WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

PRELIMINARY DRAFT

Options Paper for the Rebuilding Plan for the American Samoa Bottomfish Fishery

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Abstract

The Western Pacific Regional Fishery Management Council (Council) proposes to implement a rebuilding plan for the American Samoa bottomfish fishery. When the National Marine Fisheries Service (NMFS) determines that a fishery managed under a fishery management plan is overfished or experiencing overfishing, the Magnuson Fishery Conservation and Management Act (MSA) Section 304(e) and implementing regulations at 50 CFR 600.310(j) require the Council to develop a long-term plan to end overfishing and rebuild the fishery. The Council is required implement this rebuilding plan within two years of notification of a fishery in an overfished condition or experiencing overfishing, and the Council must submit the plan to NMFS within 15 months to allow for sufficient time for implementation. The plan must specify a time for rebuilding that is as short as possible and not exceeding 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.

A new benchmark stock assessment produced by NMFS Pacific Islands Fisheries Science Center (PIFSC) using data through 2017 showed that the American Samoa multi-species bottomfish complex, which harvests bottomfish management unit species (BMUS), is overfished and experiencing overfishing. In response to the results of the assessment, at its 180th meeting in Pago Pago, American Samoa, the Council requested that NMFS take action on behalf of the Secretary of Commerce to reduce overfishing for 2020 using interim measures while the Council develops a plan to end overfishing and rebuild the stock. Here, a range of alternative management measures are presented to the Council pursuant to MSA requirements to implement a rebuilding plan for the American Samoa bottomfish fishery. The options for the Council to consider are: no action (i.e., the status quo), temporary closure of the American Samoa bottomfish fishery in Federal waters for 10 years (2021-2030), implementing an annual catch limit (ACL) of 1,500 lb for the next 10 years with an in-season accountability measure (AM) for NMFS to close the fishery in Federal waters if the ACL is exceeded (i.e., the preferred option), and implementing this ACL and AM alongside Federal permitting, reporting, and bag limits. The preferred option is intended adjust catch levels of the American Samoa bottomfish fishery to mitigate some of the short-term economic and cultural impacts to associated fishing communities while preventing further adverse effects to the fish stock relative to the status quo option.

The preferred option was developed using biomass projections for the American Samoa bottomfish stock that show that the shortest possible time it would take to rebuild stock biomass to its maximum sustainable yield (B_{MSY}) would be 10 years for catch levels between 0 and 1,500 lb. Because the time to rebuild the stock would be the same in the absence of fishing as it would with an annual catch of 1,500 lb, the preferred option sets the American Samoa BMUS ACL at 1,500 lb such that the stock can reach its B_{MSY} by 2030 while allowing a small amount of bottomfish catch. Bottomfish catches from both territorial waters and Federal waters around American Samoa would be counted towards the catch limit. As an accountability measure, NMFS would monitor the fishery and close the Federal waters around American Samoa to bottomfish fishing if the ACL is exceeded. However, it is not expected that the territory would implement a complementary closure of territorial waters. If the preferred option is selected, the Council will develop a draft environmental assessment to evaluate potential environmental effects of the provisions of the proposed rebuilding plan compared to the status quo.

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List of Acronyms and Abbreviations

ABC – Acceptable Biological Catch
ACL – Annual Catch Limit
AM – Accountability Measure
ASAC – American Samoa Administrative Code
BSIA – Best Scientific Information Available
BMUS – Bottomfish Management Unit Species
CFR – Code of Federal Regulations
CNMI – Commonwealth of the Northern Mariana Islands
DMWR – American Samoa Department of Marine and Wildlife Resources
EA – Environmental Assessment
ECS – Ecosystem Component Species
EEZ – Exclusive Economic Zone
FEP – Fishery Ecosystem Plan
FMP – Fishery Management Plan
FR – Federal Register
ICL – Interim Catch Limit
lb – Pounds
LOF – List of Fisheries
MFMT – Maximum Fishing Mortality Threshold
MPA – Marine Protected Area
MSA – Magnuson-Stevens Fishery Conservation and Management Act
MSST – Minimum Stock Size Threshold
MSY – Maximum Sustainable Yield
MUS – Management Unit Species
NEPA – National Environmental Policy Act
nm – Nautical miles
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
OFL – Overfishing Limit
P* - Probability or Risk of Overfishing
PIFSC – NMFS Pacific Islands Fisheries Science Center
PIRO – Pacific Islands Regional Office
RIR – Regulatory Impact Review
SAFE report - Stock Assessment and Fishery Evaluation report
SDC – Status Determination Criteria
SEEM – Social, Economic, and Ecological Considerations, or Management Uncertainty
SSC – Scientific and Statistical Committee
WPacFIN – Western Pacific Fisheries Information Network
WPRFMC or Council – Western Pacific Regional Fishery Management Council
WPSAR – Western Pacific Stock Assessment Review

1 INTRODUCTION

1.1 Background Information

The Western Pacific Fishery Management Council (Council) was established in 1976 under the Magnuson Fishery Conservation and Management Act (MSA) 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. From the late 1970's through 2009, the Council managed fisheries throughout the Western Pacific Region under separate taxonomic-based fishery management plans (FMPs), including the Bottomfish and Seamount Groundfish FMP (WPRFMC, 1986). These FMPs were reorganized into archipelagic fishery ecosystem plans (FEPs) in 2009, including the FEP for the American Samoa Archipelago (WPRFMC, 2009).

The bottomfish fishery in American Samoa (hereafter, the fishery) primarily harvests bottomfish management unit species (BMUS), an assemblage or complex of species that include emperors, snappers, groupers, and jacks (Table 1). As authorized by the MSA, the National Marine Fisheries Service (NMFS) and the Council manage the BMUS fishery in Federal waters (i.e., the U.S. Exclusive Economic Zone, or EEZ) around American Samoa in accordance with the American Samoa FEP, as amended, and implementing regulations at Title 50 Code of Federal Regulations, Part 665 (50 CFR 665). The American Samoa FEP and amendments are available at the Council's website.

Table 1. List of BMUS in American Samoa.

Scientific Name	Common Name(s)	Family
Aphareus rutilans	Red snapper, silvermouth, lehi	Lutjanidae
Aprion virescens	Gray snapper, jobfish	Lutjanidae
Caranx lugubris	Black trevally, jack	Carangidae
Etelis carbunculus	Red snapper, ehu	Lutjanidae
Etelis coruscans	Red snapper, onaga	Lutjanidae
Lethrinus rubrioperculatus	Redgill emperor	Lethrinidae
Lutjanus kasmira	Blueline snapper	Lutjanidae
Pristipomoides filamentosus	Pink snapper, paka	Lutjanidae
Pristipomoides flavipinnis	Yelloweye snapper	Lutjanidae
Pristipomoides zonatus	Flower snapper, gindai	Lutjanidae
Variola louti	Lunartail grouper, lyretail grouper	Serranidae

The American Samoa bottomfish fishery has been managed by the Council since 1986, when the fishery had a significant commercial component with a maximum of 50 vessels landing over 100,000 pounds of bottomfish annually and accounting for nearly half of total catch of the territory's commercial fisheries (Levine and Allen, 2009; WPRFMC, 2020a). In 1988, bottomfish fishing in American Samoa began to decline as skilled commercial fishermen shifted focus from bottomfish to trolling and small-scale longlining for pelagic species, especially albacore (WPRFMC, 2020a). Currently, the American Samoa bottomfish fishery is relatively

small and primarily non-commercial, but it is still of importance to the local economy as well as from socio-cultural and food security standpoints (WPRFMC, 2009; WPRFMC, 2020a). Since 2012, the Council and NMFS have managed the American Samoa bottomfish fishery with annual catch limits (ACLs) and accountability measures (AMs) for the BMUS. The ACLs and AMs were designed to prevent overfishing and ensure the fishery was sustainably managed (see WPFMC, 2011). In no prior year has the American Samoa bottomfish fishery attained or exceeded the ACL, and up until the most recent stock assessment in 2019, the fishery was considered to be harvesting BMUS sustainably (Yau et al., 2016; NMFS, 2017).

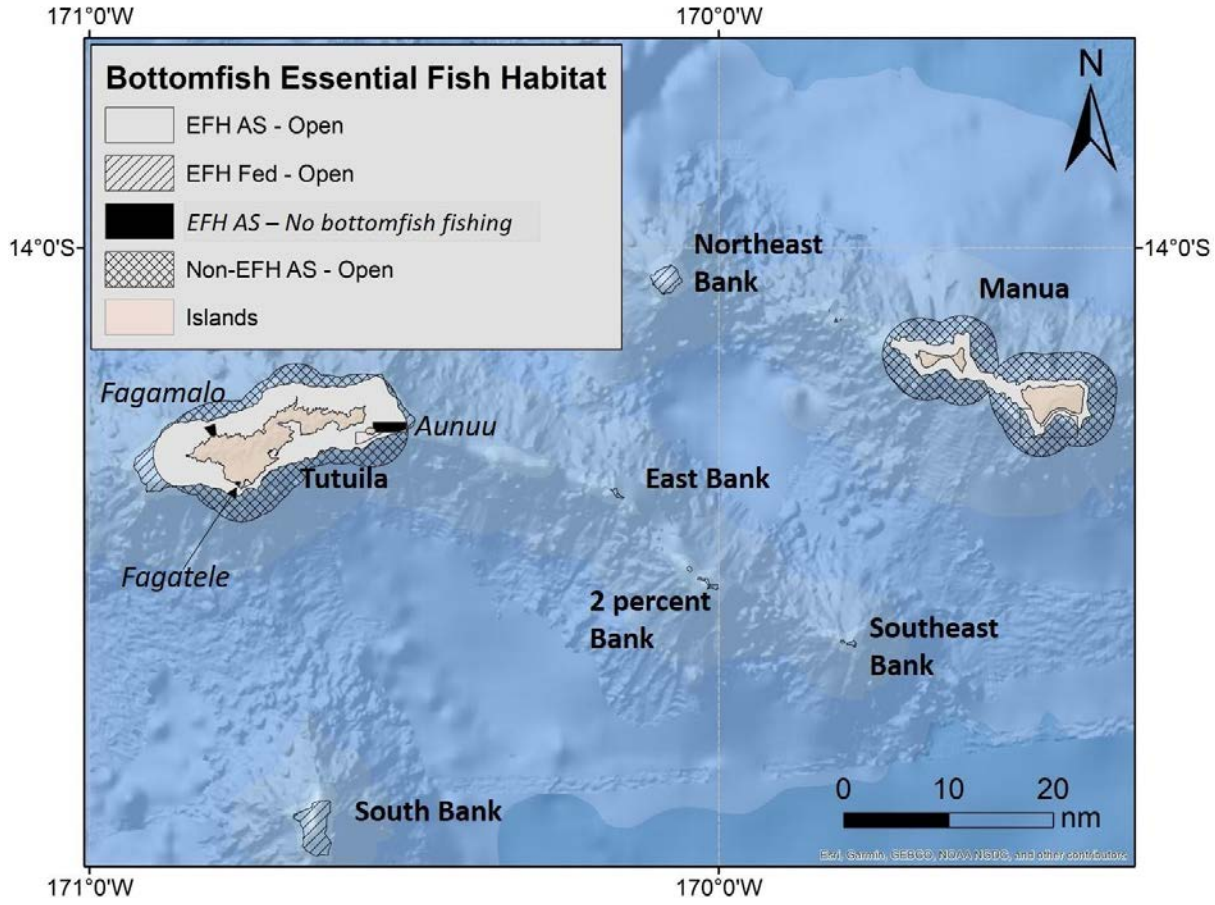

Figure 1. Map of Essential Fish Habitat (EFH) for bottomfish around American Samoa in Federal (Fed) and territorial (AS) waters.

