and purchase of any Mariana bottomfish MUS caught in the Guam Management Subarea is prohibited.

APPENDIX B – REGULATORY IMPACT REVIEW

1. Introduction

This is a regulatory impact review (RIR) prepared under Executive Order (E.O.) 12866, “Regulatory Planning and Review.” The regulatory philosophy of E.O.12866 stresses that, in deciding whether and how to regulate, agencies should assess all costs and benefits of all regulatory alternatives and choose those approaches that maximize the net benefits to the society. To comply with E.O. 12866, the National Marine Fisheries Service (NMFS) prepares an RIR for regulatory actions that are of public interest. The RIR provides an overview of the problems, policy objectives, and anticipated impacts of regulatory actions. The regulatory philosophy of E.O. 12866 is reflected in the following statement:

In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Further, in choosing among alternative regulatory approaches, agencies should select those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages, distributive impacts; and equity), unless a statute requires another regulatory approach.

This RIR is for the proposed implementation of a rebuilding plan for the Guam bottomfish multi-species stock complex in Guam.

2. Problem Statement and Management Objective

The purpose of this action is to establish a rebuilding plan for the Guam bottomfish complex in order to end overfishing and rebuild the stock complex as required under the Magnuson-Stevens Act. In February 2020, NMFS notified the Council that the Guam bottomfish stock complex was overfished. Under the proposed action, NMFS would implement a rebuilding plan for the Guam bottomfish fishery consistent with Magnuson-Stevens Act Section 304(e) and implementing regulations at 50 CFR 600.310(j). The management objective would be to provide management oversight, prevent overfishing, and to bolster the long-term sustainability of fishery resources while allowing fishery participants to continue to benefit from their use.

3. Description of the Fisheries

More details on the Guam bottomfish fishery can be found in the 2019 and 2020 Annual Stock Assessment and Fishery Evaluation (SAFE) Reports for the Mariana Archipelago Fishery Ecosystem Plan as well as Section 3.1 and 3.3 of the Environment Assessment (EA) associated with this action.

The Guam bottomfish fishery consists of the shallow water component and deep water component, with an estimated 300 or more participants. The shallow water component is likely

larger than the deep water component in terms of catch and effort due to the lower expense and ease of fishing close to shore. Smaller fishing vessels (< 25 ft in length), which comprise a majority of Guam bottomfish fishing fleet, tend to target shallow-water bottomfish species for recreational, subsistence, and small-scale commercial purposes, while the few relatively large vessels in the fishery target the deep water complex at offshore banks and primarily fish for commercial reasons. Fishermen sometimes combine bottomfish fishing with other methods of harvest such as trolling, spearing and jigging, and many commercial fishermen supplement their bottomfish fishing effort with trolling for pelagic fish. Guam's bottomfish fishery is highly seasonal with fishing effort higher during the summer months. It is likely that some fishing vessels that harvest bottomfish banks around Guam land their catches in CNMI. Though bottomfish fishing has only accounted for 10 to 15 percent of Guam's long-term boat-based fisheries harvest, bottomfish hold fundamental dietary and cultural importance for the people of Guam. Annual catch from 2012 to 2020 ranged from 11,711 lb (2015) to 31,760 lb (2019) with annual catch from 2018 to 2020 averaging 27,306 lb. In terms of revenue and pounds sold, for most recent years, this information is confidential, with so few dealers or vendors reporting sales. During 2011-2020, this information is only available for 2017 (15,864 lb caught and 4,002 lb sold) and 2018 (31,226 lb caught, 3,028 lb sold). With 25.2 percent of bottomfish catch sold in 2017 and 9.7 percent in 2018, the analyses in the Environmental Assessment used the average of the percent of catch sold over each of those two years (17.5 percent) as a proxy for percent of catch sold. Percent of catch sold over those two years was slightly less (14.9 percent).

The Guam bottomfish fishery has been managed with annual catch limits (ACL) and accountability measures (AM) since 2012. Catch from both territorial waters and Federal waters count towards the ACL, however, the existing data reporting systems does not specify how much bottomfish catch comes from territorial versus Federal waters. The fishery has never reached the ACL, and was considered to be harvesting sustainably until the 2019 stock assessment.

