

**DRAFT Amendment 6 – Fishery Ecosystem Plan for American Samoa**

***Bottomfish Management Unit Species Reclassification***

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## DRAFT Amendment 6 to the Fishery Ecosystem Plan for American Samoa

### *Bottomfish Management Unit Species Reclassification*

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### **Abstract**

The Western Pacific Fishery Management Council (Council) established the Fishery Ecosystem Plans for American Samoa (FEPs, as amended) to conserve and manage fisheries in the US Exclusive Economic Zone (EEZ, or federal waters) in the Pacific Islands. Currently, the FEPs include bottomfish management unit species (MUS) considered to be in a federal fishery and needing conservation and management. Under the National Standard (NS) guidelines (50 CFR 600.305 and 600.310) for the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), the Council and the National Marine Fisheries Service (NMFS) manage MUS that generally are targets of a federal fishery and caught predominantly in federal waters. Implementing regulations at 50 CFR 600.305(c)(7) strongly recommend the Council to periodically review the FEP and the BSIA to determine if stock listed therein are appropriately identified, and, as appropriate, stocks should be reclassified within the FEP, added to or removed from the FEP, or added to a new FMP or FEP, through an FEP amendment that documents the rationale for the decision. Additionally, section 306(b) of the Magnuson-Stevens Act describes that the FMCs have limited ability to manage stocks predominately caught in state (i.e., and territorial) waters; as a result, FMCs may identify these stocks as ECS in its FMPs or FEPs (81 FR 71858, October 18, 2016). Further, the NS1 Guidelines strongly recommended that the FMCs consider the extent to which a fishery may already be adequately managed by states (i.e., or territories) that, if in place, would weigh heavily against listing the species in its FEPs (50 CFR 600.305(c)(3)). The purpose of this action is to improve efficiency of bottomfish fishery management in American Samoa and the region.

## Acronyms and Abbreviations

ABD – Acceptable Biological Catch  
ACL – Annual Catch Limit  
AM – Accountability Measure  
CFR – Code of Federal Regulations  
CNMI – Commonwealth of the Northern Mariana Islands  
DOD – Department of Defense  
DPS – Distinct Population Segment  
EA – Environmental Assessment  
ECEWG – Ecosystem Component Expert Working Group  
ECS – Ecosystem Component Species  
EEZ – Exclusive Economic Zone  
EFH – Essential Fish Habitat  
ESA – Endangered Species Act  
FEP – Fishery Ecosystem Plan  
FMC – Fishery Management Council  
FMP – Fishery Management Plans  
FR – *Federal Register*  
IFKW – Insular False Killer Whale  
MFMT – Maximum Fishing Mortality Threshold  
MHI – Main Hawaiian Islands  
MMPA – Marine Mammal Protection Act  
MPA – Marine Protected Area  
MSST – Minimum Stock Size Threshold  
MSY – Maximum Sustainable Yield  
MUS – Management Unit Species  
NEPA – National Environmental Policy Act  
NMFS – National Marine Fisheries Service  
NOAA – National Oceanic and Atmospheric Administration  
NPDES – National Pollutant Discharge Elimination System  
NS – National Standard  
NS1 – National Standard 1  
OY – Optimum Yield  
PHCRT – Potentially Harvested Coral Reef Taxa  
PIFSC – Pacific Islands Fisheries Science Center  
PIRO – Pacific Islands Regional Office  
PRIA – Pacific Remote Island Area  
RFA – Regulatory Flexibility Act  
SAFE – Stock Assessment and Fishery Evaluation Report  
SDC – Status Determination Criteria  
SSC – Scientific and Statistical Committee  
US – United States  
WPFMC – Western Pacific Fishery Management Council (Council)

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# 1 INTRODUCTION

## 1.1 Background Information

The National Marine Fisheries Service (NMFS) and the Western Pacific Regional Fishery Management Council (WPFMC, or the Council) manage fishing in the Exclusive Economic Zone (EEZ) around the US Pacific Islands, including American Samoa. NMFS and the Council manage American Samoa bottomfish fisheries in the EEZ in accordance with the Fishery Ecosystem Plan for the American Samoa Archipelago (American Samoa FEP; WPFMC 2009), the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), and implementing regulations at 50 CFR 665. The American Samoa Department of Marine and Wildlife Resources (DMWR) manages fishing in territorial waters (i.e., generally 0 to 3 nm from shore) that are not part of the American Samoa FEP management area.

Section 302(h) of the Magnuson-Stevens Act requires the each regional fishery management council (FMC) to develop fishery management plans (FMP) for each fishery under its area of management authority (i.e., the EEZ, or federal waters) in need of conservation and management. As discussed below and pursuant to implementing regulations of the Magnuson-Stevens Act at 50 CFR 600.305(c)(7), the FMCs are strongly recommended to periodically review the their FMPs or FEPs and the best scientific information available (BSIA) to determine if the stocks requiring federal conservation and management are appropriately identified.

### i. 1.1.1 Application of National Standard 1

Section 301(a) of the Magnuson-Stevens Act specifies ten National Standards (NS) for fishery conservation and management and requires the Secretary of Commerce (the Secretary) to establish guidelines to assist in the development of FMPs (i.e., FEPs in the Pacific Islands Region). For fisheries under its authority, National Standard 1 (NS1) requires NMFS to use conservation and management measures for management unit species (MUS)<sup>1</sup> to prevent overfishing while achieving optimum yield on a continuing basis.

The reauthorization of the Magnuson-Stevens Act in 2006 mandated annual catch limits (ACLs) and accountability measures (AMs) that required NMFS to revise the NS1 guidelines to meet these mandates. Further, under a 2009 revision, the Magnuson-Stevens Act required FMCs to amend their FMPs to include mechanisms for specifying annual catch limits (ACLs) for all federally managed fisheries at a level to ensure overfishing does not occur and to implement accountability measures (AMs) such that fishing would adhere to the these limits. On January 16, 2009, NMFS published the NS1 Guidelines (50 CFR 600.310), applicable nationwide, to assist FMCs in determining which stocks are in need of conservation and management (74 FR 3178, January 16, 2009). Under these guidelines, all stocks in an FMP or FEP were considered to be in the fishery, necessitating conservation and management in the form of ACLs and AMs as well as other management measures required under the Magnuson-Stevens Act that the Council and NMFS had established for these stocks.

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<sup>1</sup> Stocks identified as “management unit species” or “stocks in the fishery” are stocks that are in need of conservation and management and are required to have ACLs, AMs, and other provisions as required by the Magnuson-Stevens Act.

The NS1 Guidelines published in 2009 also provide advice on how to identify ecosystem component species (ECS) that, in contrast with MUS, do not require conservation and management and are not subject to ACLs or AMs. The 2009 guidelines define ECS as “non-target species; those not determined to be, or not likely to become, subject to overfishing, approaching overfished, or overfished; or those not generally retained for sale or personal use.” Despite not being subject to ACLs or AMs, the FMCs can monitor the harvest of ECS and reclassify the species as MUS if they determine that conservation and management is warranted.

NMFS revised the NS1 Guidelines in 2016, which provided additional direction regarding ECS and stocks that require conservation and management. While the guidelines clarify that not every fishery requires federal management, those that are predominately caught in federal waters and are also overfished or subject to overfishing, or likely to become overfished or subject to overfishing, are considered to require conservation and management. However, the final rule for the implementation of these revised guidelines states that “if a stock is not predominately (i.e., mainly, or the most part) caught in federal waters, a council may lack the authority, and thus ability, to adopt measures that would prevent overfishing and rebuild overfished stocks. It would not make sense, in that case, to require a council to automatically include the stock in an FMP” (81 FR 71858, October 18, 2016). Additionally, under the 2016 NS1 revisions, FMCs should consider the following ten non-exhaustive factors when deciding whether stocks require conservation and management (50 CFR 600.305(c)(1)(i-x)):

2. The stock is an important component of the marine environment.
3. The stock is caught by the fishery.
4. Whether an FMP can improve or maintain the condition of the stock.
5. The stock is a target of a fishery.
6. The stock is important to commercial, recreational, or subsistence users.
7. The fishery is important to the Nation or to the regional economy.
8. The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.
9. The economic condition of a fishery and whether an FMP can produce more efficient utilization.
10. The needs of a developing fishery, and whether an FMP can foster orderly growth.
11. The extent to which the fishery is already adequately managed by states, by state/federal programs, or by federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law.

The NS1 Guidelines clarify that these ten factors are not all-encompassing in making the determination of whether a stock requires conservation and management (50 CFR 600.305(c)(1)), and thus, FMCs may consider other factors to provide the basis for making this determination (50 CFR 600.305(c)(3)).

The 2016 revision to the NS1 Guidelines redefined ECS as “stocks that a council or the Secretary has determined do not require conservation and management, but desire to list in an FMP in order to achieve ecosystem management objectives” (50 CFR 600.305(d)(13)). Thus, consistent



with section 303(b) of the Magnuson-Stevens Act, National Standard 9, and other applicable Magnuson-Stevens Act sections and laws, NMFS and the FMCs may adopt management measures to, for example, collect data on the ECS, minimize bycatch or bycatch mortality of ECS, protect the associated role of ECS in the ecosystem, and/or address other ecosystem issues, such as habitat impacts (81 FR 71858, October 18, 2016).

Under the section 303(a) of the Magnuson-Stevens Act and the NS1 Guidelines (50 CFR 600.310(e) and 600.310(f)), for each fishery requiring federal conservation and management, the FMC's FMPs or FEPs and the associated stock assessment and fishery evaluation (SAFE) reports must specify or include:

1. Maximum Sustainable Yield (MSY) and Status Determination Criteria (SDC) (e.g., Minimum Stock Size Threshold (MSST) and Maximum Fishing Mortality Threshold (MFMT));
2. Optimum Yield (OY) at the stock, stock complex, or fishery level and provide the OY specification analysis;
3. Acceptable Biological Catch (ABC) control rule, which includes the specification of the Overfishing Limits (OFL);
4. Mechanisms for specifying ACLs and AMs; and
5. Essential Fish Habitat (EFH).

Notably, the above information is not required for ECS in an FMP or FEP. Additional information on the management of MUS and ECS is available in WPFMC and NMFS (2011).

Implementing regulations at 50 CFR 600.305(c)(7) strongly recommend the Council to periodically review the FEP and the BSIA to determine if stock listed therein are appropriately identified, and, as appropriate, stocks should be reclassified within the FEP, added to or removed from the FEP, or added to a new FMP or FEP, through an FEP amendment that documents the rationale for the decision. Additionally, as discussed below, section 306(b) of the Magnuson-Stevens Act describes that the FMCs have limited ability to manage stocks predominately caught in state (i.e., and territorial) waters; as a result, FMCs may identify these stocks as ECS in its FMPs or FEPs (81 FR 71858, October 18, 2016). Further, the NS1 Guidelines strongly recommended that the FMCs consider the extent to which a fishery may already be adequately managed by states (i.e., or territories) that, if in place, would weigh heavily against listing the species in its FEPs (50 CFR 600.305(c)(3)).

#### **i. 1.1.2 Western Pacific Management under National Standard 1**

Prior to the 2006 reauthorization of the Magnuson-Stevens Act, NMFS and the Council managed MUS listed in the Council's FMPs (i.e., Western Pacific MUS) using a variety of conservation and management measures, including prohibitions of destructive gears, area closures, delineation of low-use marine protected areas, and permitting and reporting. The changes associated with this reauthorization of Magnuson-Stevens Act required FMCs to shift their fisheries management towards output control with the introduction of ACLs and AMs. To comply with these new requirements, the Council, in coordination with NMFS, reviewed the MUS in each of its FEP and created an omnibus FEP amendment that described the mechanism by which the Council would specify ACLs and AMs for the American Samoa Archipelago, the Mariana Archipelago

(inclusive of Guam and the Commonwealth of the Northern Mariana Islands, or the CNMI), the Hawaii Archipelago, the Pacific Remote Island Area (PRIA), and Pacific pelagic fisheries. In addition to describing the ACL mechanism, the amendment also adopted exemptions for identified MUS that met the criteria for statutory exceptions from ACLs. The amendment also adopted the ECS classification system but did not identify any ECS at that time. The Council recommended and NMFS approved the FEP amendment, which went into effect on July 27, 2011 (76 FR 37285, June 27, 2011; WPFMC and NMFS 2011).