Bottomfish habitat is found in both Federal and territorial waters (Figure 1), and while commercial and non-commercial fisheries for bottomfish occur primarily in nearshore waters, some fishermen make longer trips to specific offshore bank areas (Brodziak et al., 2012). Habitat in these banks is primarily deepwater habitat where red snappers (e.g. *Etelis* spp. and *Pristipomoides* spp.), rather than reef-associated bottomfish, are caught. Catch from both territorial waters (generally, 0–3 nm from shore) and Federal waters (the EEZ) is counted towards the ACLs. As shown in Figure 1, the majority of bottomfish habitat is in territorial waters (85 percent), and the rest is in Federal waters (15 percent), primarily located west of Tutuila. Existing data reporting systems do not provide quantitative estimates of how much

bottomfish catch comes from territorial versus Federal waters, and it is not possible to estimate catch of individual species from specific banks or fishing grounds.

1.2 Stock Assessment Findings and Implications

In August 2019, 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 was conducted as a benchmark, indicating that all components of the assessment analyses were re-evaluated by PIFSC and several changes were made relative to previous assessments of the American Samoa bottomfish fishery. The assessment results revealed that the bottomfish stock harvested in American Samoa is subject to overfishing and is overfished based on the stock status determination criteria (SDC) specified in the American Samoa FEP (WPRFMC, 2009). This is the first assessment that indicated the stock is overfished or subject to overfishing.

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[1], 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[2] (Langseth et al. 2019). Based on information contained in the 2019 assessment (Table 2), the average catch of American Samoa BMUS for the most recent five year period of data included (2013–2017) was 21,139 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 and 2019 are available in the Council's Stock Assessment and Fishery Evaluation (SAFE) Report for the American Samoa Archipelago (WPRFMC, 2020a) but are not directly comparable. The assessment information estimated the long-term maximum sustainable yield (MSY) in the fishery at an annual catch of 28,800 lb (Table 3). However, overfishing probability projection values for 2020 through 2025 (i.e., through the terminal year of the assessment) show that the level of catch associated with a 50 percent probability of overfishing is only 8,000 lb of BMUS annually through 2025 (see Table 20 in Langseth et al., 2019). Therefore, to end overfishing in the fishery, the 2019 assessment projection results indicate total catch of BMUS in American Samoa must be limited to no more than 8,000 lb in each calendar year. This overfishing limit (OFL) is currently 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).

The stock assessment findings were presented by PIFSC to the Council at its 180th meeting on October 22-24, 2019 in Pago Pago, American Samoa (84 FR 53685, October 8, 2019), and showed that BMUS in American Samoa are overfished and undergoing overfishing. As required

[1] On February 8, 2019, NMFS implemented the Council's recommendation to modify the lists of species in American Samoa, the CNMI, Guam, and Hawaii that are included as BMUS (84 FR 2767). Some species were reclassified as ecosystem component species (ECS) because they were not targeted, were a minor component of the fishery, and were not in need of management. The 2019 stock assessment analyzed the revised stock complexes. In American Samoa, this reduced the number of species in the stock complex from 17 to 11 (Table 1).

[2] This type of fishery production model is used to assess the biomass and exploitation level of marine populations in situations where age and size information are unavailable. It assumes that population growth, which translates to yield or production, is greatest at an intermediate level of biomass. The excess production at this point is the maximum sustainable yield.

under National Standard 2 of the MSA (50 CFR 600.315), the 2019 assessment was subjected to an independent review by a panel of independent fishery science experts (i.e., a Western Pacific Stock Assessment Review, or WPSAR), who 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 WPSAR panel reports and the peer-reviewed benchmark stock assessment were received by the Council's Scientific and Statistical Committee (SSC) at its 134th meeting on October 15-17, 2019 in Honolulu, Hawaii. Though the SSC expressed its concerns regarding the impacts of the data used for the stock assessment of its results, it endorsed the stock assessment for management purposes.

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

Year	BMUS Catch (lb)
2000	23,913
2001	42,301
2002	31,657
2003	21,039
2004	17,622
2005	14,541
2006	15,569
2007	22,359
2008	32,965
2009	40,446
2010	11,978
2011	24,569
2012	7,688
2013	19,740
2014	20,532
2015	29,511
2016	20,181
2017	15,913
Recent (five-year) Average	**21,139**

(Source: Langseth et al., 2019)

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 National Standard 2. On February 6, 2020, NMFS determined that the American Samoa bottomfish stock is overfished and subject to overfishing. On February 10, 2020, the NMFS Pacific Islands Regional Office (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 end overfishing and to implement a plan to rebuild the stock within two years as stipulated by the MSA.

In response to the assessment results and notification from NMFS, at its 180th meeting in Pago Pago, American Samoa, the Council requested that NMFS implement an interim measure to reduce overfishing consistent with provisions of Section 304(e)(6) of the MSA. The Council noted that immediately ending overfishing (i.e., limiting total BMUS catch to 8,000 lb) is expected to result in severe economic and cultural impacts to community members who use bottomfish resources for commercial, subsistence, religious, and cultural purposes. Therefore, the Council requested that the interim measure include a catch limit that reduces overfishing while increasing biomass in 2020. NMFS submitted a draft environmental assessment on August 20, 2020, with a preferred alternative for a 13,000 lb interim catch limit (ICL) and in-season AM to close the fishery in Federal waters if this ICL was exceeded. The level of 13,000 lb for the ICL was selected by PIFSC using estimates of the maximum level of catch that would allow BMUS biomass to increase in calendar years 2020 and 2021 from the surplus production model in the 2019 benchmark stock assessment. This action to implement a rebuilding plan for the American Samoa bottomfish fishery will be enacted in place of these interim measures.

1.3 MSA Criteria for Rebuilding Overfished Fisheries

Pursuant to Section 304(e)(2) of the MSA 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 MSA 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 a FMP, plan amendment, or proposed regulations for the fishery within two years to end overfishing and rebuild affected stocks, and Council actions should 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 a FMP or plan amendment and any accompanying regulations to stop overfishing and rebuild affected stocks of fish within nine months as indicated by MSA 304(e)(5).

Section 304(e)(4) of the MSA and implementing regulations at 50 CFR 600.310(j)(3) state that any FMP, plan amendment, or proposed regulation prepared by a Council pursuant to MSA 304(e)(3) or 304(e)(5) must specify a time period for rebuilding the fishery that is as short as possible and 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. If T_{min} exceeds 10 years, then T_{max} can be calculated with one of the following methods:

i. T_{min} plus the length of time associated with one generation time for the stock, where "generation time" is the average length of time between when an individual is born and the birth of its offspring;

ii. The amount of time the stock is expected to take to rebuild to B_{MSY} if fished at 75 percent of the Maximum Fishing Mortality Threshold (MFMT); or

iii. T_{min} multiplied by two.

When T_{min} exceeds 10 years, T_{max} is the maximum time for rebuilding linked to the biology of the stock. A Council and its SSC should consider all relevant biological data and its uncertainties when selecting a method for determining T_{max}, and rationale must be provided for the decisions based on BSIA. 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}, and the fishing mortality associated with achieving T_{target} is known as $F_{rebuild}$.

Additionally, pursuant to Section 304(e)(4) of the MSA and implementing regulations at 50 CFR 600.310(j)(3), the 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.

As required by MSA 304(e)(7) and implementing regulations at 50 CFR 600.310(j)(3)(iv), 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.

1.4 Purpose and Need

The purpose of this proposed action is to establish a FEP amendment with an ACL and AMs appropriate to end overfishing in the American Samoa bottomfish fishery and rebuild the American Samoa bottomfish stock complex from its overfished designation to the extent possible around American Samoa as required by MSA 304(e)(3). Consistent with the provisions of the MSA and implementing regulations at 50 CFR 600.310(j)(2), the need for this action is to end overfishing as identified by the most recent stock assessment (Langseth et al., 2019) and rebuild the American Samoa bottomfish stock complex from the overfished condition designated in the stock assessment. Because the Council was notified by NMFS that the American Samoa bottomfish stock complex is overfished and subject to overfishing on February 10, 2020, the Council must submit the plan amendment to NMFS within 15 months from that notification (i.e., by May 2021). The action to end overfishing and rebuild the stock must be implemented within two years (i.e., by February 2022). Additionally, pursuant to MSA 304(3)(4) and implementing regulations at 50 CFR 600.310(j)(3), the amendment must specify the time period for rebuilding

the fishery that is as short as possible and not exceeding 10 years as well as the fishing mortality rate to achieve rebuilding the stock within this time frame.

1.5 Action Area

The fishery management area for the American Samoa FEP bottomfish fishery includes the EEZ around American Samoa. However, the action area also encompasses those areas in which fishing for BMUS occurs in territorial and Federal waters of American Samoa (Figure 1). Bottomfish fishing primarily occurs in waters from the surface to 230 m depth around the islands and offshore banks of American Samoa, including Tutuila, Aunuu, and the Manua Islands (i.e., Tau and Ofu-Olosega) approximately 54 nm east of Tutuila. As of June 3, 2013, commercial fishing is prohibited in Rose Atoll Marine National Monument (78 FR 32996), which is approximately 80 nm east of Tau. The fishery does not fish in areas closed to fishing around the islands of Tutuila and Aunuu, which include several community and territorial marine protected areas (MPAs), including at Fagamalo, and several National Marine Sanctuary Management Areas (Figure 1). Including those designated by the American Samoa Community-Based Management Program (pursuant to the American Samoa Administrative Code, or ASAC, § 24.1001 through 24.1029), MPAs occupy approximately 35,203 km^2 of across 27 sites in the territory (Raynal et al., 2016), though many of them are nearshore.