4. Description of the Alternatives

This section briefly describes the alternatives for the Guam bottomfish rebuilding plan. Sections 2.3, 2.4, 2.5, 2.6, and 2.7 of the EA provides more details on each alternative. Given that Guam is not likely to implement a complementary closure in territorial waters if a Federal catch limit is reached, each alternative assumes that bottomfish fishing would only close in Federal waters as the result of the enactment of an in-season AM and performance standard.

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Alternative 1 would maintain the status quo of the 2020-2022 ACLs and AM. These consist of ACLs of 27,000 lb each fishing year and a post-season AM to reduce the ACL in the subsequent fishing year by the amount of overage if the three-year running average of catch exceeds the ACL for the preceding fishing year. There would be no in-season AM to prevent the ACL from being exceeded.

Alternative 2: Implement an Annual Catch Limit of 27,000 lb ACL, an In-Season AM, and Higher Performance Standard

Under Alternative 2, NMFS would implement an ACL of 27,000 lb, which would be the same as the ACL under status quo, with an in-season closure of bottomfish fishing in Federal waters around Guam upon reaching the ACL as an AM. NMFS would use catch data collected by local resource management agencies to estimate catch and track progress of catches from both Federal and territorial waters towards the ACL. As an additional performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb ACL, an In-Season AM, and Higher Performance Standard

Under Alternative 3, NMFS would implement an ACL of 16,299 lb, which would be lower than the ACL under status quo, with an in-season closure of bottomfish fishing in Federal waters around Guam as an AM. NMFS would use catch data collected by local resource management agencies to estimate catch and track progress of catches from both Federal and territorial waters towards the ACL. As an additional performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb ACL, an In-Season AM, and Higher Performance Standard (Council Preferred)

Under Alternative 4, NMFS would implement an ACL of 31,000 lb, which would be higher than the ACL under status quo, with an in-season closure of bottomfish fishing in Federal waters around Guam as an AM. NMFS would use catch data collected by local resource management agencies to estimate catch and track progress of catches from both Federal and territorial waters towards the ACL. As an additional performance standard, if the ACL is exceeded during any fishing year over the course of the rebuilding plan, NMFS would close the fishery in Federal waters until a coordinated management approach is developed and regulations are implemented that ensures catch in both Federal and territorial waters can be maintained at levels that allow the stock to rebuild.

Alternative 5: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around Guam

Alternative 5 would be equivalent to setting an ACL of 0 lb in Federal waters around Guam. Fishing for and possessing bottomfish in Federal waters around Guam would be prohibited until it is determined that the stock complex is no longer experiencing overfishing and has been rebuilt. There would be no AMs or performance standard associated with this alternative because catch would not need to be monitored towards an ACL and the fishery would only be able to reopen once the Guam bottomfish stock has been rebuilt.

5. Analysis of Alternatives

This section describes potential economic effects and evaluates the impacts of the action alternative relative to the status quo alternative. The analyses of impacts assumes that the Guam Government would not implement a complementary closure of territorial waters, which contains an estimated 73.6% of bottomfish habitat. This would likely result in the movement of some, if not most, bottomfish fishing activity to territorial waters upon closure of Federal waters. Commercial sales data for Guam bottomfish are confidential for 2019 and 2020 due to the limited number of vendors reporting, so revenue information was based on 2017 and 2018 revenue data. More details can be found in Sections 3.1, 3.3, and 3.4 of the EA.

Alternative 1: Status Quo / NMFS would not implement a Rebuilding Plan

Under Alternative 1, NMFS expects the Guam bottomfish fishery to continue fishing in a pattern similar to recent years. NMFS would apply the same ACL implemented for the fishery in 2020 through 2022. This alternative would implement an authorized limit below both the OFL and MSY but provide no in-season mechanism to restrict catch from exceeding the 27,000 lb ACL, and therefore Alternative 1 would not functionally constrain bottomfish fishing activity in Guam or adversely affect the fishing communities. Non-commercial fishing (inclusive of recreational, sustenance, and cultural fishing) would likely also be unaffected relative under Alternative 1.