The 2016 revisions to the NSI Guidelines prompted the Council to review the MUS in each of its archipelagic FEPs to determine whether any of the included species do not require federal conservation and management and would be better suited as ECS. Many of the MUS included in the FEPs at this time were coral reef associated species predominantly caught in territorial waters and not in the US EEZ around American Samoa, the CNMI, Guam, or Hawaii. Additionally, despite NMFS and the Council improving the ACL specification process by generating stock assessments for a range of data-limited species, there remained a substantial administrative burden to continuously specify ACLs for such a large number of stocks (i.e., inclusive of producing data-limited stock assessments, conducting regional peer-reviews, and applying control rules to specify ACLs) that are not predominantly caught in federal waters.

NMFS has limited authority to manage fishing activity for species not predominantly caught in federal waters (i.e., those primarily caught in territorial waters). Section 306(b) of the Magnuson-Stevens Act notes that the Secretary may regulate a fishery within the boundaries of territorial waters pursuant to the applicable FMP or FEP in cases where a stock is predominantly caught in the EEZ. Thus, if a species is not predominately caught in federal waters and exceeds its ACL, NMFS and the Council could reduce the ACL in the subsequent fishing year in accordance with its AM; however, NMFS does not currently have the authority to unilaterally implement AMs or other management measures in territorial waters. Without such authority, ACLs and AMs for stocks not in need of management and predominately caught in territorial waters were unable to provide meaningful management for many of the stocks in the FEPs.<sup>2</sup>

In 2018, the Council drafted Amendment 4 to the American Samoa FEP that reclassified a large number of MUS as ECS (NMFS 2018), and the final rule was published in the *Federal Register* in early 2019 (84 FR 2767, February 8, 2019). This amendment reduced the number of MUS in the American Samoa FEP from 205 species and families to 11, reclassifying these species as ECS and retaining only the BMUS list comprised of an assemblage of emperors, snappers, groupers, and jacks (Table 1). Previously, there were 17 BMUS listed in the FEP. All former coral reef ecosystem and crustacean MUS were reclassified as ECS that do not require ACL or AMs because they were not targeted, were a minor component of the fishery, and were not in need of management; however, these species are still monitored regularly to prioritize conservation and management efforts and to improve the efficiency of fisheries management for the territory and in the region. All existing management measures, including reporting and record-keeping, gear and area prohibitions, and experimental fishing regulations apply to these ECS. If an ECS becomes a target of a federal fishery in the future, NMFS and the Council may

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<sup>2</sup> An exception to this is management of Main Hawaiian Islands (MHI) Deep-7 bottomfish, where fishing in federal waters is managed cooperatively through measures implemented by both the State of Hawaii and NMFS.

consider including that stock as a MUS to actively manage it. These ECS are still regularly monitored via other means (see WPFMC 2022).

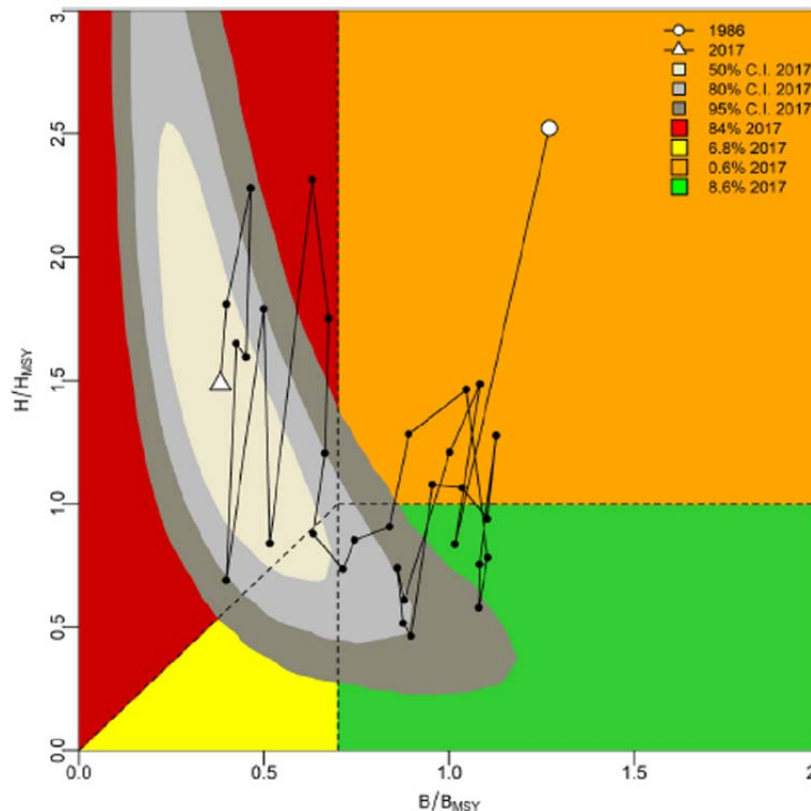
**Table 1: BMUS currently listed in the American Samoa FEP**

Scientific Name	Common Name(s)	Local Name(s)	Family
<i>Aphareus rutilans</i>	Red snapper, silvermouth, lehi	Palu-gutusaliva	Lutjanidae
<i>Aprion virescens</i>	Gray snapper, jobfish	Asoama	Lutjanidae
<i>Caranx lugubris</i>	Black trevally, jack	Tafauli	Carangidae
<i>Etelis carbunculus</i>	Red snapper, ehu	Palu-malau	Lutjanidae
<i>Etelis coruscans</i>	Red snapper, onaga	Palu-loa	Lutjanidae
<i>Lethrinus rubrioperculatus</i>	Redgill emperor	Filua-paomumu	Lethrinidae
<i>Lutjanus kasmira</i>	Blueline snapper	Savane	Lutjanidae
<i>Pristipomoides filamentosus</i>	Pink snapper, paka	Palu-enaena	Lutjanidae
<i>Pristipomoides flavipinnis</i>	Yelloweye snapper	Palu-sina	Lutjanidae
<i>Pristipomoides zonatus</i>	Flower snapper, gindai	Palu-ula, palu-sega	Lutjanidae
<i>Variola louti</i>	Lunartail grouper, lyretail grouper	Papa, velo	Serranidae

#### ii. 1.1.3 Management of American Samoa Bottomfish Management Unit Species

The original American Samoa BMUS list was developed by the Bottomfish Plan Team from 1983 to 1986 as the original FMPs were being developed. The list was created by examining all species caught by bottomfish fishing gear during a bottomfish fishing trip based on limited data from the Western Pacific Fisheries Information Network (WPacFIN) at the time. The Bottomfish Plan Team narrowed the list down to 20 species common across island areas of the Western Pacific region. This BMUS list persisted until the ECS amendment in 2019.

Despite the changes to American Samoa BMUS associated with the ECS amendment in 2019, recent circumstances related to the monitoring and management of the American Samoa bottomfish fishery have further emphasized the importance of periodically reviewing the MUS list in the American Samoa FEP. In August 2019, the NMFS Pacific Islands Fisheries Science Center (PIFSC) completed a stock assessment for the American Samoa bottomfish fishery (Langseth et al. 2019). The assessment was conducted as a benchmark, which means that all components of the assessment analyses were re-evaluated by PIFSC and several changes were made relative to previous assessments of the bottomfish fishery. The assessment results revealed that American Samoa BMUS harvested from federal and territorial waters were both overfished and subject to overfishing based on the status determination criteria (SDC) specified in the American Samoa FEP (WPFMC 2009). This is the first assessment that indicated the American Samoa BMUS were overfished or subject to overfishing (Fig. 2).



**Figure 1: Kobe plot of American Samoa Bottomfish from 1982 to 2017**

Figure 1 presents a Kobe plot of relative biomass and relative exploitation rate from the best fitting production model for American Samoa bottomfish from 1982 to 2017. Colored areas delineate stock statuses (red = overfished and overfishing, yellow = overfished but not overfishing, orange = overfishing but not overfished, and green = not overfished and not overfishing). The gray and tan colored areas refer only to fishing year 2017. The status of the American Samoa BMUS in 2017 is shown in the shaded areas, with different shades depicting different credible intervals as described in the legend. The figure legend indicates the robustness of the different stock status conditions for year 2017 with there being an 84% probability that the American Samoa bottomfish stock is overfished and being subject to overfishing. (Source: Figure 39 in 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 bottomfish in American Samoa are overfished and undergoing overfishing. As required under National Standard 2 of the Magnuson-Stevens Act (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), which 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.

Although the SSC expressed its concerns regarding the impacts of the data used for the stock assessment on its results, the SSC endorsed the stock 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 National Standard 2. On February 6, 2020, NMFS determined that the American Samoa bottomfish stock is overfished and subject to overfishing (85 FR 26940, May 6, 2020). 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 within two years to rebuild the stock.

The Council began the process of developing a rebuilding plan immediately upon notification of the change in the stock status, consistent with section 304(e) of the Magnuson-Stevens Act and implementing regulations at 50 CFR 600.310(j). On November 1, 2019, the Council requested that NMFS develop an interim catch limit (ICL) for the American Samoa bottomfish fishery while the Council worked to develop the rebuilding plan. NMFS implemented an ICL of 13,000 lb for 2020 and 2021 to reduce overfishing in the fishery while minimizing socio-economic impacts to American Samoa fishing communities (85 FR 73003, November 16, 2020 and 86 FR 32361, June 21, 2021). The rebuilding plan set an ACL of 5,000 lb for the American Samoa BMUS with the fishery's first in-season AM and higher performance standard. Under these rebuilding provisions, NMFS would close federal waters around American Samoa to bottomfish fishing for the remainder of the fishing year if NMFS projected that the ACL would be exceeded, and if the ACL was exceeded, NMFS would close the fishery in federal waters until a coordinated management approach was developed to ensure catch in both territorial and federal waters could be maintained at levels that would allow the stock to rebuild.

The American Samoa fishery for BMUS exists in both territorial and Federal waters, and NMFS is obligated to manage the stock throughout its range. Therefore, under the rebuilding plan, NMFS monitored catch from both territorial and federal waters and used the total catch when assessing catch against the ACL. However, the federal catch limit would not limit catch in territorial waters as NMFS was only able to implement fishery management measures within the EEZ. Thus, the development and implementation of the rebuilding plan by the Council and NMFS was complicated by the nature of the BMUS list in the FEP, as several species comprising the list were predominantly harvested in territorial waters where there is no federal authority to unilaterally control catch. This management issue contributed to and further emphasized the need to review the BMUS list in the American Samoa FEP.

### **iii. 1.1.4 Additional Management Components under the Magnuson-Stevens Act**

The ongoing management of BMUS in American Samoa pursuant to the American Samoa FEP and the Magnuson-Stevens Act also requires the consideration of several relevant management provisions that are required to be specified in the Council's FEPs consistent with Section 303(a) of the Magnuson-Stevens Act. These provisions include, but are not limited to, status determination criteria (SDC), essential fish habitat (EFH), ACLs and AMs, monitoring and

bycatch, and fishing communities. The nature of these necessary management components are further described below.

#### **1.1.1.1 Status Determination Criteria**

The Magnuson-Stevens Act National Standard 1 (50 CFR § 600.310 (e)(2)(i)) defines both “overfishing” and “overfished” as states that jeopardizes the capacity of a fishery to produce the maximum sustainable yield (MSY) on a continuing basis. SDC are the measurable and objective factors used to determine if overfishing has occurred, or if the stock or stock complex is overfished (50 CFR 600.310(e)(2)(i)(A)). Overfishing occurs whenever a stock or stock complex is subjected to a level of fishing mortality or total catch that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis, measured using maximum fishing mortality threshold (MFMT), overfishing limit (OFL), or suitable proxies. “Overfished” is a stock or stock complex state where biomass has declined below MSST (minimum stock size threshold) or suitable proxy. MFMT, OFL, and MSST reference points can be established if stock demographic, productivity, and fishery characteristics are known. This is usually achieved through an analysis of historical data using an assessment model. When these characteristics cannot be determined, assumptions are made and proxy reference points are used in place of MFMT, OFL, and MSST.