1.6 Public Review Process and Involvement

The Council convenes 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. Public comment, including both oral and written statements, are accepted by the Council on its agenda items for the meeting.

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 American Samoa 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. At the 180th Council meeting where the Council discussed issues associated with ACLs and AMs for American Samoa BMUS, public discussion focused on the implications of the findings of the 2019 benchmark stock assessment and their validity. Bottomfish fishermen from American Samoa expressed concerns that the data from creel surveys and the commercial receipt program collected by the American Samoa Department of Marine and Wildlife Resources (DMWR) in collaboration with PIFSC and used for the stock assessment are not representative of the fishery despite these being the only data available to use in stock assessments. Fishermen also noted that there are only a small number of fishermen active in the fishery (fewer than 30 according to the 2020 List of Fisheries, or LOF).

In addition to concerns about available catch data, bottomfish fishermen and Council members from American Samoa expressed concerns about the economic, social, and cultural effects of a implementing a catch limit much lower than recent catch levels and of a closure of the bottomfish fishery in Federal waters. Those concerns were reflected in the Council's request for an interim action, which was sent to NMFS on November 1, 2019. NMFS submitted a draft environmental assessment on August 20, 2020 with a preferred alternative (i.e., 13,000 lb ICL

and in-season AM) to provide balance between the regulatory requirements to reduce overfishing and the needs of the fishery and associated communities for continued access to bottomfish to the degree allowed by BSIA and Federal regulations regarding interim actions. In a letter to NMFS on June 15, 2020, the American Samoa DMWR indicated that they opposed the proposed ICL and AM, and that they would not implement complementary management measures.

At the Council's 182nd meeting held virtually on June 23-25, 2020, there was a preliminary presentation on the development of the bottomfish rebuilding plan for American Samoa. The meeting was open to the public, which was notified through the *Federal Register* (85 FR 34420, June 4, 2020) and the Council's website. Discussion between PIFSC staff and the Council on this agenda item during the public comment period focused on addressing concerns from Council members regarding the improvement of American Samoa's bottomfish data and stock assessment prior to the next benchmark stock assessment scheduled for 2023. PIFSC staff emphasized that there may be new sources of data used for the next benchmark stock assessment. The Council will take initial action on the American Samoa bottomfish rebuilding plan at its 184th meeting on December 2-4, 2020, which is also open to the public, utilizing information in this options paper.

2 DESCRIPTION OF ALTERNATIVES

2.1 Development of the Alternatives

The alternatives considered in this document were developed by the Council, pursuant to MSA requirements, in response to the notification by NMFS PIRO that the American Samoa bottomfish fishery is overfished and is experiencing overfishing. Four alternatives were generated to evaluate a range of management options from a baseline of no Federal action (Alternative 1) to the maximum Federal action possible (closing the bottomfish fishery in Federal waters, Alternative 3). The preferred alternative (Alternative 2) would close the American Samoa bottomfish fishery in Federal waters when the annual catch reaches 1,500 lb, which would end overfishing and rebuild the fishery within 10 years. Another alternative (Alternative 4) evaluates the impacts to the fishery and community of implementing bag limits alongside Federal permitting and reporting. These alternatives are described in detail and evaluated below.

The initial phase of alternative development and consideration of their effects on the fishery is the comparison of stock status against measures of overfishing and overfished status, which is done in stock assessments performed by PIFSC. Under the Council's FEP for American Samoa (WPRFMC, 2009), overfishing of bottomfish occurs when the fishing mortality rate (F) exceeds the fishing mortality rate for maximum sustainable yield (F_{MSY}) for one year or more; this is the MFMT and is expressed as a ratio, $F/F_{MSY} = 1.0$. Thus, if the F/F_{MSY} ratio exceeds 1.0 for one year or more, overfishing is occurring. A stock is a considered to be overfished when its biomass (B) declines below the level necessary to produce MSY on a continuing basis (B_{MSY}), which is when $B \leq (1\text{-}M)*B_{MSY}$, where M is the natural mortality of the stock. 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. If possible, SDC of MFMT and MSST are applied to individual species within the multi-species stock complex. Alternatively, when that is not possible, SDC are applied to indicator species for the multi-species stock complex. Current fishery data does not have the resolution to allow the use of either approach for bottomfish in American Samoa, therefore the Council and NMFS apply SDC to the entire bottomfish multi-species complex as prescribed in the American Samoa FEP (WPRFMC, 2009). Both the 2015 (Yau et al., 2016) and 2019 (Langseth et al., 2019) stock assessments used the same approach of evaluating bottomfish as a multi-species stock complex.

Development of the preferred alternative (Alternative 2) began with estimation of the OFL for the American Samoa bottomfish fishery from the benchmark stock assessment (see Section 2.1.1.1). The Council's SSC accepted the benchmark stock assessment at its 134th meeting in October 2019 and recommended the Council convene its Risk of Overfishing Analysis (P*) and Social, Ecological, Economic, and Management (SEEM) Uncertainty working groups. The Council held a P* working group to quantify the scientific uncertainty associated with the stock assessment and lower the MSY-based OFL to specify the Acceptable Biological Catch (ABC). The Council did not hold a SEEM working group, which usually results in the implementation of a buffer to lower the ABC to an ACL, due to scheduling issues associated with COVID-19. Regardless, the P* working group noted the social, economic, and ecological importance of the

bottomfish fishery but also that a further reduction in the ACL is not warranted because the proposed ACL is so low that additional reduction would not retain sufficient catch for the fishery in Federal waters. Additionally, the Council's American Samoa Advisory Panel suggested setting the ACL to the ABC for this rebuilding plan, as this would provide the highest level of catch without the fishery being subject to overfishing and allow the stock to rebuild incrementally. The suggestions of the P * working and advisory groups combined with analysis of recent catch averages and future projections for the American Samoa bottomfish fishery resulted in the provisions of Alternative 2, which are detailed in alongside additional information on this alternative in Section 2.4.

2.1.1 Summary of American Samoa Bottomfish Fishery Information

2.1.1.1 Estimation of the Overfishing Limit

The 2019 benchmark stock assessment for American Samoa bottomfish (Langseth et al., 2019) provided the estimate for the long-term MSY for the stock at 28,800 lb (95%CI = 16,400-55,900 lb), which is lower than the estimate of MSY in the previous stock assessment update for American Samoa bottomfish (Yau et al., 2016). Results of projected probabilities of overfishing for American Samoa 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 and indicated that an ACL set at 8,000 lb would result in a 50 percent probability of overfishing in 2021 through 2025 (Table 3). Therefore, 8,000 lb is considered to be the OFL proxy for this six-year period for the fishery despite the long-term MSY estimate of 28,800 lb. The average catch of American Samoa BMUS from 2017 to 2019 was 12,614 lb (Table 5), which exceeds the OFL by nearly 58 percent. There have been two years (i.e., 2012 and 2013) since ACLs were implemented in 2012 that annual catch did not exceed the OFL of 8,000 lb. The standing stock biomass in 2025 associated with this OFL is 122,400 lb with a harvest rate of 6 percent in 2025, and the probability that the stock would be overfished in that year is 64 percent (see Table 19 in Langseth et al., 2019).

Table 3. Projected probabilities of overfishing for American Samoa BMUS in fishing years 2020 to 2025 for a range of annual catch (in 1000 lb).

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	0	0	0	0	0	0	0.26	1	1	1	1	2	2
0.02	0	0	0	0	0	0	0.27	1	1	1	1	2	2
0.03	0	0	0	0	0	0	0.28	1	1	1	2	2	2
0.04	0	0	0	0	0	0	0.29	1	1	1	2	2	2
0.05	0	0	0	0	0	0	0.30	1	1	2	2	2	3
0.06	0	0	0	0	0	0	0.31	1	1	2	2	2	3
0.07	0	0	0	0	0	0	0.32	1	1	2	2	3	3
0.08	0	0	0	0	0	0	0.33	1	2	2	2	3	3
0.09	0	0	0	0	0	0	0.34	1	2	2	3	3	3
0.10	0	0	0	0	0	0	0.35	1	2	2	3	3	4
0.11	0	0	0	0	0	0	0.36	1	2	2	3	3	4
0.12	0	0	0	0	0	0	0.37	2	2	3	3	4	4
0.13	0	0	0	0	0	0	0.38	2	2	3	3	4	4
0.14	0	0	0	0	0	0	0.39	2	2	3	3	4	4
0.15	0	0	0	0	0	0	0.40	2	3	3	4	4	5
0.16	0	0	0	0	0	0	0.41	2	3	3	4	4	5
0.17	0	0	0	0	0	1	0.42	2	3	3	4	5	5
0.18	0	0	0	0	1	1	0.43	2	3	4	4	5	6
0.19	0	0	0	0	1	1	0.44	3	3	4	5	5	6
0.20	0	0	0	1	1	1	0.45	3	3	4	5	6	6
0.21	0	0	1	1	1	1	0.46	3	4	4	5	6	6
0.22	0	0	1	1	1	1	0.47	3	4	5	5	6	7
0.23	0	0	1	1	1	1	0.48	3	4	5	6	6	7
0.24	0	1	1	1	1	2	0.49	3	4	5	6	7	7
0.25	0	1	1	1	1	2	0.50	4	5	5	6	7	8

(Source: Langseth et al. 2019)

2.1.1.2 Stock Status

In 2017, the most recent year that was taken into account in the stock assessment for American Samoa bottomfish, $H_{2017}/H_{CR} = 2.75$ where H is the harvest rate, indicating overfishing is occurring, while $B_{2017}/B_{MSY} = 0.38$, indicating that the stock is overfished (Langseth et al., 2019; Table 4). The results of the production model used in the assessment showed that there were several years from 1982 to 2017 where the American Samoa bottomfish fishery was not overfished nor experiencing overfishing, but in the terminal year of the analysis, the stock is both overfished and experiencing overfishing (Figure 2).

In 2019, the most recent year for which catch data are available for American Samoa BMUS through the Council's Annual SAFE Report for the American Samoa Archipelago (WPRFMC, 2020a), the total estimated annual catch was 11,093 lb from boat-based creel surveys, while the estimated commercial catch from DMWR commercial receipt invoices was 1,402 lb (Table 5). The difference between the total estimated creel survey catch and estimated commercial catch is assumed to be the non-commercial component of the fishery. The estimated three-year average catch (2017 to 2019) from boat-based creel surveys was 12,614 lb, which exceeds the OFL determined by the stock assessment for the bottomfish fishery (see Section 2.1.1.1).