Based on 2017 and 2018 reported catch and revenue information, Council anticipates that commercial fishermen would sell around 17.5 percent of their catch. At the price of \$4.82 per lb, expected revenue would be \$23,035. Using the estimated number of at least 300 fishery participants (2021 List of Fisheries; 86 FR 3028, January 14, 2021), each fisherman would earn approximately \$77. This alternative would not functionally constrain bottomfish fishing activity in Guam, so it is not expected to adversely affect the fishing communities in the territory. Non-commercial fishing (inclusive of recreational, sustenance, and cultural fishing) would likely also be unaffected.

Alternative 2: Implement a Rebuilding Plan with an Annual Catch Limit of 27,000 lb, an In-Season AM, and a Higher Performance Standard

Under Alternative 2, , the expected catch could be lower than compared to status quo, based on recent annual average catch that is slightly higher than the ACL. Using the recent average annual catch of 27,306 lb and assuming that catch is consistent throughout the year, catch could exceed the ACL toward the end of the year, with a remaining 306 lb that would have been caught had the in-season closure not been in place. Assuming that the proportion of bottomfish habitat in Federal and territorial waters (26.4 and 73.6 percent respectively) reflect the proportion of catch, an estimated 81 lb that might have ordinarily been caught in Federal waters would not be caught in the first year that the fishery reaches the ACL (if fishing effort in Federal waters does not relocate to territorial waters). Given the in-season AM, while the fishery could close earlier in the year in Federal waters under Alternative 2 compared to Alternative 1, overall expected annual catch would actually depend on whether fishing effort that would have occurred in Federal waters moves to territorial waters once closure occurs.

If the fishery exceeds the ACL in any year of the rebuilding plan, the fishery would be subject to the higher performance standard until a method of restricting fishing mortality at the level needed to rebuild bottomfish stock in the target time frame. This would close bottomfish fishing in Federal waters throughout the year. Without complementary closure in territorial waters, and assuming bottomfish catch reflected the proportion of bottomfish habitat in Federal and territorial waters, annual catch of bottomfish is expected to be 20,097 lb, or 7,209 lb less than the amount that would have been caught under status quo. If fishermen who would have fished in Federal waters, relocate fishing effort to territorial waters, then total catch would be higher but still likely to be lower than status quo. Given the in-season AM, fishery participants may also decide to moderate bottomfish fishing effort to avoid reaching the ACL and the subsequent multi-year fishery closure. If complementary measures are implemented in territorial waters, expected catch could exceed the ACL in the first year, and then catch would be 0 lb for every subsequent year (i.e., a closure in both Federal and territorial waters) until the higher performance standard is no longer required.

With regard to revenue, when bottomfish fishing is open in both Federal and territorial waters, expected catch is 27,225 lb and roughly 17.5 percent of that catch is sold at \$4.82 for a total of \$22,964. Compared to the status quo, there would be an expected fishery-wide revenue loss of \$341, or just over \$1 per fishery participant. For subsequent years of the rebuilding plan if the higher performance standard is triggered, with an expected catch of 20,097 lb, there would be an expected loss of revenue of \$6,081, or over \$20 per fishery participant, if fishermen do not transfer effort to territorial waters. The revenue loss would be less if fishery participants who would have fished in Federal waters decided to relocate fishing effort to territorial waters, which are likely to remain open or if they sell a greater portion of their catch.

Alternative 2 could constrain non-commercial catch relative to previous years, although the extent to which that occurs depends on how much bottomfish fishing activity would transfer to territorial waters upon closure in Federal waters. However, NMFS lacks detailed information on whether catch for commercial or non-commercial purposes comes disproportionately from territorial or Federal waters or the proportions of species that are caught in these waters. Overall, it is expected that the amount of fish caught for sustenance and cultural purposes would be affected similarly to fish caught for commercial purposes, in that there might be a slight decrease in non-commercial catch.

Overall, implementation of Alternative 2 is expected to change the Guam bottomfish fishery slightly relative to the status quo during the time frame of the rebuilding plan due to the in-season AM. The fishery is not expected to substantially change the way it fishes with respect to fishing gear, fishing effort, participation, or intensity, but may change slightly with respect to total catch and areas fished, with the fishermen who would normally choose to fish in Federal waters being affected more adversely. Larger impacts would occur if the Guam Government implemented a complementary closure in territorial waters.