Overfishing criteria and control rules are specified and applied to individual species within a multi-species stock whenever possible. When this is not possible, they are based on an indicator species for a multi-species stock. It is important to recognize that individual species would be affected differently based on this type of control rule, and it is important that for any given species, fishing mortality does not currently exceed a level that would result in excessive depletion of that species. No indicator species are used for the American Samoa BMUS. Instead, the control rules are applied to the stock complex as a whole.

The MSY control rule is used as the MFMT. The MFMT and MSST are specified based on the recommendations of Restrepo et al. (1998) and both are dependent on the natural mortality rate ( $M$ ). The value of  $M$  used to determine the reference point values is not specified in this section. The latest estimate published annually in the stock assessment and fishery evaluation (SAFE) report is used, and the value is occasionally re-estimated using the best available information. The range of  $M$  among species within a stock complex is taken into consideration when estimating the  $M$  to be used for the purpose of computing the reference point values.

In addition to the thresholds MFMT and MSST, a warning reference point,  $B_{FLAG}$ , is specified at some point above the MSST to provide a trigger for consideration of management action prior to  $B$  reaching the threshold. MFMT, MSST, and  $B_{FLAG}$  are specified as indicated in Table 2.

**Table 2: Current overfishing threshold specifications for American Samoa BMUS**

MFMT	MSST	B <sub>FLAG</sub>
$F(B) = \frac{F_{MSY} B}{c B_{MSY}} \quad \text{for } B \leq c B_{MSY}$ $F(B) = F_{MSY} \quad \text{for } B > c B_{MSY}$	$c B_{MSY}$	$B_{MSY}$
where $c = \max(1-M, 0.5)$		

Standardized values of fishing effort (E) and catch-per-unit effort (CPUE) are used as proxies for fishing mortality (F) and biomass (B), respectively, so  $E_{MSY}$ ,  $CPUE_{MSY}$ , and  $CPUE_{FLAG}$  are used as proxies for  $F_{MSY}$ ,  $B_{MSY}$ , and  $B_{FLAG}$ , respectively.

In cases where reliable estimates of  $CPUE_{MSY}$  and  $E_{MSY}$  are not available, they would be estimated from catch and effort times series, standardized for all identifiable biases.  $CPUE_{MSY}$  would be calculated as half of a multi-year average reference CPUE, called  $CPUE_{REF}$ . The multi-year reference window would be objectively positioned in time to maximize the value of  $CPUE_{REF}$ .  $E_{MSY}$  would be calculated using the same approach or, following Restrepo et al. (1998), by setting  $E_{MSY}$  equal to  $E_{AVE}$ , where  $E_{AVE}$  represents the long-term average effort prior to declines in CPUE. When multiple estimates are available, the more precautionary is used.

Data limited stocks are stocks for which data are not available either to set reference points based on MSY or MSY proxies, or manage to the reference points based on MSY or MSY proxies. Bottomfish fisheries in American Samoa are currently data limited, making the use of proxies the most suitable approach for establishing SDC. The suitability of these proxies depends on how closely a chosen stock or stock complex's characteristics are to the underlying stock and fishery characteristics used to derive the proxies.

#### 1.1.1.1.1 Rate-Based SDC

The calculation and evaluation of reference points for stock status determination depends upon the types of data that are available, the length of time series, and the history of fishing. Much of the previous technical guidance on implementing the provisions of National Standard 1 (Restrepo et al. 1998) was tailored to age-structured assessments. More recently, methods have been developed for application to a wide range of possible scenarios. Some methods lead to the direct estimation of the reference points and others rely on proxy estimates based on other stocks with similar characteristics. The classical method of estimating MSY reference points when sufficient data are available involves estimating (or assuming) a stock recruit curve. If it is not possible to derive a stock recruit relationship or no information is available to estimate one, proxy reference points should be considered based on spawning potential ratio (SPR) calculations. The use of proxies makes specific assumptions about the relative strength of compensatory mechanisms in a stock. If age or length data does not exist, then MSY may be estimated using a surplus production (i.e., biomass dynamics) model (e.g., JABBA; Winker et al. 2018).

Data (e.g., quality, quantity and coverage) and resource (e.g., time, money and technical capacity) limitations present significant challenges to using certain SDC to interpret stocks

status. To address these challenges, there has been a proliferation of data limited methods (DLM) to address the spectrum of data limited situations, with no single approach applicable in all situations. The goal of these DLM is deriving a metric that can be compared to SDC to indicate stock status and/or be associated with catch advice.

In recent years, the most commonly used DLM are those that utilize size composition. Such methods employ a snapshot or time series of biological composition (e.g., relative numbers at length) and life history characteristics to estimate the fishing rate that produced the observed composition. Size composition methods are based on the concept of catch curve analysis. Catch curve analysis measures the total mortality rate,  $Z$ , using the age composition of the catch. With life history information, it is possible to calculate the expected proportion of fish at one age surviving to the next age if only natural mortality ( $M$ ) were occurring. However, the catch curve concept can be applied to size composition data with the use of a growth curve with the use of a growth curve. These types of data limited length-based methods have been established in several assessment software packages (e.g., length-based SPR, Hordyk et al. 2015), including for the Main Hawaiian Islands reef fish stocks (Nadon 2016).

#### **1.1.1.2 Annual Catch Limits and Accountability Measures**

Federal regulations at 50 CFR 665.4 (76 FR 37285, June 27, 2011) require NMFS to implement an ACL and AM(s) for all American Samoa BMUS, as recommended by the Council, and to consider the best available scientific, commercial, and other information about the bottomfish fishery. This section provides an overview of the process the Council used to develop its ACL and AM(s) recommendation for its MUS.

In accordance with the Magnuson-Stevens Act and the FEP, there are three required elements in the development of an ACL. The first requires the Council's Scientific and Statistical Committee (SSC) to calculate an acceptable biological catch (ABC) that is set at or below the stock or stock complex overfishing limit (OFL). The OFL is an estimate of the catch level above which overfishing is occurring and corresponds with the maximum fishing mortality threshold. ABC is the level of catch that accounts for the scientific uncertainty in the estimate of OFL and other scientific uncertainty. To determine the appropriate ABC, the ACL mechanism described in the FEP includes a five-tiered system of control rules that allows for consideration of different levels of scientific information. Tiers 1-2 involve data rich to data moderate situations and include levels of scientific uncertainty derived from model-based stock assessments. Tiers 3-5 involve data poor situations and include levels of scientific uncertainty derived from ad-hoc procedures including simulation models or expert opinion.

When calculating an ABC for a stock or stock complex, the SSC must first evaluate the information available for the stock and assign the stock or stock complex into one of the five tiers. The SSC must then apply the control rule assigned to that tier to determine ABC. For stocks or stock complexes that have estimates of maximum sustainable yield (MSY) and other MSY based reference points derived from statistically-based stock assessment models (Tier 1-3 quality data), the ABC is calculated by the SSC based on an ABC control rule that accounts for scientific uncertainty in the estimate of the OFL. In accordance with Federal regulations at 50 CFR 600.310 implementing National Standard 1 of the Magnuson-Stevens Act, the probability



of overfishing cannot exceed 50% and should be a lower value. The FEP includes a qualitative process by which the Acceptable Risk or Probability of Overfishing (P\*) value may be reduced below 50% by the Council based on consideration of four dimensions of information: assessment information, uncertainty characterization, stock status, and stock productivity and susceptibility. The FEP also allows the SSC to recommend an ABC that differs from the results of the ABC control rule calculation based on factors such as data uncertainty, recruitment variability, declining trends in population variables, and other factors determined relevant by the SSC. However, the SSC must explain its rationale.

The second element requires the Council to determine an ACL that may not exceed the ABC recommended by the SSC. The process includes methods by which the ACL may be reduced from the ABC based on social, economic, and ecological considerations, or management uncertainty (SEEM). A SEEM analysis may also be used to define an ACT. An ACT set below the ACL and ABC further reduces the probability that actual catch will exceed the OFL and result in overfishing.

The third and final element in the ACL process is the inclusion of 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, but are not limited to, closing the fishery, closing specific areas, changing bag limits, or other methods to reduce catch. Post-season AMs address performance of the fishery relative to the ACL, most often addressing an exceedance of an ACL by reducing it for subsequent fishing years. Figure 2 illustrates the relationship between the terms used in this section.

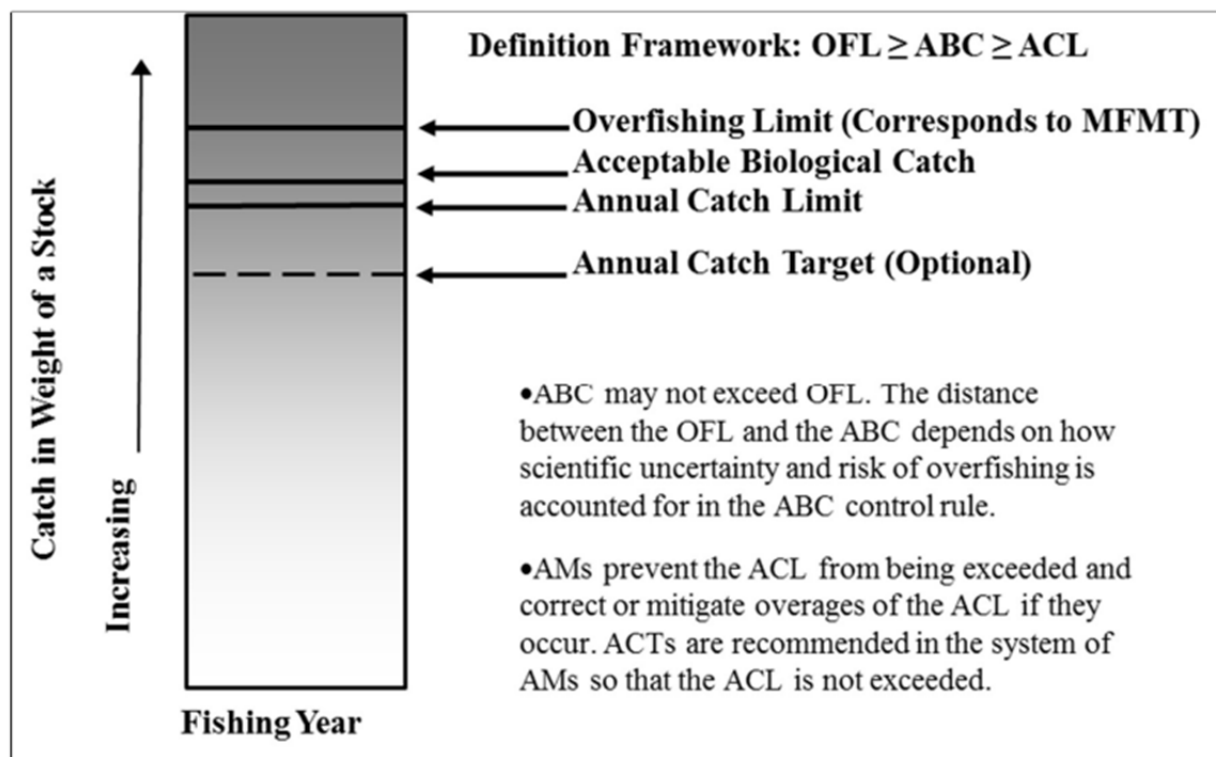


Figure 2: General relationship between OFL, ABC, ACL, and ACT

#### 1.1.1.2.1 50 CFR 600.310(h)(2) (i.e., the “flexibility” provision)

ACLs have been effective management tools for preventing overfishing in many fisheries. However, ACL-based management has been difficult in certain data limited fisheries, including those that lack information on stock biomass and those in which there is limited ability to monitor and enforce fishery removals such as the American Samoa bottomfish fishery. To address these concerns, NMFS amended the NS1 Guidelines in 2016 to clarify that, for certain stocks, including those for which data are not available either to set reference points or manage stocks based on maximum sustainable yield (MSY) or proxies, “alternative approaches” for satisfying statutory requirements other than those set forth in the NS1 Guidelines can apply. NMFS is developing additional guidance to assist with the implementation of alternative approaches and this draft guidance is summarized in this section.