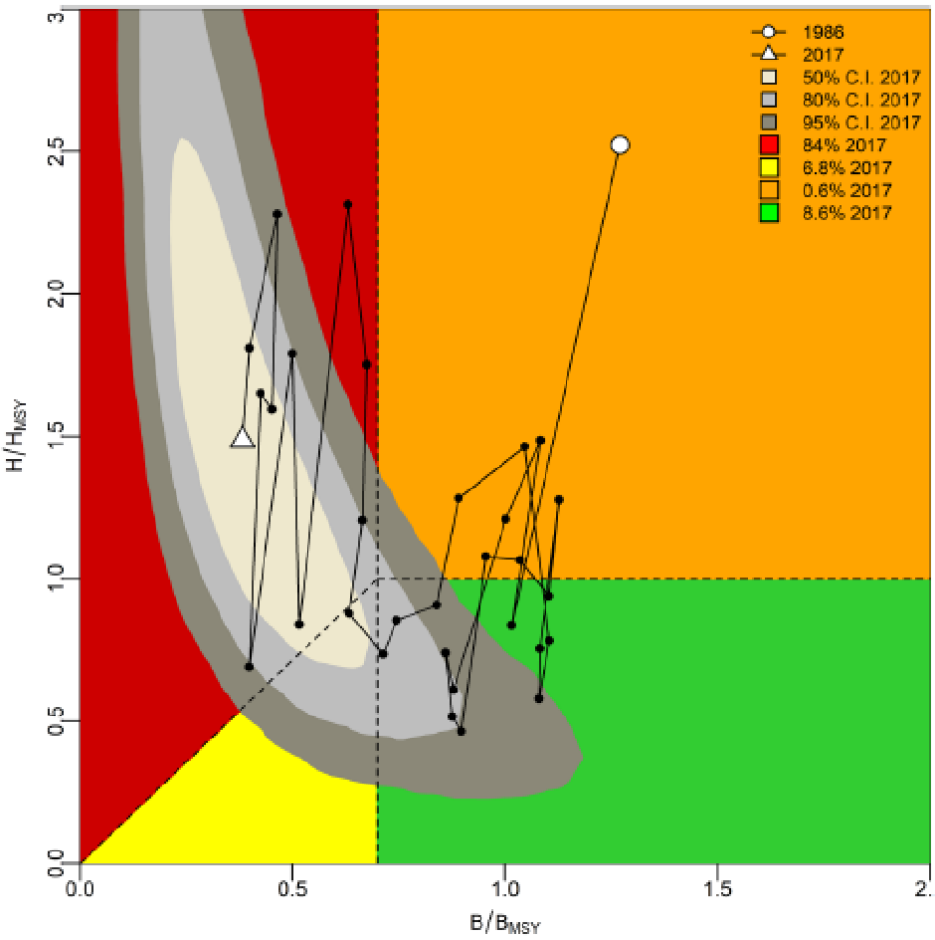

Figure 2. Kobe plot of relative biomass and relative exploitation rate from the best fitting production model for American Samoa bottomfish from 1982 to 2017
(Source: Langseth et al., 2019)

Table 4. Stock assessment parameters for the American Samoa BMUS complex.

Parameter	Value	Notes	Status
MSY	28.8 (16.4-55.9)	Expressed in 1000 lb (with 95% confidence interval)	
H_{2017}	0.15	Expressed in percentage	
H_{CR}	0.107 (0.044-0.228)	Expressed in percentage (with 95% confidence interval)	
H_{2017}/H_{CR}	2.75		Overfishing occurring
B_{2017}	102.6	Expressed in 1000 lb	
B_{MSY}	272.8 (120.8-687.4)	Expressed in 1000 lb (with 95% confidence interval)	
B_{2017}/B_{MSY}	0.38		Overfished

(Source: Langseth et al., 2019)

Table 5. Annual estimated BMUS catch (lb) in American Samoa from 2000-2019

Year	Estimated Total Catch (lb)	Estimated Commercial Catch (lb)
2000	13,850	3,693
2001	30,064	3,447
2002	23,621	1,448
2003	12,971	2,511
2004	11,000	3,233
2005	8,226	2,490
2006	3,051	2,203
2007	10,913	4,001
2008	22,095	3,171
2009	34,388	3,035
2010	7,044	1,084
2011	14,083	711
2012	2,099	1,161
2013	5,732	882
2014	13,984	3,140
2015	21,528	2,047
2016	19,307	1,131
2017	14,791	1,131
2018	11,957	838
2019	11,093	1,402
Three-Year Average (2017-2019)	**12,614**	**1,124**

(Source: WPRFMC, 2020a)

2.2 Features Common to All Alternatives

Each of the alternatives considered assumes that all existing Federal and local resource management regulations will continue alongside non-regulatory monitoring of catch through the creel survey expansions from the NMFS Western Pacific Fishery Information Network (WPacFIN) and the DMWR commercial receipt system. While the Council has two years to prepare and implement an FMP, FMP amendment, or proposed regulations to rebuild an overfished stock, if overfishing is still occurring for that stock, the Council should immediately take appropriate steps to end overfishing (see MSA Section 304(e)(6) and 50 C.F.R. § 600.310(j)(2)(i)). NMFS is working to implement an interim measure for the fishery while the Council develops an appropriate ACL and AM for 2021 and beyond. If approved by the Secretary, the Council's rebuilding plan measures would replace and supersede the interim measure.

There is no Federal permit or reporting required to fish for BMUS in American Samoa, however, a commercial fishing license is required for all fishermen engaged in commercial fishing in American Samoa waters by the territorial government of American Samoa (ASCA § 24.0981).

Additionally, the territory requires all entities that sell seafood products to report sales monthly to the American Samoa DMWR (ASAC § 24.0906), who reports commercial fishery sales information to NMFS through WPacFIN. Under each of the alternatives, NMFS would work with WPacFIN and DMWR to encourage timely processing of data and would track catches toward any applicable limit as data are provided.

The ability to coordinate a closure of both Federal and territorial waters would improve management measures associated with a designated catch limit, but American Samoa 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 analyses for each proposed alternative account only for action that NMFS can take within its regulatory authority. Each action alternative assumes that only Federal waters could be closed as the result of the in-season AM when NMFS projects that the catch has exceeded the implemented ACL. The analyses are also based on an effective date of January 1, 2021, to provide a baseline for comparison if the measures were enacted at the beginning of the next fishing year.

2.3 Alternative 1: No Action (Status Quo Alternative)

Under Alternative 1, the Council would not implement a rebuilding plan with an ACL, AM, or other associated management measure to prevent overfishing of BMUS in American Samoa and rebuild the bottomfish fishery. Alternative 1 serves as the no-management alternative. Since the fishery did not operate under an ACL in 2018 or 2019, this would also act as the "status quo" and environmental baseline alternative. In the absence of an ACL, the fishery would not operate under catch limits and AMs would not be required. The fishery would continue to be subject to other Federal and territorial management measures such as requirements for a commercial fishing license, restrictions from using destructive fishing methods, and commercial reporting requirements. The Council and NMFS would continue to monitor catches through the creel survey expansions from WPacFIN, the DMWR commercial receipt system, and other sources of data as available.

The Council and NMFS are required to implement ACLs and AMs for fisheries managed under a FMP, so this alternative would not be in compliance with the MSA, implementing Federal regulations, or the provisions of the Council's FEP. While Alternative 1 does not meet the stated purpose and need for action, it serves as the "status quo" and environmental baseline alternative against which effects on the human environment of action alternatives can be compared.

2.3.1 Expected Fishery Outcome (Alt. 1)

Under Alternative 1, the American Samoa bottomfish fishery is expected to continue fishing as it has in the past and harvest annual catch of American Samoa BMUS similar to recent years. Although ACLs implemented in previous years were based on the American Samoa bottomfish complex prior to Amendment 5 to the FEP that reduced the number of MUS from 17 to 11, catches have not approached the ACL for American Samoa bottomfish since they were implemented in 2012 (Table 6). Due to the lack of in-season closures, ACLs and associated AMs did not functionally constrain the fishery. Additionally, catches in 2018 and 2019 (when no ACL or AMs were implemented) were similar to catches during previous years when ACLs were implemented (Table 6), indicating that fishery performance does not change dramatically

whether or not ACLs and AMs are implemented. Under these conditions, past fishery performance can be used to approximate behavior in the fishery in the absence of a catch limit with a closure (i.e., performance in an unconstrained fishery), and it is therefore expected that catches in subsequent years would continue to be similar to past years. All other applicable fishing regulations would remain in place and the bottomfish fishery would continue to be monitored by NMFS and the Council.

Table 6. Comparison of American Samoa bottomfish catches to the ACLs from 2012 to 2019. ACLs were not implemented in 2018 and 2019.

Year	ACL (lb)	Catch (lb)	Percent of ACL
2012	99,000	2,099	2.12
2013	101,000	5,732	5.68
2014	101,000	13,984	13.85
2015	101,000	21,528	21.31
2016	106,000	19,307	18.2
2017	106,000	14,791	13.95
2018	NA	11,957	NA
2019	NA	11,093	NA

(Source: WPRFMC, 2020a)

2.3.2 Estimated Conservation and Management Benefit (Alt. 1)

Under Alternative 1, there would be no anticipated reduction of BMUS catch in American Samoa in future years, and annual catch would continue to be similar to the recent three-year (2017 to 2019) average catch of 12,614 lb. This level of annual catch would not serve to reduce overfishing or rebuild the fishery.

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 to fishing communities in American Samoa compared to other alternatives. Alternative 1 would not constrain bottomfish fishing activity in American Samoa, so it is not expected to adversely affect the fishing communities. However, Alternative 1 would not reduce overfishing of BMUS relative to recent levels nor help rebuild the stock complex. This would likely cause the stock complex condition to continue to worsen and elongate the timeframe to improve the stock status relative to the action alternatives, which may have longer-term cultural, economic, and social impacts.

Since the fishery, and therefore, commercial sales are expected to remain consistent, the Council anticipates that an average of 1,124 lb of bottomfish would be sold in 2021 (see Table 9). At the recent average price of $4.44 per lb, expected revenue would be $4,985. Using the estimated number of 30 fishery participants from the 2020 LOF (85 FR 21095, April 16, 2020), each fisher would earn approximately $167 (Table 9). This alternative would not constrain bottomfish fishing activity in American Samoa, so it is not expected to adversely affect the fishing communities in American Samoa. Similarly, non-commercial fishing (inclusive of recreational, sustenance, and cultural fishing) would be unaffected.