Alternative 3: Implement a Rebuilding Plan with an Annual Catch Limit of 16,299 lb ACL, an In-Season AM, and Higher Performance Standard

Under Alternative 3, the expected catch could be lower than when compared to status quo, based on recent annual average catch that is much higher than the ACL. Using the recent average annual catch of 27,306 lb and assuming that catch is consistent throughout the year, catch could exceed the ACL midyear. Assuming that the proportion of bottomfish habitat in Federal and territorial waters (26.4 and 73.6 percent respectively) reflect the proportion of catch, an estimated 2,906 lb that might have ordinarily been caught in Federal waters would not be caught in the first year that the fishery reaches the ACL (if fishing effort in Federal waters does not relocate to territorial waters) and catch expected to be 24,400 lb with continued fishing in territorial waters. Given the in-season AM, while the fishery could close earlier in the year in Federal waters under Alternative 3 compared to Alternative 1, overall annual catch would actually depend on whether fishing effort that would have occurred in Federal waters moves to territorial waters once closure occurs. Given the in-season AM, fishery participants may also decide to moderate bottomfish fishing effort to avoid reaching the ACL and the subsequent multi-year fishery closure.

If the fishery exceeds the ACL in any year of the rebuilding plan, the fishery would be subject to the higher performance standard until a method of restricting fishing mortality at the level needed to rebuild bottomfish stock in the target time frame. This would close Federal waters throughout the year to the bottomfish fishery; however, NMFS expects there to still be 20,097 lb caught from territorial waters. If complementary measures are implemented in territorial waters, expected catch could exceed the ACL in the first year, and then the catch would be 0 lb for every subsequent year (i.e., a closure in both Federal and territorial waters) until the higher performance standard is no longer required.

With regard to revenue, when bottomfish fishing is open in both Federal and territorial waters, if catch were 24,400 lb and roughly 17.5 percent of that catch is sold at \$4.82 for a total of \$20,581, there would be an expected fishery-wide revenue loss of \$2,452, or \$8 per fishery participant, compared to status quo. For subsequent years of the rebuilding plan under the application of the higher performance standard, with an expected catch of 20,097 lb, there would be an expected loss of revenue of \$6,081, or \$20 per fishery participant, if fishermen do not transfer effort to territorial waters. The revenue loss would be less if fishery participants who would have fished in Federal waters decided to relocate fishing effort to territorial waters, which are likely to remain open or sell a greater portion of their bottomfish catch.

Alternative 3 could constrain non-commercial catch relative to previous years, although NMFS lacks detailed information on whether catch from Federal and territorial waters is ultimately sold or retained for non-commercial purposes. If reduced revenue as a result of the closure of Federal

waters leads fishermen to sell catch that had originally been intended as non-commercial catch, this could further constrain non-commercial catch.

Overall, implementation of Alternative 3 is expected to change the Guam bottomfish fishery moderately relative to the status quo during the time frame of the rebuilding plan due to the in-season AM and the higher performance standard. The fishery is not expected to substantially change the way it fishes with respect to fishing gear, fishing effort, participation, or intensity, but may change with respect to total catch and areas fished, with the fishermen who would normally choose to fish in Federal waters being affected more adversely. Larger impacts would occur if the Guam Government implemented a complementary closure in territorial waters.

Alternative 4: Implement a Rebuilding Plan with an Annual Catch Limit of 31,000 lb ACL, an In-Season AM, and Higher Performance Standard (Council Preferred)

Under Alternative 4, bottomfish catch is unlikely to exceed the ACL in any given year, but could exceed the ACL at some point during the time frame of the rebuilding plan. Over the past ten years, catch had exceeded 31,000 lb three times. Implementing a higher ACL would make it less likely that the fishery would be subject to a multi-year higher performance standard in subsequent years. Given the in-season AM, fishery participants may also decide to moderate bottomfish fishing effort to avoid reaching the ACL and the subsequent multi-year fishery closure.