##### *Overview*

The 2016 final rule of the National Standard 1 revisions includes a provision that gives the regional councils flexibility in the application of annual catch limits for data limited stocks (81 FR 71858, October 18, 2016). The Council’s 2011 omnibus Fishery Ecosystem Plan (FEP) amendment established the ACL and accountability measure (AM) specification process in the Western Pacific region. The Council, in consultation with its Scientific and Statistical Committee (SSC), must assign its management unit species (MUS) into various tiers depending on the type, quantity and quality of data available for each species. The tiered system of acceptable biological catch (ABC) control rules that the SSC uses to determine the appropriate ABC under the ACL mechanism described in the FEP requires weight based metrics in the assessment that generates the OFL and succeeding harvest limits.

##### *Stock Exempted from ACLs and AMs*

In 2016, the revised National Standard 1 guidelines described the stocks that are exempt from ACLs and AMs, which are generally species that have a life cycle less than one year or if the Secretary of Commerce (i.e., through NMFS) has determined the fishery is subject to overfishing (50 CFR 600.310(h)(1)(i)). Stock and/or stock complexes that are subject to management under an international agreement are also exempt from ACLs and AMs (50 CFR 600.310(h)(1)(ii)).

An alternative approach that may be practicable in the Pacific Islands Region (PIR) is to use a “rate-based” approach. The key difference between the weight/numbers-based ACLs that have historically been used in the PIR and rate-based ACLs is the metric being monitored and used for triggering AMs (i.e., rate vs. an amount of fish). In the rate-based approach, a metric, such as the mean size of fish in the data, is used to estimate a fishing mortality rate (F) and the maximum fishing mortality rate (MFMT). A lower mean size of fish is generally associated with a higher F, and a higher mean size of fish is associated with a lower F. The mean size is also biologically relevant as an indicator of the percentage of mature fish and the spawning potential ratio (SPR).

The use of either metric would be closely related to the reference points associated with the established SDC for that stock. The SDC control rules would also be amended to allow for the application of the results of new stock assessments. Once a reference point is established, a control rule could express what change in fishing effort is needed to maintain the indicator near

the reference point. Such compensatory mechanisms a control rule is conceptually the same as rules currently used to modify standard (i.e., MSY-based) catch limits and should be predetermined and agreed upon in order to maintain the integrity of the rule.

The decision to use a rate-based ACL for a data limited stock should be based on whether:

1. The stock qualifies for use of the '(h)(2)' flexibilities for data limited stocks (see Section **x.x.x** below);
2. There are sufficient data to estimate the current average fishing mortality rate, or a proxy for F, at MFMT; and
3. It is possible to manage with/enforce a rate-based approach.

If these conditions are met, then the Council could consider a rate-based ACL as an alternative to the standard approach (i.e. weight/numbers).

#### *Flexibility in the Application of ACLs for Data Limited Stocks*

The revised NS1 Guidelines describe the circumstances under which a stock is considered data limited, causing the standard approaches to specification of reference points and management measures to be limited. These are:

1. Stocks that are managed and conserved under the Endangered Species Act;
2. Stocks that are harvested in aquaculture operations;
3. Stocks that have unusual life history characteristics; and
4. Stocks for which data are not available either to set reference points based on MSY or MSY proxies, or manage to the reference points based on MSY or MSY proxies.

Some stocks in the Western Pacific region fall into the fourth category, including the American Samoa BMUS. Despite the ability to determine an estimate of annual catch through the creel surveys and commercial receipt books, these estimates typically have interannual variabilities and associated uncertainties. In the 2019 territorial BMUS stock assessment, the estimates of coefficients of variation for 2017 ranged from 9.5% to 83% depending on the territory (Langseth et al. 2019). Using this catch information in a data-intensive model to generate an MSY estimate as the basis for the OFL results in an ineffective management structure that impedes the development of better approaches to manage the highly variable fishery. The data collection system is also not designed to manage the stock relative to MSY reference points. Although it is possible to come up with an in-season expansion estimate of catch to monitor against the ACL, this usually comes with high variability because there are not enough creel survey interviews to overcome inherent variability in catch estimates. Estimates of catch for small time increments (e.g., months or weeks) are also not regularly available, so it is not possible to accurately project when catch would reach an ACL, nor when an in-season fishery closure would be necessary. Federal management measures to limit catch in the American Samoa bottomfish fishery are also likely to be ineffective due to the geographic distribution of habitat relative to jurisdictional boundaries. For example, over 70 percent of BMUS essential fish habitat in American Samoa occurs in territorial waters. NMFS does not have authority to limit fishing in these waters, which means the American Samoa BMUS cannot effectively be managed using ACLs based on catch in pounds or numbers.

In order to properly guide the utilization of this National Standard 1 provision, NMFS developed technical guidance associated with managing data limited stocks in federal fishery management plans under ACLs and recommendations for implementing 50 CFR 600.310(h)(2) flexibilities for data limited stocks. The guidance defines the circumstances that would allow the use of the flexibility provision of National Standard 1 and provides recommendations to ensure that there is a sufficient buffer to account for uncertainties and progress towards better data and management for data limited stocks.

The technical guidance describes the key factors for a data limited stock: 1) the stock lacks biological information to determine weight/numbers-based reference points (e.g., MSY or its proxies); and 2) the stock cannot effectively be managed under a weight/numbers-based ACL pursuant to the standard approach. The first factor is affected by the absence of reliable removal or life history data and the high intrinsic variability in the data, including incomplete removal series. The most recent stock assessment model assumes total removals, which is not attainable for the Pacific Island region due to lack of reliable data collection in remote areas like the Manua Islands in American Samoa. The assumption of a representative value for total removals can easily be violated with the limitations in the current data collection system, resulting in high uncertainties as mentioned above.

The second factor is affected by the lack of a mechanism to immediately close the fishery associated with the absence of in-season monitoring to inform when a fishery closure should occur relative to the ACL. Even if the fishery is closed in federal waters, it is likely that the fishery would still continue to operate normally in territorial and state waters due to lack of enforcement capability to control catch outside federal jurisdiction. A majority of fish harvested in the U.S. territories are caught by fishers that are non-commercial in nature, making it difficult to track fish flow and ensure all fishing access points are covered by the data collection system.

#### **1.1.1.3 Essential Fish Habitat**

In 1996, Congress passed the Sustainable Fisheries Act, which amended the Magnuson Stevens Fishery Conservation and Management Act (MSA) and added several new fishery management plan (FMP) provisions. Among the most important of these additions was the requirement to holistically identify and describe essential fish habitat (EFH) and, under the EFH final rule, habitat areas of particular concern (HAPC) for all federally managed species (50 CFR 600.815). The MSA defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” HAPC are areas of EFH that meet one or more of the following considerations: (1) ecological function provided by the habitat is important; (2) habitat is sensitive to human-induced environmental degradation; (3) development activities are, or will be, stressing the habitat type; or (4) the habitat type is rare. At the time, the new mandate represented a shift in fishery management to allow regional councils to begin focusing on broader ecosystem-based approaches as opposed to traditional single or multi-species management.

In 1999, NMFS issued guidelines intended to assist Councils in implementing the EFH provision of the MSA and set forth the following four broad tasks:

1. Identify and describe EFH for all species managed under an FMP;

2. Describe adverse impacts to EFH from fishing activities;
3. Describe adverse impacts to EFH from non-fishing activities; and
4. Recommend conservation and enhancement measures to minimize and mitigate the adverse impacts to EFH resulting from fishing and non-fishing-related activities.

Councils also have the authority to comment on federal or state agency actions that would adversely affect the habitat, including EFH, of managed species. Fishery management actions must be evaluated for impacts on all EFH and HAPC in the area of effect and not just the EFH and HAPC for the fishery to which the management action applies.

The EFH guidelines note that a wide range of basic information is needed to identify EFH. This includes data on current and historic stock size, the geographic range of the managed species, the habitat requirements by life history stage, and the distribution and characteristics of those habitats. Since EFH has to be identified for each major life history stage, information about a species' distribution, density, growth, mortality, and production within all of the habitats it occupies, or formerly occupied, is also necessary. According to National Standard 2 guidelines, the stock assessment and fishery evaluation (SAFE) report should summarize the best scientific information available (BSIA) concerning the past, present, and possible future condition of EFH described by the FEPs. The guidelines also state that the quality of available data used to identify EFH should be rated using the following four-level system:

- Level 1: All that is known is where a species occurs based on distribution data for all or part of the geographic range of the species;
- Level 2: Data on habitat-related densities or relative abundance of the species are available;
- Level 3: Data on growth, reproduction, or survival rates within habitats are available; and
- Level 4: Production rates by habitat are available.

The EFH provisions are especially important because of the procedural requirements they impose on both regional councils and federal agencies. First, for each FMP, regional councils must identify adverse impacts to EFH resulting from both fishing and non-fishing activities, and describe measures to minimize these impacts. Second, the provisions allowed regional councils to provide comments and make recommendations to federal or state agencies that propose actions that may affect the habitat, including EFH, of a managed species. In 2002, NMFS revised the guidelines by providing additional clarifications and guidance to ease implementation of the EFH provision by regional councils.

#### **1.1.1.3.1 EFH in the Western Pacific Region**

In 1999, the Western Pacific Regional Fishery Management Council (Council) developed and NMFS approved EFH definitions for management unit species (MUS) under 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 2009, the Council transitioned its five species-based FMPs to five place-based Fishery Ecosystem Plans (FEPs) that carried forward EFH definitions and provisions for all FMP fishery resources into their respective FEPs (75 FR 2198, January 14, 2010). In 2019, Amendment 4 to the American Samoa Archipelago 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 MSA, as these habitat categories only apply to MUS. Discussion and analysis of potential effects on EFH and HAPC would only consider these habitat designations for species remaining as bottomfish MUS (BMUS) in these two territories.

The habitat objective of the FEPs is to refine EFH and minimize impacts to EFH, with the following sub-objectives:

- Review EFH and HAPC designations every five years based on the best scientific information available and update such designations based on the best scientific information available, when available; and
- Identify and prioritize research to assess adverse impacts to EFH and HAPC from fishing (including aquaculture) and non-fishing activities, including, but not limited to, activities that introduce land-based pollution into the marine environment.

As stated in the FEPs, none of the fisheries operating under the American Samoa Archipelago FEP are expected to have adverse impacts on EFH or HAPC for species managed under the different fisheries. Continued and future operations of fisheries under these FEPs are not likely to lead to substantial physical, chemical, or biological alterations to the habitat, or result in loss of, or injury to, these species or their prey (WPFMC 2009a; WPFMC 2009b).

#### **1.1.1.4 Monitoring and Bycatch**

Fishery-dependent data for American Samoa bottomfish are collected through both the boat and shore-based creel surveys as well as the Commercial Purchase Reporting System (CPRS) in each territory. The data collection methodologies are described in the American Samoa annual SAFE reports (e.g., WPFMC 2022). In American Samoa, commercial fish sales must be reported to the Department of Marine and Wildlife Resources before the 16<sup>th</sup> day of each month (ASCA § 24.0905). The CPRS collects information on bottomfish sold to fish dealers, which includes date, dealer name, type of fish/species, weight, price, etc. Typically, only common fish are typically identified to the species level, and the rest are sold in larger groups, such as “miscellaneous bottomfish.” Length information is generally not collected through commercial reports. In some instances, fish are grouped into price categories instead of classifications by fish or species type.

After the passing of the Sustainable Fisheries Act in 1996, section 303(a)(11) of the Magnuson-Stevens Act requires that Council’s FEP establish a standardized bycatch reporting methodology (SBRM) to assess the amount and type of bycatch occurring in the managed fisheries and include conservation and management measures that minimize bycatch and bycatch mortality to the extent practicable. The American Samoa FEP describes bycatch monitoring in American Samoa. The methods for collecting, recording, and reporting bycatch data are comprehensively described in the SBRM created collaboratively by the Council and NMFS (WPFMC 2021). The amount of bycatch recorded in the territorial bottomfish fisheries is described in the annual SAFE reports

for American Samoa (WPFMC 2022; see Section 3.2.2). Data collected on bycatch in the American Samoa bottomfish fishery is not subject to expansion.