2.4 Alternative 2: Implement an Annual Catch Limit of 1,500 lb and an Accountability Measures over the next 10 years (preferred alternative)

Under this alternative, the Council would utilize BSIA to implement an ACL of 1,500 lb for the American Samoa bottomfish fishery for the next 10 years (2021 to 2030) to end overfishing as quickly as possible and allow for the rebuilding of the stock. This is the highest level of catch that would be effective in ending overfishing and rebuilding the fishery within 10 years. An in-season AM would be implemented for the fishery in which NMFS would monitor catch throughout the year and close Federal waters to bottomfish fishing if and when the ACL is reached. Catches from both Federal and territorial waters would be counted towards the ACL. Due to the relatively low nature of the ACL and level of recent average annual catch in the fishery, Federal waters around American Samoa would likely be closed to bottomfish fishing within the first few months of the year.

The Council requested PIFSC to produce biomass projections for the American Samoa bottomfish fishery from 2020 to 2031 to help determine T_{min} for the rebuilding plan with annual catches ranging from zero to 3,000 lb (Figure 3), as the specification of a rebuilding time is required per MSA 304(e)(4) for any overfished fishery. B_{MSY} for the American Samoa bottomfish multi-species stock complex is 272,800 lb (Table 4; Figure 3). Utilizing these projections, T_{min} would equal 10 years in the absence of fishing, and thus, T_{max} also equals 10 years. While the shortest possible time to rebuild the stock to B_{MSY} would be to have zero fishing mortality (i.e., annual catch of zero), this would not take into account the needs of the American Samoa fishing community as required in the MSA Section 304(e)(4)(A)(i). Additionally, the projections show that the American Samoa bottomfish fishery can be rebuilt to its B_{MSY} by T_{min} (i.e., in 10 years) with an annual catch of 1,500 lb (Table 7). An ACL of 1,500 lb would both prevent overfishing and ensure that the fishery will rebuild in the shortest possible time, so the T_{target} for this rebuilding plan is also 10 years. The mean $F_{rebuild}$ for T_{target} with an annual catch of 1,500 lb would be 0.0094, ranging from 0.0055 to 0.0153 over the course of those 10 years. According to the projections for stock biomass over the next ten years, an annual catch level of 1,500 lb would generate biomass increases for the stock from approximately 10 to 14 percent annually, with a total biomass increase of 178 percent over 10 years. The parameters required by MSA 304(e) and implementing regulations at 50 CFR 600.310(j)(3) for a rebuilding plan for an overfished fishery are presented in Table 7.

There is little available information on the life history for American Samoa BMUS, and similarly, little is known on how the species of the stock complex interact with the surrounding marine ecosystem. Thus, the basis of the decision for an ACL of 1,500 lb coincides with MSA requirements to end overfishing and rebuild the stock as quickly as possible while not exceeding 10 years. Additionally, the Council's P* working group, who met virtually on April 16, 2020, recommended a reduction score of 20 percent at a 30 percent risk of overfishing (WPRFMC, 2020b). The annual catch level of 1,500 lb is equivalent to a P* of 24 to 25 percent risk of overfishing, which is below the P* recommended level of 30 percent risk of overfishing (equivalent to an annual catch of 2,000 lb).

In American Samoa archipelagic fisheries, the fishing year begins January 1 and ends on December 31. In accordance with 50 CFR 665.4, when NMFS projects that catches will reach an ACL for any stock or stock complex, the agency must restrict fishing for that stock or stock

complex in the applicable U.S. EEZ to prevent catches from exceeding the ACL. The restriction may include, but is not limited to, closing the fishery, closing specific areas, or restricting effort (76 FR 37286, June 27, 2011). However, an in-season restriction is difficult to implement for any territorial bottomfish fishery because catch statistics only become available about six months after local management agencies collect the data. Regardless, the Council proposes an accountability measure which would require NMFS to monitor catch for the stock complex relative to its ACL as quickly as possible given the limitations in the data collection and processing methods. If landings of the stock complex exceed the specified ACL during the fishing year, the AM will require NMFS to close the fishery in Federal waters. As an additional performance measure specified in the FEP, if catches exceed any ACL more than once in a four-year period, the Council must re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness. Future changes to an ACL would be subject to separate environmental review at such time as changes are proposed and are not part of the current proposed action.

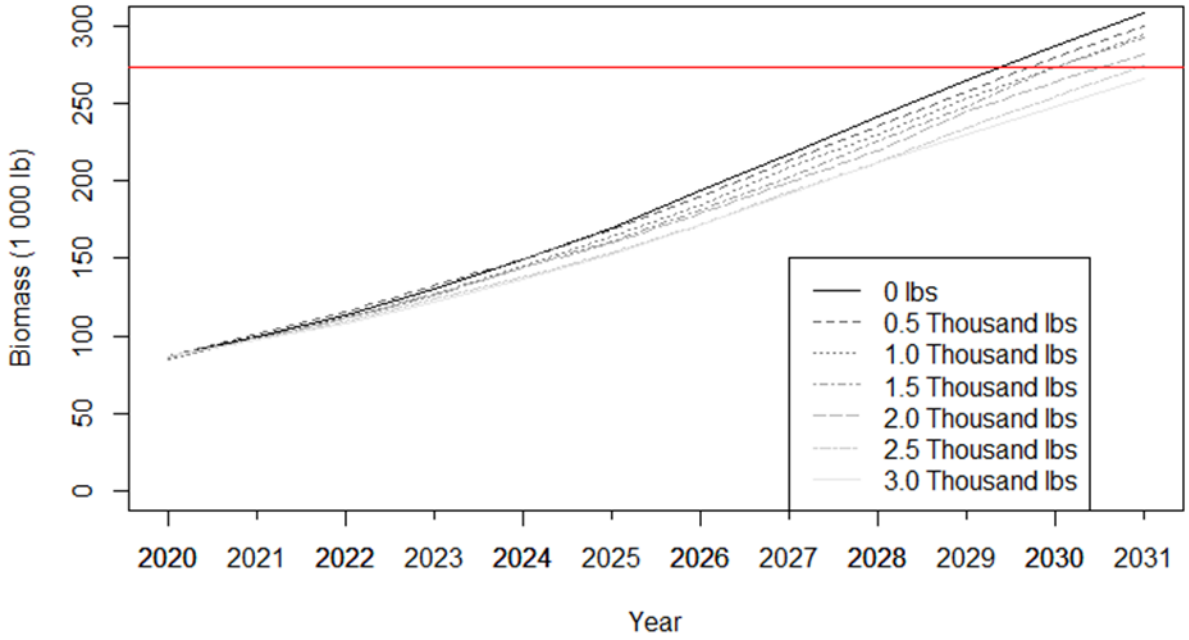

Figure 3. Projected biomass of the American Samoa bottomfish stock complex from 2020 to 2031 with annual catches from 0 to 3,000 lb. The red line denotes B_{MSY} at 272,800 lb. (Source: PIFSC Stock Assessment Program)

Table 7. Rebuilding plan parameters under Alternative 2 as required by National Standard 1 for an overfished fishery.

Parameter	Value
T_{min}	10 years
T_{target}	10 years
T_{max}	10 years
Mean $F_{rebuild}$	0.01

Table 8. Projected biomass (1,000 lb) of the American Samoa bottomfish stock complex from 2020 to 2031 with annual catches (lb) ranging from 0 to 15,000.

Annual Catch	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
0	87.0	99.4	113.9	130.6	149.3	169.8	193.4	216.5	240.9	264.3	286.9	308.2
500	86.5	100.3	115.1	132.2	149.5	168.7	189.9	212.9	235.1	256.7	279.1	300.1
1,000	85.2	98.1	111.9	127.5	145.6	164.2	184.0	208.7	229.2	252.7	272.8	294.5
1,500	85.6	98.3	111.2	126.3	143.8	160.7	181.2	202.6	225.1	247.6	273.5	292.5
2,000	87.3	97.9	111.4	126.7	143.7	160.4	178.5	198.6	219.7	244.8	263.2	281.9
2,500	87.0	97.2	109.1	123.9	137.6	154.0	172.0	193.1	212.2	233.6	253.9	274.2
3,000	86.4	97.1	108.0	121.6	136.5	152.6	171.4	191.7	212.1	229.4	247.4	265.2
3,500	85.7	95.9	107.8	121.2	135.2	149.5	166.2	185.3	201.4	219.8	238.3	259.2
4,000	85.6	94.0	104.2	115.9	129.1	144.0	159.8	174.6	192.7	211.3	231.7	250.1
4,500	86.1	95.6	107.4	117.5	128.8	143.2	157.8	174.8	192.3	209.3	227.8	244.9
5,000	85.0	93.0	102.7	113.4	127.1	137.6	152.2	167.3	182.1	200.0	217.7	234.7
5,500	86.5	94.0	103.3	113.4	124.2	135.3	148.4	163.2	182.0	197.9	216.4	232.1
6,000	86.8	94.7	102.7	112.8	124.3	133.8	144.2	158.6	173.8	188.3	204.4	218.3
6,500	85.3	92.2	100.0	108.5	117.5	130.0	139.2	151.5	165.2	179.0	195.2	212.6
7,000	84.6	91.9	98.8	106.1	114.5	125.5	133.7	143.7	157.3	170.2	185.0	198.7
7,500	85.7	91.7	97.9	104.6	112.3	120.9	130.7	141.2	152.1	163.8	176.6	189.4
8,000	85.8	91.9	97.1	103.1	111.9	120.9	128.5	137.7	146.7	156.5	167.9	180.6
8,500	85.8	91.3	96.9	103.0	108.6	115.8	123.3	131.8	141.9	150.3	162.2	172.9
9,000	86.3	90.4	95.5	100.5	106.7	112.9	119.6	129.4	138.0	147.5	154.6	166.5
9,500	85.7	89.6	94.2	98.6	103.3	109.2	115.5	122.2	130.3	136.9	144.5	152.2
10,000	85.3	87.7	91.7	95.8	100.7	105.2	110.1	114.8	120.8	128.0	134.1	142.7
10,500	86.0	88.8	91.9	95.9	98.5	101.2	106.3	111.2	114.5	118.4	125.4	131.8
11,000	86.0	87.8	90.8	93.6	96.7	98.4	103.1	106.4	110.4	112.1	118.7	123.6
11,500	84.9	86.1	88.6	89.6	92.8	93.2	96.9	98.8	101.5	103.2	106.6	108.3
12,000	85.5	86.4	87.3	87.7	89.3	89.6	90.4	91.4	93.9	95.5	97.1	101.4
12,500	84.9	85.6	86.5	88.5	89.3	90.6	91.4	92.4	94.6	94.0	95.9	95.2
13,000	85.9	85.4	85.4	85.4	86.8	86.5	86.9	86.0	85.3	85.7	85.7	85.8
13,500	86.2	85.5	85.6	84.1	84.2	82.7	80.9	79.6	78.3	76.6	73.1	70.5
14,000	84.8	84.4	82.0	81.5	78.6	77.4	74.4	71.7	69.8	65.4	61.5	57.8
14,500	86.3	84.9	83.2	80.5	79.6	77.4	73.2	70.2	66.5	62.2	57.7	53.5
15,000	84.5	82.6	80.0	77.2	75.0	71.8	68.2	64.3	58.5	53.7	47.3	41.6