If the fishery exceeds the ACL in any year of the rebuilding plan, the fishery would be subject to the higher performance standard until a method of restricting fishing mortality at the level needed to rebuild bottomfish stock in the target time frame. This would close Federal waters throughout the year to the bottomfish fishery; however, NMFS expects there to still be 20,097 lb caught from territorial waters.

While complementary measures are unlikely to be implemented in territorial waters, if they were, expected bottomfish catch is expected to be 31,000 lb the first year that the fishery reaches ACL, the 0 lb for every subsequent year until the higher performance standard is no longer required.

With regard to revenue, when bottomfish fishing is open in both Federal and territorial waters, expected catch is 27,603 lb and roughly 17.5 percent of that catch is sold at \$4.82 for a total of \$23,283. For subsequent years of the rebuilding plan under the application of the higher performance standard, with an expected catch of 20,097 lb, the fishery would face an expected loss of revenue of \$6,081, or over \$20 per fishery participant, if fishermen do not transfer effort to territorial waters. The revenue loss would be less if fishery participants who would have fished in Federal waters decided to relocate fishing effort to territorial waters, which are likely to remain open or sell a greater portion of their bottomfish catch.

Alternative 4 is not likely to constrain non-commercial catch relative to previous years given that the ACL would be set higher than recent catch levels. If the ACL is exceeded and the higher performance standard is implemented for subsequent years, non-commercial catch will likely decrease, although NMFS lacks detailed information on whether catch from Federal and territorial waters is ultimately sold or retained for non-commercial purposes. If reduced revenue

as a result of the closure of Federal waters leads fishermen to sell catch that had originally been intended as non-commercial catch, this could further constrain non-commercial catch.

Overall, implementation of Alternative 4 is expected not to change the Guam bottomfish fishery relative to the status quo during the time frame of the rebuilding plan due to the in-season AM, although if the fishery reaches the ACL, the fishery could change slightly relative to status quo, as described in Alternatives 2 and 3. The fishery is not expected to substantially change the way it fishes with respect to fishing gear, fishing effort, participation, or intensity, but may change slightly with respect to total catch and areas fished, with the fishermen who would normally choose to fish in Federal waters being affected more adversely. Larger impacts would occur if the Guam Government implemented a complementary closure in territorial waters.

Alternative 5: Temporary Moratorium on Bottomfish Fishing in Federal Waters

Under Alternative 5, with a moratorium on bottomfish fishing in Federal waters, the level of bottomfish catch would be expected to be 20,097 lb in the absence of complementary management in territorial waters and with no displacement of fishing effort into territorial waters after Federal closure is enacted. The expected catch would depend on the level of fishing activity that would transfer to territorial waters with the closure of bottomfish fishing in Federal waters. If complementary measures are implemented in territorial waters, bottomfish fishermen would not be allowed to catch bottomfish until the stock is rebuilt.

Based on the recent catch and sales information, NMFS anticipates that an average of 17.5 percent of bottomfish catch would be sold. Using the recent average price of \$4.82 per lb, the estimated annual fleetwide bottomfish revenue under Alternative 5 could be as low as \$16,952 and fishery participants would earn roughly \$57 each if divided equally.

Alternative 5 would constrain non-commercial catch and the amount of bottomfish available to the community relative to previous years, although the extent to which that occurs depends on how much bottomfish fishing activity would transfer to territorial waters due to the closure to bottomfish fishing in Federal waters. However, NMFS lacks detailed information on whether catch for commercial or non-commercial purposes comes disproportionately from territorial or Federal waters or the proportions of species that are caught in these waters. Overall, it is expected that the amount of fish caught for sustenance and cultural purposes would be affected similarly to fish caught for commercial purposes, in that there might be a slight decrease in non-commercial catch.

6. Determination of Significant Regulatory Action

Pursuant to E.O. 12866, a regulation is considered a “significant regulatory action” if it is expected to result in: (1) an annual effect of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in this executive order. Based on the information provided above, this regulatory action was determined to not be economically significant for the purposes of E.O. 12866.

APPENDIX C - BOTTOMFISH PROJECTIONS BY PIFSC

See PDF

APPENDIX D - GUAM P* AND SEEM WORKING GROUP REPORTS

See PDF