#### **1.1.1.5 Fishing Communities**

In 1996, the Magnuson-Stevens Act National Standard 8 specified that conservation and management measures take into account the importance of fishery resources to fishing communities, to provide for their sustained participation in fisheries and to minimize adverse economic impacts, provided that these considerations do not compromise the achievement of conservation. The MSA defines a fishing community as a community that is substantially dependent on or engaged in the harvest or processing of fishery resources to meet social and economic needs, which includes fishing vessel owners, operators, and crew and U.S. fish processors that are based in such a community.

As island communities in the Western Pacific Ocean, the surrounding ocean and its resources have long provided residents of American Samoa with a source of food and opportunities for maritime commerce and recreation. The islands of these territories are relatively small with most towns and villages located along the coast, and the ocean is a constant presence in the lives of all residents. Unlike other regions of the U.S., the settlement of the Western Pacific region was intimately tied to the ocean, which is reflected in local culture, customs, and traditions. Understanding the social and economic connections between residents of the U.S. Pacific Islands territories and the surrounding ocean environment is necessary to describe community life in these areas.

Between 1999 and 2002, the Council recommended that the Secretary of Commerce designate all of the islands of the American Samoa Archipelagos as one fishing community under the MSA (i.e., National Standard 8) because fishery participants tend to live in small towns and villages and because fishing, seafood, and fishing-related businesses hold large social and economic importance in the territory. The NMFS PIFSC has since developed a general profile of the fishing communities in each of these territories (Levine and Allen 2009; Allen and Bartram 2008; Allen and Amesbury 2012).

American Samoa is the only U.S. territory possession in the southern hemisphere, and goods must be transshipped on or over thousands of miles of ocean to reach the archipelago. This has led to a relatively high cost of living and limited availability of certain products and services. The tourism economy is closely related to recreation and leisure opportunities along the shoreline but is also conditioned by the distance of travel to the territory. Various aspects of local and indigenous history, culture, and society are closely related to the surrounding ocean and use of its resources. Fishing activities are important across American Samoa, and residents use living marine resources for commercial sale, household consumption, and cultural ceremonies and traditions. The pertinent economic, social, and community information available for assessing the successes and impacts of management measures or the achievements of the Council's FEPs for the American Samoa Archipelago are provided in the annual SAFE reports (WPFMC 2022). Additionally, the annual SAFE reports identify the various social and economic groups within the region's fishing communities and their interconnections. A selection of adapted information is provided in the following sections, and the full text can be found in the most recent annual SAFE reports (WPFMC 2022).

Magnuson-Stevens Act section 305(i)(2) authorizes the Council and the Secretary of Commerce, through NMFS, to establish a Western Pacific Community Development Program (CDP) for any fishery under the authority of the Council and NMFS. The intent of the program is to provide Western Pacific communities access to fisheries upon which they have traditionally depended but may not have the capabilities to support continued and substantial participation, possibly due to economic, regulatory, or other barriers. The Western Pacific CDP includes two components: (1) the Development Plan Program; and (2) the Demonstration Projects Program. Under the CDP, the Council provides support for fishery projects in Western Pacific and indigenous communities through administrative processes. The Western Pacific Community Demonstration Project Program (CDPP) is a grant program that provides funds to Western Pacific indigenous communities for the demonstration of traditional, cultural fishery, fishery management, and fishery conservation projects.

Each year, PIFSC reports on the status of economic data collections for select regional commercial fisheries. This supports a national economic data monitoring effort known as the Commercial Fishing Economic Assessment Index (CFEAI). The most recent CFEAI metrics available for select regional commercial fisheries in 2021 were generated by the PIFSC small boat surveys conducted in 2021. The small boat survey in American Samoa in 2021 collected data on fishing revenue, operating costs, and fixed costs (i.e., based on Chan and Pan 2019). Additionally, a cost-earnings survey of the American Samoa small boat fishery was completed during 2021. This survey provides updated data on fishing revenues, operating costs, and fixed costs, as well as numerous elements related to fishing behavior, market participation, and fishery demographics for American Samoa boat-based fisheries. PIFSC hopes to have survey results published by the end of 2022. Additionally, community social indicators have been generated for American Samoa (Kleiber et al. 2018) in accordance with a national project to describe and evaluate community well-being in terms of environmental justice, economic vulnerability, and gentrification pressure. However, these indicators rely on Census data and cannot be updated until 2020 Census data becomes available, perhaps sometime in 2022.

## **1.2 Purpose and Need**

The purpose of the proposed action is to adhere to section 302(h) of the Magnuson-Stevens Act and implementing regulations at 50 CFR 600.305(c), which strongly recommend the Council review the BMUS listed in the American Samoa FEP to determine whether they are appropriately identified as in need of conservation and management or if the species should be reclassified, added, or removed from the FEP. The need for this action is to ensure that the BMUS in the American Samoa FEP that are in need of conservation and management are reflective of the current state of the American Samoa bottomfish fisheries, consistent with sections 301(a) and 303(a) of the Magnuson-Stevens Act. This action is also needed to further support the sustainable management of the bottomfish fisheries in American Samoa.

## **1.3 Proposed Action**

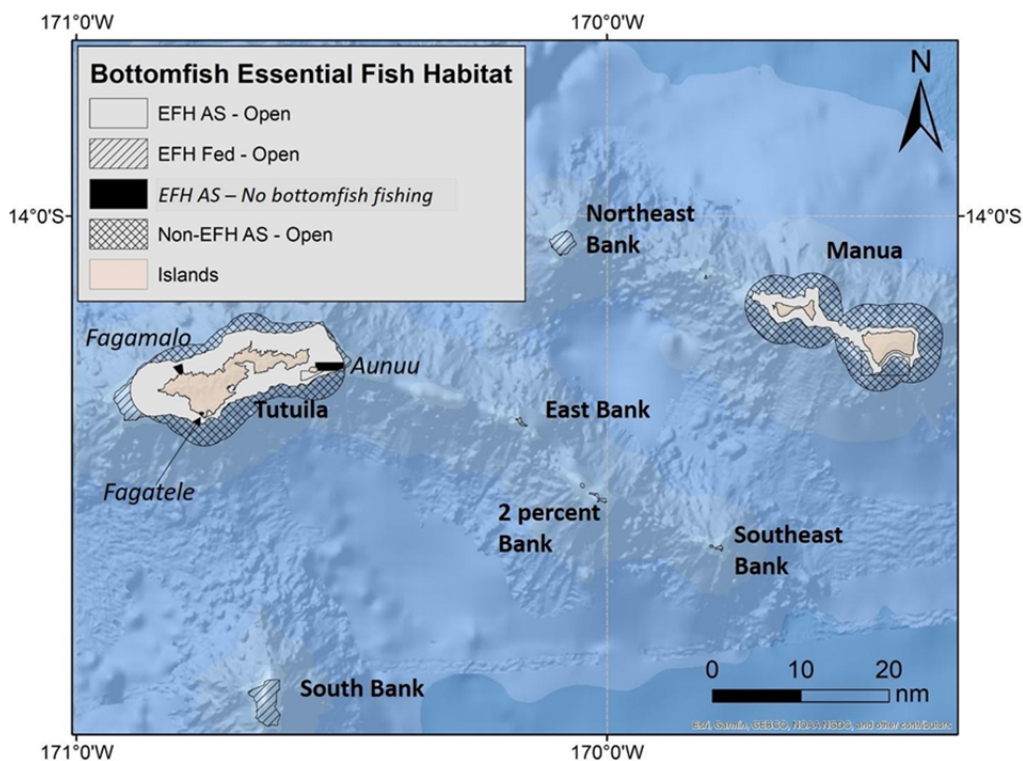
NMFS proposes to approve the Council's recommended Amendment 6 to the American Samoa FEP, which would reclassify several species comprising the current BMUS list in the American Samoa FEP from species in need of federal conservation and management (i.e., MUS) to ECS, and reclassify several non-MUS as BMUS, based on the non-exhaustive ten factors described in 50 CFR 600.305(c)(1) of the National Standard 1 guidelines (81 FR 71858, October 18, 2016)



and other relevant considerations in accordance with the Magnuson-Stevens Act and National Standard 1 Guidelines. The Council recommended changing the classification of five species currently listed as BMUS in the American Samoa FEP to ECS and reclassifying seven species from ECS to BMUS. The proposed action would allow the Council and NMFS to develop and implement ACLs and AMs for MUS predominantly caught in federal waters in need of conservation and management.

#### 1.4 Action Area

The fishery management area for the American Samoa FEP bottomfish fishery includes the EEZ around American Samoa as well as those areas in which fishing for BMUS occurs in the territorial waters of American Samoa. Bottomfish fishing primarily occurs in waters from the surface to 230 m depth around the islands and offshore banks of American Samoa, including Tutuila, Aunu'u, and the Manu'a Islands (i.e., Ta'ū 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 Ta'ū. The fishery does not fish in areas closed to fishing around the islands of Tutuila and Aunu'u, which include several community and territorial marine protected areas (MPAs), including at Fagamalo and several National Marine Sanctuary Management Areas (Fig. 3).



**Figure 3: Map of EFH for bottomfish around American Samoa**  
(Source: NMFS Pacific Islands Regional Office, or PIRO)

## **1.5 Decision(s) to be Made**

This document will support a decision by the Regional Administrator (RA) of the NMFS Pacific Island Region, on behalf of the Secretary of Commerce, whether to approve, disapprove, or partially approve the Council's recommendation. The RA will use the information in this environmental assessment (EA) to make a determination about whether the proposed action would constitute a major federal action that has the potential to significantly affect the quality of the environment. If NMFS determines the action would not significantly affect the quality of the environment, NMFS will prepare a Finding of No Significant Impact. If NMFS determines the proposed action is a major federal action that would significantly affect the quality of the environment, NMFS would prepare an environmental impact statement (EIS) before taking action.

## **1.6 NEPA Compliance**

This 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 June 30, 2021 and accordingly proceeds under the 2020 regulations.

## **1.7 Public Involvement**

The Council convenes many meetings each year, including meetings for its Scientific and Statistical Committee (SSC) and various other advisory bodies. Each of these meetings are open to the public and are noticed in the *Federal Register*, local newspapers and publications, and on the Council's website ([www.wpcouncil.org](http://www.wpcouncil.org)). Meeting agendas provide opportunities for public comment, both oral and written, that are accepted by the Council and its advisory bodies.

The Council discussed the proposed action, the possibility of splitting BMUS lists into shallow- and deep-water segments, and/or the territorial FMPs (tFMPs) that are being developed parallel to the proposed action at the following public meetings:

- The 180th meeting (October 22-24, 2019, 84 FR 53685);
- The 181st meeting (March 9-12, 2020, 85 FR 8568);
- The 185<sup>th</sup> meeting (March 23-25, 2021, 86 FR 11505);
- The 187<sup>th</sup> meeting (September 21-23, 2021, 86 FR 47626);
- The 188<sup>th</sup> meeting (October 19, 2021, 86 FR 54435);
- The 190<sup>th</sup> meeting (March 22-24, 2022, 87 FR 11046);
- The 192<sup>nd</sup> meeting (September 20-22, 2022, 87 FR 53732); and
- The 193<sup>rd</sup> meeting (December 5-8, 2022, 87 FR 68135).
- The 194<sup>th</sup> meeting (March 27-31, 2023, 88 FR 12658).

The SSC considered the proposed action at the following public meetings:

- The 143<sup>rd</sup> meeting (March 15-17, 2022, 87 FR 11046); and

- The 145<sup>th</sup> meeting (September 13-15, 2022, 87 FR 53732).