(Source: PIFSC Stock Assessment Program)

2.4.1 Expected Fishery Outcome (Alt. 2)

Under Alternative 2, the American Samoa bottomfish fishery is expected to continue fishing as it has in the past and harvest annual catch of American Samoa BMUS similar to recent years because fishery performance has been relatively consistent regardless of the implementation of an ACL (see Table 6). However, due to the relatively low nature of the ACL, it is expected that catch under Alternative 2 would be slightly less than Alternative 1. There were no in-season management measures (e.g., fishing closures) that limited fishing activity in previous years, so management under catch limits did not functionally constrain the fishery. It is likely that the proposed ACL will be exceeded because the estimated annual catch for the fishery has exceeded the proposed ACL in all years from 2000 to 2019 (see Table 5), and the in-season AM will result in a Federal fishery closure early in the year. There are no regulations in place in the territorial waters to limit catch alongside this Federal proposed action, so it is likely that fishing would continue in territorial waters and may offset the potential benefits of the closure of Federal waters. The American Samoa DMWR may promulgate rules to complement the potential Federal closure; however, without the cooperation of the local government and communities, both the ACL specification and AM of the rebuilding plan may be ineffective in ending overfishing and rebuilding the stock to B_{MSY}. NMFS does not anticipate that the American Samoa government will implement a complementary closure of territorial waters. Despite this, Alternative 2 provides the Federal action that will be most likely to support rebuilding and ending overfishing within the fishery by reducing bottomfish fishing in Federal waters and reducing overfishing in the fishery relative to the no action alternative while still allowing some catch. All other applicable fishing regulations would remain in place and the bottomfish fishery would continue to be monitored by NMFS and the Council.

Given average annual catch in recent years (Table 5), assuming that catch is harvested in a relatively proportional manner throughout the year, it is likely that the American Samoa bottomfish fishery will exceed its ACL within the first few months of the year. Considering monthly catch expansions for the fishery from 2016 to 2018 generated by WPacFIN (Figure 4), an ACL of 1,500 lb is expected to be exceeded by March after 2,224 lb of catch through the month of February; however, this level of catch may be reached as early as January (based on 2017 fishery performance) or as late as March (based on 2018 fishery performance). The resulting closure of Federal waters will deny fishing access to some of the offshore banks where bottomfish fishing occurs, which may have implications for several fishing villages in American Samoa. However, a closure of Federal waters will likely have little impact on reducing overall fishing mortality due to the relatively small amount of bottomfish EFH around American Samoa that is situated in Federal waters.

The Council and NMFS do not possess the spatial information or data to discern the amount of BMUS harvested in Federal versus territorial waters around American Samoa. However, if it is assumed that catch is proportional to the amount of bottomfish EFH in either Federal or territorial waters, a rough estimate can be made for the reduction in catch under an ACL of 1,500 lb. If the fishery continues operating as it has in recent years with an average annual catch of 12,614 lb, there would be another 10,390 lb of catch expected to be harvested in the fishery the remainder of the year. If catches are proportional to bottomfish habitat in Federal and territorial waters (15 and 85 percent, respectively; see Figure 1), 1,559 lb that might have ordinarily been

caught in Federal waters would not be caught in the fishery. Therefore, the total catch for this scenario would be 11,055 lb rather than the recent average catch of 12,614 lb that would be expected under the no action alternative, but this improvement may not be fully realized if fishing is displaced to territorial waters. Thus, this Alternative will slightly reduce fishing, but adverse impacts to the American Samoa bottomfish stock will persist, the stock will continue to be subject to overfishing, and rebuilding will be delayed.

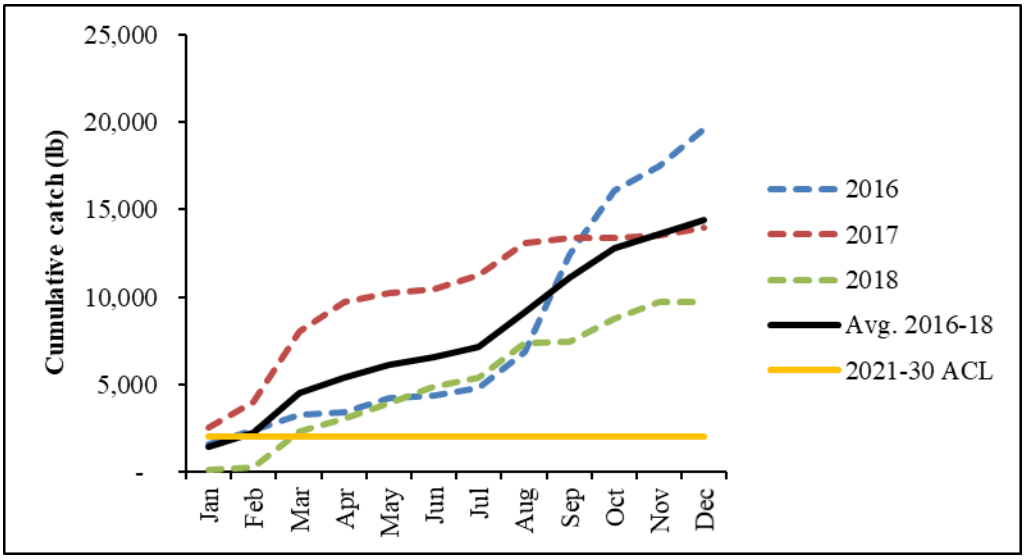

Figure 4. Cumulative monthly catch of American Samoa BMUS from 2016 to 2018 compared to the proposed ACL for Alternative 2 in 2021-2030.
(Source: WPacFIN)

Though fishing cannot necessarily be constrained in territorial waters, Alternative 2 would serve to slightly reduce catch in Federal waters and be in compliance with the MSA, implementing Federal regulations, and the provisions of the Council's FEP that require ACLs and AMs to be implemented annually. Alternative 2 also meets the stated purpose and need for Federal action to be implemented to try to end overfishing and rebuild the American Samoa bottomfish fishery.

2.4.2 Estimated Conservation and Management Benefit to MUS (Alt. 2)

Alternative 2 is intended to reduce overfishing and rebuild the American Samoa bottomfish fishery as quickly as possible while still allowing some harvest to occur. Under Alternative 2, there would likely be minor conservation and management benefits to American Samoa BMUS by reducing harvest in Federal waters by approximately 1,577 lb in a given year. However, any displacement of fishing effort from Federal waters to territorial waters could offset the anticipated reduction in catch. Even if Federal waters are closed to the fishery in accordance with the AM, the fishery will continue to operate in territorial waters in the absence of the territory implementing a complementary fishery closure. It is expected that ACL of 1,500 lb will quickly be exceeded due to data on recent average annual catch for the fishery. Thus, adverse impacts to the American Samoa bottomfish stock from fishing will remain, the stock will continue to be subject to overfishing, and the rebuilding of the fishery will be delayed, but the alternative will still supply some conservation benefit to the American Samoa bottomfish stock complex relative to the no action alternative.

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

Alternative 2 is intended to reduce overfishing while mitigating cultural, economic, and social impacts to American Samoa communities by still allowing some level of fishing relative to the other action alternative. Under Alternative 2, minor cultural, economic, and social effects are likely to impact fishermen who harvest bottomfish in Federal waters, as it is expected that the ACL will be exceeded in the first two months of the year and Federal waters will be closed as a result. If catch is reduced by an estimated 1,577 lb, and roughly nine percent of that catch would be sold (see Table 9), there would be an expected loss of revenue of $575 for the fishery, or $20 per fisher. However, it is also expected that fishing will continue to occur in territorial waters if the ACL is exceeded and fishing in Federal waters is prohibited. Large impacts may occur depending on if the territory implements complementary closures with the Federal action.

An important aspect of American Samoa is perpetuating *Fa'a Samoa* (i.e., "The Samoan Way", custom and practice), which governs local social norms and practices. The foundation of *Fa'a Samoa* is the title system at the village and higher levels, which is sustained and signified by the production and presentation of food and other goods, including deep and shallow water bottomfish at a variety of important cultural ceremonies. A letter from American Samoa DMWR to NMFS on June 15, 2020 noted that deepwater snappers are important for cultural ceremonies and *fa'alavelave* (e.g., funerals, weddings, births, special birthdays). This importance for subsistence and cultural use is evident during important community events, and demand for bottomfish varies depending on the need for fish at government and cultural events (WPRFMC, 2020a). Reducing access to bottomfish resources may harm the cultural practice of *Fa'a Samoa* and its role in maintaining community stability, but Alternative 2 would result in a minor reduction in the availability of locally caught bottomfish over the next 10 years.

If access to bottomfish is completely restricted, there may also be impacts to the socio-economic setting of American Samoa. While the recent average annual catch of BMUS in American Samoa is 12,614 lb, an estimated 1,124 lb (i.e., nine percent) of that was sold (Table 9; WPRFMC, 2020a). Considering that generally less than ten percent of bottomfish catch is sold, the fishery can be considered predominantly non-commercial, primarily providing fish for sustenance and cultural events. The estimated commercial value of the bottomfish fishery was $5,708 in 2019, with an average price per pound was $4.07 for BMUS species (Table 9: WPRFMC, 2020a). If total expected catch is 11,055 lb and nine percent of the catch is sold at $4.44 pound that means 995 lb would be sold for a revenue of $4,418. Using the number of fishery participants from the 2020 LOF, the 30 participants would earn an average of $147. This is a decrease of $20 per fisher, or 12 percent from the status quo alternative. If catch were to dramatically decrease from recent averages due to the fishing constraints or complementary closures of territorial waters associated with Alternative 2, fishery revenues could decrease by over 80 percent. However, it is expected that fishermen will compensate for a closure of Federal waters by catching BMUS in territorial waters that will likely remain open to fishing, and revenue would be closer to what is expected under the no action alternative. NMFS does not have information to estimate the magnitude of compensation that would occur. Thus, impacts associated with the sale of bottomfish would cause adverse effects to fishers if there were to be a complete moratorium on bottomfish fishing, but the effects to revenue would be relatively minor if fishing is constrained in Federal waters alone once the ACL is reached.