The proposed action was additionally discussed at the following advisory group meetings:

- The Archipelagic Fishery Ecosystem Plan Team meetings
  - January 23, 2020 (84 FR 72300)
  - April 20-22, 2020 (85 FR 19141)
  - April 20-22, 2021 (86 FR 17367)
  - February 16, 2022 (87 FR 5799)
  - January 25, 2023 (88 FR 1361)
  - April 20-21, 2023 (88 FR 17184)
- The American Samoa Archipelago FEP Advisory Panel meetings
  - September 7, 2021 (86 FR 45710)
  - November 16, 2021 (86 FR 60218)
  - March 8, 2022 (87 FR 9581)
  - June 7, 2022 (87 FR 30890)
  - September 6, 2022 (87 FR 51062)
  - February 28, 2023 (88 FR 8813)

More detailed descriptions of discussions that occurred at public meetings of the SSC and Council are provided below in Section 2.1.1. Further, the topic of designating some stocks and stock complexes as ECS has been discussed in public meetings since 2007, leading to amendments to the American Samoa, Mariana Archipelago, and Hawaii Archipelago FEPs that reclassified various species in need of conservation and management (i.e., MUS) to ECS and resulting in the current BMUS list in the American Samoa FEP (NMFS 2018)

## **1.8 Preparers, Reviewers, and Coordination with Others**

### *Preparers (In alphabetical order)*

Heather Cronin, Fisheries Management Specialist, NMFS PIRO SFD

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The proposed action described in this draft EA was developed in coordination with various federal, state, and local government agencies that are represented on the Council. Specifically, representatives of the following agencies that participated in the deliberation and development of the proposed management measures include the American Samoa DMWR, the US Coast Guard, the US Fish and Wildlife Service, and the US Department of State.

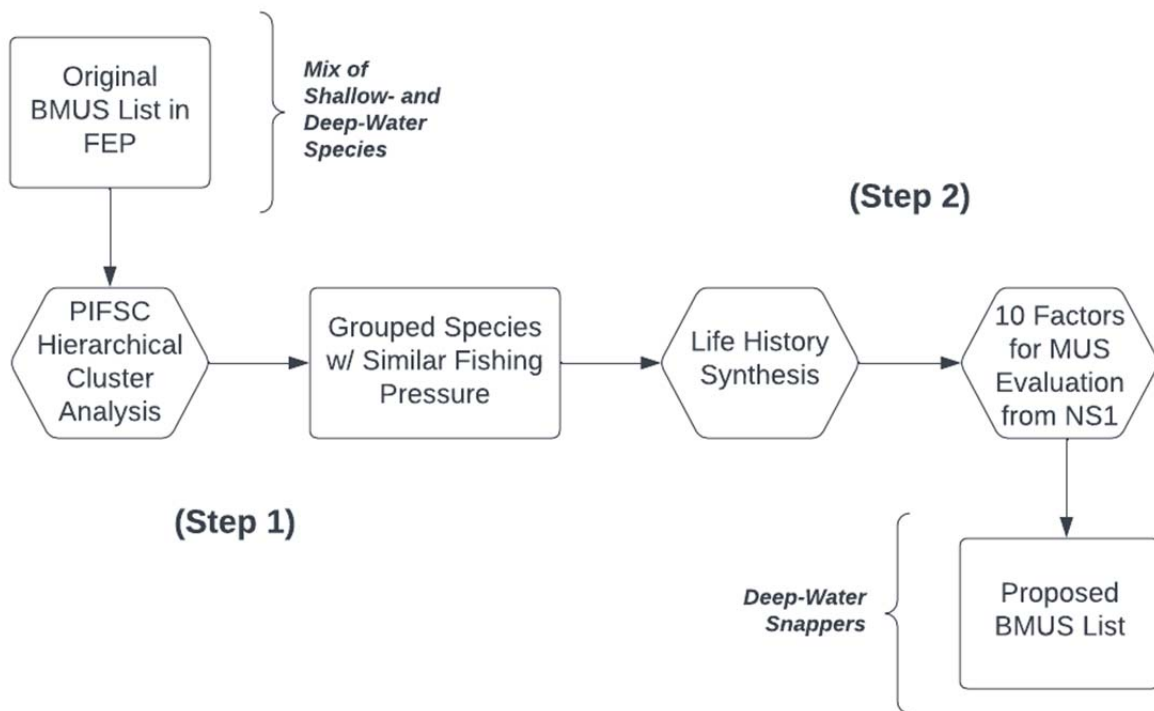
## **2 DESCRIPTION OF THE ALTERNATIVES CONSIDERED**

### **2.1 Development of the Alternatives**

The original American Samoa BMUS list was developed by the Council’s Bottomfish Plan Team for inclusion in the 1986 FMP for Bottomfish and Seamount Groundfish Fisheries in the Western Pacific Region (51 FR 27413, August 27, 1986). The Bottomfish Plan Team determined the list by examining all species caught with bottomfish fishing gear before narrowing the list down to 20 species across island areas based on the most common species in each area; this list included a range of snappers, jacks, groupers, and emperors. The BMUS list remained unchanged until 2019 when Amendment 4 to the American Samoa FEP reclassified a large number of MUS as ECS and reduced the number of MUS from 205 species and families to 11 species. As a result of the FEP amendment, the number of American Samoa BMUS was reduced from 14 to 11 species, which are the same species that comprise the BMUS list in the American Samoa FEP currently.

Section 302(h)(1) of the Magnuson-Stevens Act requires the Council to prepare an FMP for each fishery under its authority that requires conservation and management (16 U.S.C. 1852(h)(1)), but not every fishery requires federal management. “Conservation and management” refers to all of the rules, regulations, conditions, methods, and other methods that are required to rebuild, restore, or maintain any fishery resource and the marine environment (16 U.S.C. 1802(5)). While any stock that is predominantly caught in federal waters and is overfished or experiencing overfishing is considered to be in need of conservation and management, FMCs may determine that additional stocks also require conservation and management. To this end, NS1 provides ten non-exhaustive, guiding factors that the Council should consider when deciding whether other stocks are in need of federal management (50 CFR 600.305(c)). When adding or removing a stock from an FMP or FEP, the NS1 Guidelines require the evaluation of these 10 factors, which, upon review, could lead to a determination that a stock does or does not need Federal management. Stocks that do not require federal management could be removed from the FEP or designated as an ECS through an FEP amendment. Implementing regulations of the Magnuson-Stevens Act at 50 CFR 600.305(c)(7) recommend the Council to review the FEP and the best scientific information available periodically to determine if stocks are appropriately identified.

NMFS and the Council underwent a multi-faceted process to evaluate American Samoa bottomfish species in need of federal conservation and management that can be broken down into two general steps (see Fig. 4). The first step involved PIFSC staff conducting a hierarchical clustering analysis of creel interviews for boat-based fishery operations in American Samoa (Ahrens et al. 2022). The second step involved a thorough review of the results from the cluster analysis by the Council’s Archipelagic Fishery Ecosystem Plan Team (Plan Team; i.e. comprised of federal and state or territorial fishery and ecosystem experts), consideration of these results alongside a synthesis of available life history information, and application of the ten NS1 factors to these candidate species, including considerations for the wide range of life history traits and vulnerability of candidate species, by leveraging expert opinion through Plan Team discussions.



**Figure 4: Review and revision process for BMUS listed in the American Samoa FEP**

### 2.1.1 PIFSC Hierarchical Cluster Analysis

The NS1 Guidelines recommend grouping species into complexes when fisheries target multiple species or when data are limited such that developing ACLs and AMs for every species harvested in a fishery may not be possible. Species in complexes typically have similar geographic distribution, life history characteristics, and vulnerabilities to fishing pressure. Further, the NS1 Guidelines suggest that stock complexes should utilize indicator stocks that are generally representative of the species comprising the complex. Fisheries in the U.S. Pacific Islands territories, inclusive of the American Samoa bottomfish fishery, are generally multi-gear and multispecies by nature, and the data collected from spatially- and temporally-restricted creel surveys may not be always categorized at the species level; these fishery characteristics encourage the use of species complexes in the American Samoa FEP, as have been employed in management of the bottomfish fishery to date.

To this end, the NMFS Pacific Islands Fisheries Science Center (PIFSC) produced a hierarchical clustering analysis of creel survey interview data for archipelagic boat-based fisheries in American Samoa (Ahrens et al. 2022) to delineate species groupings that are experiencing similar fishing pressure. The purpose of this cluster analysis was to adhere to the process implied in the NS1 Guidelines in which species subject to similar fishing pressure are initially identified before further aggregating geographically-similar assemblages based on the ten NS1 factors, life history characteristics, and vulnerabilities to define a complex and indicator species as needed in the American Samoa FEP. Because the Magnuson-Stevens Act and NS1 Guidelines encourage FMCs to periodically review stocks listed in an FMP or FEP to ensure conservation and

management goals are being adequately met, the PIFSC cluster analysis provided a transparent and repeatable process by which NMFS and the Council can ensure that the FEP appropriately aligns with the current state of the fishery.

The clustering analysis aimed to identify species assemblages that are likely subject to similar fishing pressure under the assumption that species that are captured together are likely subject to similar fishing effort and can be considered as occurring in the same fishery. The analysis utilized American Samoa boat-based creel survey data from 1986 to 2019 that were converted into presence and absence by species for each interview. Data were assessed according to three date ranges of 1986-2019, 2010-2019, and 2016-2019, coinciding with notable changes to the creel survey program in the territory. Additionally, the analysis was conducted for each time block using all available data as well as a subset of the data containing only trips declared as bottomfish fishing.

In describing their findings, Ahrens et al. (2022) focused on species currently listed as BMUS in the American Samoa FEP. The association between different species were generally determined by the primary gear type used to harvest the species with some overdistribution as a result of mixed gear categories. The analysis found that pelagic species harvested by trolling clustered together in a consistent manner across time blocks, and shallow reef-associated species caught using spear also group together in a similar manner. Perhaps most pertinently, bottom-associated species tended to clustered based on depth preference and gear type, as bottomfish typically occur in deeper depths and require heavier gears (e.g., *Aphareus rutilans*, *Etelis carbunculus*, *E. coruscans*, *Pristipomoides flavipinnis*, *P. zonatus*, *P. filamentosus*). These deeper bottomfish clustered apart from moderate depth species harvested using lighter tackle or spear (e.g., *Aprion virescens*, *Lethrinus rubrioperculatus*, *Lutjanus kasmira*). The analysis did not explicitly identify species to be added as BMUS in the American Samoa FEP, but acted as a scientific baseline from which fishery scientists and managers could base their deliberations and identification of candidate BMUS. Additional information regarding the results of the hierarchical clustering analysis is provided in Appendix X.

### **2.1.2 Archipelagic Plan Team Contributions**

The Council's Archipelagic Plan Team initially discussed the potential action to revise territorial BMUS lists in the FEPs at its intersessional meeting in January 2020 (84 FR 72300) and its subsequent regular meeting in April 2020 (85 FR 19141) in response of the Council's recommendation at its 180th meeting in October 2019 that an options paper be developed for the revision of the BMUS lists in the FEPs. At these meetings, the Plan Team expressed the need to revisit the categorization of the territorial BMUS lists, inclusive of the list for American Samoa, to determine if alternative groupings could be generated based on available biological and fishery data. Through discussions at these meetings, the idea of regrouping the BMUS lists was deliberated alongside the idea of reclassification, as it was not clear to the Plan Team at that time that an FEP amendment may be the most appropriate course of action.

The Plan Team continued discussing the potential action to revise the territorial BMUS lists at its April 2021 meeting (86 FR 17367). At this meeting, representatives from the NMFS Office of Sustainable Fisheries attended the meeting and presented guidance on which stocks require federal conservation and management, changing stock status from known to unknown, and

indicator stocks in light of the NMFS Procedural Guidance 01-101-11 released in November 2020. If a stock is overfished or experiencing overfishing and is predominantly caught in federal waters, it likely requires federal management; conversely, if the stock is healthy or is not caught predominantly in federal waters, then the 10 non-exhaustive factors from the NS1 Guidelines can be considered with discretion to determine if federal management may still be required. Relatedly, the Plan Team discussed whether territorial BMUS lists should be examined to determine if they align with provisions of the Magnuson-Stevens Act and are representative of the current state of the bottomfish fisheries. Plan Team members noted the need to consider life history, distribution, and vulnerability information alongside the evaluation of the 10 guiding factors when revising the BMUS lists to ensure they adequately characterize the managed fisheries. The idea of a clustering process to help decide species aggregations in light of these parameters was noted. The Plan Team ultimately recommended the formation of a working group with membership from PIFSC, PIRO, the Council, and the territorial resource management agencies to analyze the existing data relevant to potential revisions for the territorial BMUS lists in their respective FEPs and to develop an options paper for review at a future Plan Team meeting.

The Plan Team working group first convened on August 16, 2021 as an initial step to discuss the potential action to revise the territorial BMUS lists in their respective FEPs stemming from the Plan Team recommendation. Working group members noted that the potential action could represent an opportunity to ensure that the BMUS lists are reflective of the current bottomfish fisheries in American Samoa, Guam, and the CNMI and align with provisions of the Magnuson-Stevens Act. The working group discussed the historical background of the territorial bottomfish fisheries and BMUS lists, the notions of stock complexes and indicator species, and the need to understand fishing pressure and which species are harvested together. Preliminary results of the PIFSC clustering analysis were presented for American Samoa alongside an associated mapping exercise that indicated that 21.9% of bottomfish habitat exists in federal waters such that federal fishery management could theoretically only protect this proportion of the bottomfish population around American Samoa. Working group members generally endorsed the clustering analysis approach and approved the described path forward of supplementing the analysis with a synthesis of life history information at a subsequent working group meeting and soliciting additional feedback from the fishing communities and other stakeholders.

The Plan Team working group met again on January 26, 2022 to review the overlay of aggregated life history information with the results of the clustering analysis (Ahrens et al. 2022), to review available data evaluation reports, to discuss the species that could be included or removed from the territorial BMUS lists, and to determine potential MUS based on the 10 guiding factors provided in the NS1 Guidelines. A point of emphasis during the meeting was that the revision of the territorial BMUS lists is linked to additional provisions that must be specified for MUS pursuant to the Magnuson-Stevens Act, including SDC, ACL specification mechanisms, EFH, bycatch information, data collection procedures, and fishing community information. It was also emphasized that species reclassified from MUS to ECS in the FEPs would continue to be managed under tFMPs that are currently being developed by the territorial resource management agencies. The working group discussed what appeared to be a division between shallow- and deep-water bottomfish species in the cluster analysis for American Samoa,



indicating that there may be patterns in fishers' targets between the two groups (i.e., deep-water snappers and shallow-water emperors).

Additionally, at its January 2022 meeting, the Plan Team working group noted that there is a distinctive fishery for deep-water snappers that is at least somewhat reflective of the partition between federal and state waters since deeper species are more likely to be targeted and harvested in federal waters. Additionally, with respect to life history, species of the genera *Etelis* and *Pristipomoides* are more similar to each other than to other current or proposed BMUS. The working group discussed removing shallow-water species such as jacks and emperors from the BMUS list. It was noted that *P. flavipinnis* and *P. filamentosus* did not cluster with the rest of the deep-water snappers likely due to issues with sample size given that they are relatively rare in the American Samoa bottomfish fishery. The working group also discussed the inclusion of *Aphareus rutilans* due to its clusters and life history characteristics as well as *Etelis boweni* due to it likely being present in the data but not appearing in the analysis because of the lack of species identification. Ultimately, the working group determined that the starting point in using the results of the clustering analysis for developing a new BMUS list for the American Samoa FEP would be the clustered deep-water snappers that have similar life history and are predominantly caught in federal waters as a single fishery before reviewing and verifying the list with local fishers. Despite establishing an initial proposal for a revised species list based on life history and distribution, some working group members remained undecided on how to best move forward with an objective, science-based approach, and the working group decided to have another meeting preceding the next full meeting of the Archipelagic Plan Team.

The Plan Team working group reconvened on February 14, 2022 and reviewed the ongoing processes to evaluate and revise the territorial BMUS lists, inclusive of the species listed in the American Samoa FEP. Since the previous working group meeting in January 2022, members made progress summarizing available data that could inform the BMUS list revisions, including on the current BMUS, clusters resulting from the analysis, minimum and maximum depth ranges for candidate species, and consideration of the NS1 Guidelines' 10 guiding factors for species that may require federal conservation and management, especially factors 3 and 10 for these species. The working group discussed several species in particular that required additional deliberation, such as *Aprion virescens*, *Caranx lugubris*, and *Variola louti*, which is a current BMUS most typically characterized as "intermediate-depth." It was noted that there appears to be a clear depth distribution in the territories where all the strictly deepwater species are snappers, and most deep-water snapper habitat is situated in federal waters.

The working group discussed the addition of other deep-water snappers not already included as MUS on the American Samoa BMUS list, noting they would have similar life histories and that little information would be required for management or more rare species since the use of indicator species would facilitate management. The working group noted the importance of objectivity in adding deep-water species to the proposed BMUS list based on the clustering analysis if they were willing to reclassify shallow-water species. Thus, the working group also proposed the addition of several species to the revised BMUS list in the American Samoa FEP based on the results of the cluster analysis, life history synthesis, and working group discussion, such as deep-water snappers *Paracaesio stonei*, *P. kuskarii*, *Etelis boweni* and several species of *Pristipomoides*. The working group suggested that emperors, groupers, and lutjanids currently



comprising the BMUS list be considered for reclassification from MUS to ECS since they are predominantly caught where their habitat is situated in shallower waters with the understanding that these species would be managed under tFMPs being developed by each territorial resource management agency (i.e., the DMWR in American Samoa). The working group noted that the goal for the subsequent meeting of the Archipelagic Plan Team was to achieve consensus on the proposed revisions to the territorial BMUS.

Shortly thereafter, the Plan Team held an intersessional meeting on February 16, 2022 (87 FR 5799) during which the Plan Team took inventory of available data to inform the revision of the territorial BMUS lists and deliberated the potential options for the proposed list revisions. The Plan Team working group presented relevant evaluations to the full Plan Team, including the American Samoa bottomfish data evaluation, the clustering analysis, the life history synthesis, the consideration of the 10 non-exhaustive factors from the NSI Guidelines, and review by DMWR representatives, with a meeting goal of reaching consensus about which species should be included in the revised lists before making headway on Magnuson-Stevens Act management components that need to be addressed and performing community engagement. Other considerations by the Plan Team for species to include in the proposed lists were species that occur in both territorial and federal waters (e.g., *Aprion virescens*, *Variola louti*, and *Caranx* spp.) and species with declining catch over time.

The Plan Team discussed that the proposed action to revise the BMUS list is not solely about changing the species, as there are associated ramifications and decisions to be made. After determining the final BMUS lists, there will be additional decisions about managing at the species level, as a complex, or using indicator species. For any of these choices, the APT must determine SDC and ACL provisions (i.e., potentially rate-based), redefine EFH, address bycatch, identify data streams, and consult fishing communities. Ultimately, at its February 2022 meeting, the Plan Team reached consensus and recommended that the proposed species (see Table 2) be considered for Council approval to comprise the proposed federal BMUS in American Samoa based on the results of the hierarchical clustering analysis and the synthesis of life history information. The Plan Team further recommended that the Council endorse five new Plan Team working groups relevant to identified Magnuson-Stevens Act management components that must be addressed alongside the proposed action to revise the BMUS list in the American Samoa FEP: stock SDC, EFH, ACLs and AMs using 50 CFR 600.310(h)(2), monitoring and bycatch, and fishing communities. The members of these working groups were charged with helping to compile information relevant for this FEP amendment.

#### **2.1.2.1 Evaluation of Magnuson-Stevens Act Management Components**

Consistent with the Plan Team recommendation that was adopted by the Council at its 192nd meeting in March 2022, five Plan Team working groups began reviewing and aggregating information pertinent to the five overarching Magnuson-Stevens Act management components to be considered during the preparation of this FEP amendment and environmental assessment for the proposed action. The deliberations and approaches of the component working groups are described in further detail below, and the resulting changes to relevant management provisions are described in Section 2.2.2.

#### **2.1.2.1.1 Status Determination Criteria**

The SDC component working group met on June 6, 2022 in tandem with the ACL/AM component working group to discuss possible changes to management provisions as they relate to SDC in consideration of the proposed action to revise the BMUS list in the American Samoa FEP. The working group discussed that the implementing regulations of the Magnuson-Stevens Act describes the features of MSY and SDC (50 CFR 600.310(e)), and each of the Council's FEPs require specification of SDC and overfishing and overfished determinations (50 CFR 600.310(e)(2)(ii)). NS1 Guidelines also state that "when data are not available to specify SDCs based on MSY or MSY proxies, alternative types of SDCs that promote sustainability of the stock or stock complex can be used." Moreover, if alternative types of SDCs are used, the Council should explain how the approach will promote sustainability of the stock complex on a long-term basis. The working group sought to describe the proposed alternative type of SDC that could be used for data limited stocks (i.e., rate-based SDC; see Section 2.2.2).

In its resulting report, the working group noted that MSY and other components of SDC all require the determination of an underlying stock-specific production function. This is usually accomplished, at a minimum, within a stock assessment framework using an index of abundance, typically derived from fishery dependent information including CPUE and total catch. For data limited fisheries, such as the American Samoa bottomfish fishery, the estimates of CPUE and catch have high variability due to the nature of data collection in the fishery. The limited quantity and quality of fishery-dependent information sets into question the reliability and representativeness of these data, particularly when determining the stock status based on MSY.

The working group noted that National Standard 1 provides flexibility in the application of ACLs for data limited stocks (50 CFR 600.310(h)(2)) such as the American Samoa BMUS. The Technical Guidance on this provision was developed by NMFS and provides recommendations for the development of alternative status determination criteria (Macpherson et al. 2022). The Technical Guidance provides direction on the application of a rate-based approach, which this EA describes in detail.

#### **2.1.2.1.2 Annual Catch Limits, Accountability Measures, and the Flexibility Provision**

The ACL/AM component working group met on June 6, 2022 alongside the SDC component working group to discuss possible changes to the framework to specify ACLs and related AMs utilizing provision at 50 CFR 600.310(h)(2) (i.e., the "flexibility provision") in consideration of the proposed action to revise the BMUS list in the American Samoa FEP. During meeting discussions and in its component report, the working group identified several key points and considerations relevant to the implementation of the flexibility provision with respect to the specification of alternative ACLs for American Samoa BMUS. These considerations include:

- When an approved alternative approach is used in place of a standard-approach ACL, it must satisfy the ACL requirement under the Magnuson-Stevens Act.
- The Council must document their rationale for any alternative approaches in an FEP or FEP amendment, which NMFS would review for consistency with the Magnuson-Stevens Act.
- If an alternative ACL is approved, there is no need (nor reasonable expectation) to then convert that alternative back into an amount of fish.

- The choice of data limited methods should be based on what aspect of the fishery can be measured.
- The type of information provided by PIFSC as the BSIA in stock assessments would be used as a basis for rate-based ACLs, as is done for standard-approach ACLs. The upcoming stock assessments may use different methods for different species, so the type of specified ACLs may differ among species within the territorial BMUS lists.
- Noting that the National Standard 1 guidelines require an alternative approach to be contained within the FEP, if it is anticipated that the Council will need to make a determination of which approach to use within a short time-frame, such as when new data become available, then it may be appropriate to consider establishing a framework within the FEP to allow for such determinations.
- Translating the change in percent effort into a particular or a suite of effort controls needs specific thought and attention, and is often best designed using simulation testing.
- Strong buffers should be used in data limited situations due to increased uncertainty.
- Catch-scalar methods (i.e., setting catch based on a percent of previous catches) have been shown to lead to poor management results, and are a less preferable management option compared to rate-based ACLs.

The working group recommended that the Council establish an alternative control rule allowing for the implementation of a rate-based ACLs in the American Samoa FEP for its bottomfish fishery consistent with regulations at 50 CFR 600.310(h)(2) and applicable guidance from NMFS (see Section 2.2.2).