Table 9. Summary of American Samoa bottomfish commercial revenues from 2009 to 2019.

Year	Estimated total catch (lb)	Estimated pounds sold (lb)	Percent sold	Estimated revenue ($)	Average price per pound ($)
2009	34,388	3,035	9	8,208	2.70
2010	7,044	1,084	15	3,398	3.13
2011	14,083	711	5	1,949	2.74
2012	2,099	1,161	55	3,796	3.27
2013	5,732	882	15	3,257	3.69
2014	13,984	3,140	22	11,051	3.52
2015	21,528	2,047	10	6,074	2.97
2016	19,307	1,131	6	3,896	3.44
2017	14,791	1,131	8	5,688	5.00
2018	11,957	838	7	3,558	4.25
2019	11,093	1,402	13	5,708	4.07
Three-year avg.	12,614	1,124	9	4,985	4.44

(Source: WPRFMC, 2020a)

2.5 Alternative 3: Establish a Temporary Moratorium on Bottomfish Fishing in Federal Waters around American Samoa

Under Alternative 3, the Council would recommend a fishing prohibition for and possession of BMUS in Federal waters around American Samoa for the next 10 years (2021-2030). This action would be equivalent to implementing a catch limit of 0 lb in Federal waters around American Samoa and is the maximum action that the Council could recommend to address the overfishing of bottomfish. There would be no AM associated with this alternative because catch would not need to be monitored towards an ACL. It is expected that there would be displacement of bottomfish fishing in Federal waters around American Samoa to territorial waters since it is not anticipated that the American Samoa government will implement a complementary closure of territorial waters for the fishery. Despite fishing for BMUS being likely to continue in territorial waters, Alternative 3 would likely result in less annual catch for the American Samoa bottomfish fishery than Alternatives 1 and 2. All other applicable fishing regulations would remain in place and the bottomfish fishery would continue to be monitored by NMFS and the Council.

Using biomass projections for various levels of catch produced by PIFSC for the American Samoa bottomfish fishery from 2020 to 2031 (see Section 2.4), the T_{min} for rebuilding the fishery would remain at 10 years. This time period is the shortest amount of time to rebuild the American Samoa bottomfish stock to its B_{MSY}. Thus, T_{target} and T_{max} for this alternative, if adopted as the rebuilding plan, would also be 10 years in accordance with MSA Section 304(e)(4) and implementing regulations at 50 CFR 600.310(j)(3). Because Alternative 3 is intended to result in an annual catch of 0 lb, the $F_{rebuild}$ for the fishery would be 0 in the absence of fishing. According to the projections for stock biomass over the next ten years, an annual catch level of 0 lb would generate biomass increases for the stock from approximately 8.5 to 14.5 percent annually, with a total biomass increase of approximately 189 percent over the course of

10 years. The parameters under this alternative required for a rebuilding plan for an overfished fishery are presented in Table 10.

Table 10. Rebuilding plan parameters under Alternative 3 as required by National Standard 1 for an overfished fishery.

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

Similar to Alternative 2, there is little available information on the life history for American Samoa BMUS to inform Alternative 3, and not much is known on how the species of the stock complex interact with the surrounding marine ecosystem. An ACL of 0 lb would coincide with MSA requirements to end overfishing and rebuild the stock as quickly as possible, but would not take the American Samoa fishing community into consideration nor allow the fishery as much catch as it could be harvesting while rebuilding in the same time period.

2.5.1 Expected Fishery Outcome (Alt. 3)

Under Alternative 3, the Council expects that the catch of American Samoa bottomfish would be slightly less than Alternatives 1 and 2, but also that the fishery will continue fishing at relatively similar levels to recent years. Though the closure of Federal waters to the bottomfish fishery would effectively be the same as setting an ACL of 0 lb, it is expected that there will be displacement of fishing effort from Federal to territorial waters. The Council does not anticipate that the American Samoa government will implement a complementary closure of territorial waters associated with this action, so it is expected that the American Samoa bottomfish fishery will continue operating in territorial waters. As described for Alternative 2, the Council and NMFS do not possess the spatial information or data to discern the amount of BMUS harvested in Federal versus territorial waters around American Samoa. However, if it is assumed that catch is proportional to the amount of bottomfish EFH in either Federal or territorial waters and 15 percent of bottomfish EFH around American Samoa occurs in Federal waters, a rough estimate can be made for the reduction in catch resulting from Alternative 3. Assuming the fishery continues to harvest bottomfish as it has in recent years, the recent average annual catch of 12,614 lb (Table 5) would be reduced by approximately 15 percent (1,892 lb) to 10,722 lb with a closure of Federal waters; however, this also assumes that there would be no displacement of fishing effort to territorial waters, which is unlikely. Thus, this alternative will result in a moderate reduction in fishing, but it is expected the American Samoa bottomfish stock will continue to be subject to overfishing and the time necessary for it to rebuild will be prolonged.

Though fishing cannot necessarily be constrained in territorial waters, Alternative 3 would serve to reduce catch in Federal waters slightly more than Alternative 2 while being in compliance with the MSA, implementing Federal regulations, and the provisions of the Council's FEP that requires ACLs and AMs to be implemented annually. However, this alternative does not necessarily consider the needs of the American Samoa fishing community, which is highly dependent on locally harvested bottomfish. Implementing Alternative 3 is estimated to cause the

stock to rebuild in a similar time frame to Alternative 2, but Alternative 2 allows more bottomfish catch in Federal waters and would have increased consideration for the needs of the local fishing community.

2.5.2 Estimated Conservation and Management Benefit to MUS (Alt. 3)

Alternative 3 would reduce overfishing and rebuild the American Samoa bottomfish fishery as quickly as possible (i.e., in the same time frame as Alternative 2) by prohibiting all bottomfish catch in Federal waters. Under Alternative 3, there would likely be minor conservation and management benefits to American Samoa BMUS relative to the no action alternative by eliminating harvest in Federal waters, which would reduce total harvest compared to the no action alternative by approximately 1,892 lb in a given year. However, any displacement of fishing effort from Federal waters to territorial waters could offset the anticipated reduction in catch. If Federal waters are closed to the fishery under Alternative 3, it is expected that the fishery will continue to operate in territorial waters in the absence of the territory implementing a complementary fishery closure. Adverse impacts to the American Samoa bottomfish stock from fishing will likely remain, the stock will continue to be subject to overfishing and the rebuilding of the fishery will be delayed, but the alternative will supply some conservation benefit to the American Samoa bottomfish stock complex relative to the no action alternative.

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

Under Alternative 3, the Council expects that the American Samoa bottomfish fishery would perform similarly to Alternative 2 in future years. This alternative would close the fishery in Federal waters, and BMUS catch may be slightly reduced from the recent average. Catch is expected to be 10,722 lb (see Section 2.5.1) due to the reduction of catch from Federal waters. If nine percent of the expected catch is sold commercially at $4.44 per pound (see Table 9), the expected revenue would be $4,284. The estimated number of 30 fishery participants from the 2020 LOF would then earn $143 each if divided equally; this is a decrease of approximately $24, or 14 percent, per fisher from the status quo alternative. If fishermen compensated for a closure of Federal waters by catching BMUS in territorial waters that remained open to fishing, revenue would be closer to that expected under the no action alternative. NMFS does not have information to estimate the magnitude of compensation that may occur. Because this alternative is expected to result in less catch of bottomfish than Alternatives 1 and 2 despite fishing for BMUS being likely to continue in territorial waters, Alternative 3 will result in less catch available for subsistence, cultural, and religious purposes than the other alternatives.

Alternative 3 does not provide for authorized catch in Federal waters, but territorial waters would remain open to fishing for bottomfish. This would allow for some availability of bottomfish resources to the American Samoa fishing community, however, bottomfish are expected to be available in moderately lower quantities than under the no action alternative. Thus, Alternative 3 would pose greater constraints to fishermen than Alternatives 1 and 2, with minimal conservation gain. Given that the projected time frame to rebuild the fishery under an ACL of 0 lb would be the same as 1,500 lb (Alt. 2), the alternative does not provide a substantial additional conservation benefit. The Federal fishery closure under Alternative 3 may decrease the amount of bottomfish available to the community for subsistence, cultural, and religious purposes as well

as the amount of revenue available to fishermen. Revenue would be decreased relative to Alternatives 1 and 2, but this decrease is minimal and is not expected to result in any large or substantial social or economic effects to the American Samoa fishing community. Overall, this alternative does less than the no action and preferred alternatives to mitigate adverse cultural, economic, and social effects by hindering the amount of fish available to markets and for sustenance and cultural practices in American Samoa. Thus, Alternative 3 does not meet the need to mitigate socio-economic effects as well as the no action or preferred alternatives.

2.6 Alternative 4 – Implement an ACL of 1,500 lb, Federal Permitting and Reporting Requirements, and Bag Limits

Under Alternative 4, an ACL of 1,500 lb would be implemented for the American Samoa bottomfish fishery, as this is the level of annual catch that would allow the fishery to rebuild in 10 years (see Alternative 2). An in-season AM would be implemented similar to Alternative 2 where Federal waters would be closed to bottomfish fishing if this ACL is exceeded. Because approximately 15 percent of bottomfish EFH around American Samoa is situated in Federal waters, there would be 225 lb of bottomfish available to allocate among the fishers for an annual bag limit in Federal waters. The LOF 2020 estimates that there are 30 active fishers in the American Samoa bottomfish fishery, meaning that, when distributed equally, the annual bag limit for American Samoa bottomfish harvested from Federal waters would be 7.5 lb per fisher. When an individual fisher harvests bottomfish in Federal waters that would reach or exceed the amount of their bag limit in a given year, they will no longer be allowed to fish in Federal waters for the remainder of the year. The catch contributing to the bag limit of each fisher would also be counted against the ACL.

To effectively monitor the individual annual bag limits for bottomfish, permitting and reporting would be implemented for fishers harvesting bottomfish in Federal waters. Fishers who would like to harvest bottomfish in Federal waters will need to apply for and receive a Federal permit from NMFS. This permit will require the fishers to report the species and amount of all bottomfish catch harvested in Federal waters, which will then be counted against the implemented ACL. If the amount of catch reported by a fisher exceeds their individual annual bag limit, then they will no longer be permitted to fish in Federal waters for the rest of that fishing year.

2.6.1 Expected Fishery Outcome (Alt. 4)

Given the proportion of bottomfish EFH in federal waters (i.e., 15 percent, see Figure 1) and the average annual catch in recent years of 12,614 lb (Table 5), Alternative 4 would limit bottomfish catch to 225 lb in Federal waters around American Samoa. Considering the estimated amount of bottomfish catch estimated to harvested be from Federal waters in recent years (i.e. 1,892 lb, see Alternative 3), the implementation of a bag limit would result in total annual catch of 10,947 lb of bottomfish catch around American Samoa. However, this also assumes that there would be no displacement of fishing effort to territorial waters, which is unlikely. Thus, this alternative will result in a moderate reduction in fishing, but the American Samoa bottomfish stock will continue to be subject to overfishing and the time necessary for it to rebuild will be lengthened.

It is also likely that the American Samoa bottomfish fishery will exceed its ACL within the first few months of the year, similar to Alternative 2. Monthly catch expansions by WPacFIN for the fishery from 2016 to 2018 suggest that the fishery may exceed the 1,500 lb ACL by March with 2,224 lb of catch through February (Figure 4; see Section 2.4.1). If the expected annual catch under this alternative is 10,947 lb, there would be 8,723 lb expected to be harvested after Federal waters are closed to bottomfish fishing in March. If the 225 lb of catch originally available in Federal waters under the implemented bag limit is assumed to be harvested consistently over the course of the year (19 lb/month), 187 lb would normally be expected to be harvested in Federal waters in accordance with the bag limits after the time the fishery is anticipated to close. Thus, the total catch under this alternative would be reduced by 187 lb to an expected total of 10,760 lb under Alternative 4 rather than the recent average catch of 12,614 lb expected under the no action alternative. Again, this improvement may not be fully realized if fishing is displaced to territorial waters. Thus, this Alternative will slightly reduce fishing, but adverse impacts to the American Samoa bottomfish stock will persist, the stock will continue to be subject to overfishing, and rebuilding will be delayed.

Though fishing cannot necessarily be constrained in territorial waters, Alternative 4 would serve to reduce catch in Federal waters slightly more than Alternative 2 and slightly less than Alternative 3 while being in compliance with the MSA, implementing Federal regulations, and the provisions of the Council's FEP that requires ACLs and AMs to be implemented annually. However, this alternative does not necessarily consider the needs of the American Samoa fishing community, which is highly dependent on locally harvested bottomfish and may not be amenable to increased Federal regulations in the form of permitting and reporting. Implementing Alternative 4 is estimated to cause the stock to rebuild in a similar time frame to Alternative 2 and 3, but Alternative 2 allows more bottomfish catch in Federal waters and would have increased consideration for the needs of the local fishing community.

2.6.2 Estimated Conservation and Management Benefit to MUS (Alt. 4)

Alternative 4 would reduce overfishing and rebuild the American Samoa bottomfish fishery as quickly as possible (i.e., in the same time frame as Alternatives 2 and 3) by implementing the same ACL and AM as Alternative 2 with the added provisions of Federal permitting and reporting along with bag limits for harvest in Federal waters. Under Alternative 4, slight conservation and management benefits to American Samoa BMUS are expected relative to the no action alternative due to the reduction of harvest in Federal waters, which would reduce total harvest by approximately 1,855 lb annually relative to the no action alternative. However, any anticipated reduction in catch could be offset by the displacement of fishing effort from Federal waters to territorial waters. If Federal waters are closed to the fishery under Alternative 4, the fishery is expected to continue operations in territorial waters without the implementation of a complementary fishery closure by the territory. The American Samoa bottomfish stock will continue to experience adverse impacts from fishing and be subject to overfishing. Though rebuilding of the fishery may be delayed, this alternative will provide greater benefits to conservation than the no action alternative.

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

Under this alternative, it is expected that the American Samoa bottomfish fishery performance would be relatively similar to Alternative 2. Alternative 4 would implement Federal permitting, reporting, and bag limits in addition to the ACL and AM specified in Alternative 2. Catch under Alternative 4 is expected to be 10,760 lb (see Section 2.5.1) due to the reduction of catch from Federal waters and bag limits. If nine percent of the expected catch is sold commercially at $4.44 per pound (see Table 9), the expected revenue would be $4,300. The estimated number of 30 fishery participants from the 2020 LOF would then earn $143 each if divided equally; this is a decrease of approximately $24, or 14 percent, per fisher from the status quo alternative. If BMUS were caught in territorial waters that remained open to fishing due to fishermen compensating for the Federal closure, revenue would be closer to that expected under the no action alternative. NMFS does not have information to estimate the magnitude of compensation that may occur. Because this alternative is expected to result in less catch of bottomfish than Alternatives 1 and 2 (but more than for Alternative 3) despite the fishery being likely to continue operating territorial waters, Alternative 4 will result in less catch available for subsistence, cultural, and religious purposes.

Alternative 4 heavily regulates bottomfish harvest in Federal waters, but territorial waters would remain open to fishing for bottomfish without these policies. This alternative would allow for some availability of bottomfish resources to the American Samoa fishing community, but bottomfish are expected to be less available than under the no action alternative. Alternative 4 would implement increased restrictions to fishermen than Alternatives 1 and 2 while potentially allowing more bottomfish than Alternative 3. However, the conservation gain would be minor. The time frame to rebuild the fishery would be identical as each of the other alternatives, and Alternative 4 may decrease the amount of bottomfish available to the community for subsistence, cultural, and religious purposes. Revenue would be slightly decreased compared to Alternatives 1 and 2, but this decrease is not expected to result in any substantial social or economic effects to the American Samoa fishing community due to the minimal nature of the decrease. The increased regulations on fishermen to fish in Federal waters could deter some fishers from operating in Federal waters at all or may negatively impact the attitude of Federal management of the fishery. In summary, Alternative 4 does less than the no action and preferred alternatives to mitigate adverse cultural, economic, and social effects by hindering the amount of fish available to markets and for sustenance and cultural practices in American Samoa and increasing the regulatory burden on fishermen. Thus, Alternative 4 does not meet the need to mitigate socio-economic effects as well as the no action or preferred alternatives, and the implementation of more Federal regulations could result in additional unintended consequences.

2.7 Comparison of Features of the Alternatives

Table 11 presents a summary of various features of the alternatives to allow for comparison among the alternatives.

Table 11. Comparison of the proposed fishery management features and expected outcomes for this action.

Topic	Alt. 1 - No Action/Status Quo	Alt. 2 – ACL of 1,500 lb for 2021-2030	Alt. 3 – Closure of Fishery in Federal Waters	Alt. 4 – Federal Permitting, Reporting, and Bag Limits
General characteristics of alternative	No ACL or AM(s).	ACL set to reduce overfishing and rebuild the fishery; in-season fishery closure as the AM. Alt. 2 reduces adverse effects on fishing community relative to Alt. 3 and 4 but would have impacts to the fishing community relative to Alt. 1.	Moratorium on fishing for or possessing BMUS in Federal waters to reduce overfishing and rebuild the fishery. Alt. 3 has no reduction of adverse effects on fishing community during the period of effectiveness.	Requirement for fishers harvesting bottomfish in Federal waters to receive a permit and report their catch. Implementation of bag limits for permitted fishers. Alt. 4 reduces adverse effects on the fishing community relative to Alt. 3 but not Alt. 1 or 2.
Duration of management action	N/A.	10 years.	10 years.	10 years.
Authorized annual catch (lb) of BMUS in American Samoa	No limit.	1,500 lb.	0 lb.	1,500 lb. Individual bag limit of 7.5 lb in Federal waters.
Accountability Measure: Closure of Federal waters to bottomfish fishing when ACL is reached	No AM. The fishery would not be subject to a potential fishery closure.	If available data indicates the fishery will exceed the ACL, NMFS will close the fishery in Federal waters.	No AM implemented, as the fishery would be closed in Federal waters.	If reported data from the permitted fishers indicate that they have exceeded their bag limit, they will no longer be allowed to fish in Federal waters. For the overall ACl, same as Alt. 2.
Complementary closure of territorial waters by American	N/A.	Not anticipated. Not a part of the proposed action.	Same as Alt. 2.	Same as Alt. 2.

Samoa Government				
Possibility of fishery closure in Federal waters	None.	Possibly after Feb. each year from 2021-2030	Full year from 2021-2030.	Varies on an individual basis for bag limit. For the overall ACL, same as Alt. 2.
Expected annual catch of American Samoa BMUS (see text for detail)	12,614 lb.	11,055 lb.	10,722 lb.	10,760 lb.
Reduces overfishing relative to previous years	No, catch expected to be similar to recent annual averages.	Yes, slight reduction of catch relative to recent annual averages (less than Alt. 3 and 4).	Yes, slight reduction of catch relative to recent annual averages (more than Alt. 2, less than Alt. 3).	Yes, slight reduction of catch relative to recent annual averages (more than Alt. 2, less than Alt. 3).
Authorized catch would allow stock biomass to increase during the specification period	No.	Yes, reduction in catch would allow biomass to increase at the maximum rate; however, biomass increases may not be realized due to a shift of fishing effort from Federal to territorial waters.	Yes, strict reduction in catch would allow biomass to increase at the maximum rate; however, biomass increases may not be realized due to a shift of fishing effort from Federal to territorial waters.	Yes, reduction in catch would allow biomass to increase at the maximum rate; however, biomass increases may not be realized due to a shift of fishing effort from Federal to territorial waters.
Mitigates effects of immediately ending overfishing on communities during time frame of rebuilding plan	Yes. Fishing in the fishery would be the same as it has been in previous years. This alternative lacks long-term benefits of shortening rebuilding time frame the action alternatives would	Yes. More than Alt. 3 but less than Alt. 1 (status quo), as more fishing would be expected than under Alt. 3 but less than would be expected under Alt. 1 during rebuilding from 2021-2030. The implementation of	In the short term, no. Not relative to Alt. 1 or 2, since a closure of Federal waters would be the most extreme action that the Council could take in implementing a rebuilding plan for the fishery.	Yes. More than Alt. 3 but less than Alt. 1 and 2 due to expected level of annual catch compared to the relatively low bag limit and ACL. The implementation of the ACL and bag limits alongside Federal

	provide.	an ACL, despite being relatively low, would help to mitigate impacts on the American Samoa fishing communities that depend on fishing in Federal waters for locally harvested bottomfish. Long-term, there would likely be additional benefit to rebuilding the stock than under Alternative 1, which could improve the future outlook of the fishery.	Long-term, there would likely be additional benefit to rebuilding the stock than under Alt. 1 and 2, which could improve the future outlook of the fishery.	permitting and reporting may seem excessive to local communities in American Samoa, who may choose opt to fish in territorial waters instead of submitting to additional regulations. Long-term, same as Alt. 2.

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