#### **2.1.2.1.3 Essential Fish Habitat**

The EFH component working group met on June 30, 2022 to discuss possible changes related to EFH in consideration of the proposed action to revise the BMUS list in the American Samoa FEP. The working group discussed available sources of information for informing EFH designations for American Samoa BMUS, including the species recommended to be added to the list under this proposed action. The working group noted in its report that PIFSC also completed a thorough evaluation of all published reports related to life history and habitat (depth, substrate, feeding) for BMUS species of shallow-and deep-water snappers found in American Samoa; none of the data summarized in those reports would support changes to the current EFH levels of information for American Samoa bottomfish. The working group concluded, based on the Magnuson-Stevens Act definition of EFH and its associated description in the FEPs, the proposed action to revise the BMUS list in the American Samoa FEP would have little effect on the designation of EFH required to be specified in the FEPs. The working group noted that while it is possible that bottomfish EFH definitions may need to be slightly revised to better reflect species being added to the BMUS list, there may not be data available to describe the depth distribution of newly added species. Additionally, shallow-water BMUS that would be reclassified as ECS would need to have their EFH designations removed.

#### **2.1.2.1.4 Monitoring and Bycatch**

The Monitoring and Bycatch component working group met on June 27, 2022 to discuss possible changes related to EFH in consideration of the proposed action to revise the BMUS list in the American Samoa FEP. The main topics of discussion included that the proposed list revisions

themselves would require minimal changes in data collection methods for commercial reports but offers an opportunity to refine the creel survey design to allow for alternative management approaches, such as rate-based ACLs using length information (see above). By removing the shallow-water bottomfish species from the BMUS lists, data collection would be able to prioritize data from the boat-based creel surveys because the likelihood of catching a deep-water bottomfish using a shore-based gear is very low barring juvenile deep-water species harvested in shallow-water habitats.

The working group concluded that the proposed action to revise the territorial BMUS list in the American Samoa FEP to generally retain deep-water species and reclassify shallow-water species is necessary for the FEP to reflect the current state of the fisheries. Further, the working group determined that the proposed action to revise the territorial BMUS lists would not impact how the fishery is conducted, nor would it be likely to influence fishery bycatch rates since the fishers' target bottomfish species would likely remain the same (i.e., targets would not be likely to change based on a federal action to revise the BMUS list in the FEP). The working group noted several improvements that could be implemented to improve the interception rate of bottomfish fishing trips during the catch interview phase of the creel surveys to increase the likelihood of capturing a representative sample of bottomfish catch data to support the potential implementation of rate-based monitoring (see above) in lieu of the currently implemented catch-based monitoring associated with tracking catch against a specified ACL.

The working group also recommended several changes to current data collection methodologies and considerations associated with the proposed action to revise the territorial BMUS list. These recommendations included augmenting the length-based monitoring of catch from bottomfish fishing trips by ensuring the species in the proposed BMUS list are properly identified and measured for length (and weight if possible); encouraging the data collection staff at American Samoa DMWR to collect length information, prioritizing the proposed BMUS list; developing technological solutions to support length-based monitoring, including through the use of mobile devices equipped with image recognition technology to identify and optically measure fish length; and conducting training sessions for data collectors to improve their fish identification for the proposed BMUS list, and develop methodologies to ensure a random selection of subsamples for length measurements.

#### **2.1.2.1.5 Fishing Communities**

The Fishing Communities component working group met on June 28, 2022 to discuss if the proposed action to revise the BMUS list in the American Samoa FEP would have any pertinence on management provisions related to Pacific Islands fishing communities as defined under the Magnuson-Stevens Act. Through their discussions at the working group meeting as well as the descriptions in its resulting component report, the working group ultimately determined that the proposed action would not be likely to have any notable impacts on Pacific Islands fishing communities, their definitions or description in the FEP, associated data collection efforts, and indigenous fishing community programs such as the CDP or CDPP. There are no other changes necessary regarding fishing communities under the proposed action, though the working group did encourage that the Council account for the change in American Samoa BMUS in its annual stock assessment fishery evaluation (SAFE) report.

### 2.1.3 Council and SSC Meetings

The Council and SSC discussed the proposed action to revise the BMUS list in the American Samoa FEP, including the use of ECS designations and addition of new MUS, at the following meetings:

- At the 180th Council meeting in October 2019, the Council received a recommendation from the Guam Advisory Panel (AP) for the Council to request PIFSC to separate the shallow water bottomfish complex from the deep water bottomfish complex. The AP also emphasized a recommendation from the Data 2000 Workshop in 1996 to “investigate methods for separating and analyzing data and information on the shallow and deep bottomfish complexes.” In response to the results of the 2019 territorial bottomfish stock assessment and ongoing issues surrounding the territorial bottomfish fisheries, the Council directed staff to develop an options paper for the revision (i.e., regrouping) of the BMUS complexes in the American Samoa Archipelago and Mariana (i.e., Guam and CNMI) Archipelago FEPs, which accounts for the stock throughout its range in the case of the Mariana Archipelago bottomfish fisheries, and to present the options paper at a future Council meeting.
- At the 181st Council meeting in March 2020, regarding the potential action to regroup the territorial BMUS, the Council initially identified a path forward by selecting a management option that would retain the flexibility in the application of the control rules for the BMUS and requested Council staff to work with PIFSC and the territorial resource management agencies to review the BMUS lists and discuss the available options and regulatory consequences of adding and removing species from the lists.
- At the 185<sup>th</sup> Council meeting in March 2021, the Council recommended the American Samoa DMWR continue the development of its Territorial Fishery Management Plan and work with the community and pertinent agencies to approve and implement the plan. Additionally, the Council recommended NMFS find a viable solution to provide flexibility in the management of data limited stocks, as well as engage the fishing communities in American Samoa to explain how the data from the territory data collection program is generated, summarized and used in the stock assessment as part of the Data Workshop in 2021 for American Samoa.
- At the 187<sup>th</sup> Council meeting in September 2021, the American Samoa AP encouraged the DMWR to complete the tFMP in order to provide sustained participation in the fishery and to provide food for the community. The Council endorsed the recommendation and requested the DMWR to develop conservation and management measures to ensure coordinated management between territorial and federal jurisdictions. Further, the Council requested that the plan include improvements in fishery data collection to enhance fishery science and management in the future.
- At the 188<sup>th</sup> Council meeting in October 2021, the Council directed staff to work with the American Samoa DMWR to initiate dialogue and information exchange with the Ministry of Agriculture and Fisheries in Samoa on the management and data sharing for

local bottomfish fisheries. The goal of this recommendation was to bolster the data limited fishery in American Samoa through improved communications across the Samoa Archipelago.

- At the 143<sup>rd</sup> SSC meeting and 190<sup>th</sup> Council meeting in March 2022, the SSC and Council received a recommendation from the American Samoa AP regarding the options paper to revise territorial BMUS lists in their respective FEPs. The American Samoa AP stated that flexibility is necessary for the fishery and that Option 2, which involved revising the territorial BMUS lists based on the PIFSC cluster analysis and life history synthesis, was the most flexible. At the 143<sup>rd</sup> SSC meeting, the SSC also recommended Option 2 and supported the refinement of the BMUS in the FEPs by reclassifying shallow-water species as ECS. The SSC also recommended that the species that are reclassified as ECS be included in the tFMPs. The SSC also acknowledged that the change in the composition of the territorial BMUS lists would trigger revisions to various requirements for MUS under the Magnuson-Stevens Act. At its 190<sup>th</sup> meeting, the Council also selected Option 2 to revise the American Samoa and Guam BMUS lists based on the results of the cluster analysis and the life history synthesis, utilize the flexibility of the current FEP control rule, and apply the control rule at the appropriate level for the revised BMUS list depending on available data. Additionally, the Council endorsed the Archipelagic Plan Team working groups to provide the information to support the different sections of a potential BMUS revision amendment to the FEPs, which includes status determination criteria, essential fish habitat, ACL and AMs, monitoring an bycatch, and fishing communities. Lastly, the Council directed staff to convene meetings of the Archipelagic Plan Team working groups to report on progress of their respective Magnuson-Stevens Act provisions in preparation for community and stakeholder engagement associated with the proposed action.
- At the 145<sup>th</sup> SSC meeting and 192<sup>nd</sup> Council meeting in March 2022, the SSC and Council acknowledged comments from their APs that they look forward to the community and stakeholder engagement anticipated to occur related to the proposed action to revise the territorial BMUS lists in the American Samoa and Mariana Archipelago FEPs. At the 145<sup>th</sup> SSC meeting, the SSC emphasized the importance of community and stakeholder engagement and the need to follow cultural protocols during local meetings. Council staff indicated they will work with the local social scientists to ensure all cultural protocols are followed during community and stakeholder engagement. At the 192<sup>nd</sup> Council meeting, the Council directed staff to refine the Archipelagic Plan working group reports on Magnuson-Stevens Act provisions related with the proposed action and conduct community engagement in Guam, the CNMI, and American Samoa. Additionally, the Council directed staff to work with PIFSC and fishing communities in the Mariana Archipelago to further review the inclusion of *Etelis boweni* and *Pristipomoides argyrogrammicus* within the proposed BMUS lists. *Etelis boweni* is a newly described species in the region and members of the fishing community expressed that they would like more detailed information on catch histories to better understand the stock. *Pristipomoides argyrogrammicus* was noted to be less commonly caught in the BMUS complex despite being described as possible MUS through the cluster analysis.

Similar to *E. boweni*, the community was interested in more information being presented on the *P. argyrogrammicus* catch history.

- At the 193<sup>rd</sup> Council meeting in December 2022, the Council reviewed the final Magnuson-Stevens Act component reports and directed staff to convene an action team with participation by PIFSC, PIRO, and the territorial resource management agencies (i.e., DMWR, DAWR, and DFW) to begin drafting the FEP amendment for the proposed action to revise the territorial BMUS lists.
- At its 194<sup>th</sup> meeting in March 2023, the Council received a status update on the progress of the development of the proposed action to revise the territorial BMUS lists in the FEPs. The Council directed staff to incorporate the Archipelagic Plan Team recommendations for the BMUS revisions into a draft FEP amendment to be considered for initial action by the Council at its meeting in June 2023 that would include proposed revisions to Magnuson-Stevens Act management provisions such as EFH, SDC, and ACLs and AMs. The Council recommended that the BMUS revisions begin with the American Samoa FEP before continuing with similar revisions to the BMUS list in the Mariana Archipelago FEP as new stock assessments for the Guam and CNMI BMUS are made available. Relatedly, the Council recommended that PIFSC work with the territorial resource management agencies to implement length-based monitoring protocols and ensure that the species proposed BMUS lists could be identified and measured for length (and weight if possible) during fishery-dependent surveys through training sessions for data collectors. The Council also requested PIFSC to develop technological solutions to support this length-based monitoring (e.g., mobile devices equipped with image recognition technology to identify and optically measure fish-length) and recommended that its Archipelagic Plan Team update the annual SAFE reports consistent with the proposed BMUS list, if approved.

At its 195<sup>th</sup> Council meeting in June 2023, the Council will review the alternatives developed by the Action Team and the Archipelagic Plan Team. The Council may choose to take initial action and select a preliminarily preferred alternative to be further analyzed in an amendment to the American Samoa Archipelago Fishery Ecosystem Plan.

## **2.2 Description of the Alternatives**

The alternatives considered in this EA were developed by the Council in collaboration with NMFS and the American Samoa DMWR pursuant to Magnuson-Stevens Act requirements as part of a review of the MUS listed in the American Samoa FEP. The alternatives apply to the current BMUS list in the American Samoa FEP (see Table 1). The alternatives are based on the hierarchical clustering analysis developed by NMFS PIFSC as well as in consideration of the criteria provided in the NS1 Guidelines for classifying ECS, other criteria such as life history characteristics and vulnerability, and further deliberation by the Council at its 192<sup>nd</sup>, 193<sup>rd</sup>, and 194<sup>th</sup> meetings. The summary of the analytical process for reclassifying species from MUS to ECS and from ECS to MUS is described in Section 2.1. Because the hierarchical cluster analysis is the BSIA and because there exists no other analyses with which a different, science-based BMUS list could be developed, there are two potential alternatives: Alternative 1 (status quo)

and Alternative 2 (action alternative). Alternative 1 is the No Action alternative that acts as the environmental baseline and does not meet the purpose and need for the proposed action. Alternative 2 would revise the BMUS list in the American Samoa FEP by reclassifying five of the current bottomfish species as ECS and adding seven new bottomfish ECS to the list as MUS, as further described below. A summary of the alternatives is provided in Table 4.

### **2.2.1 Alternative 1: No Action (Status Quo/Current Management)**

Under the No Action Alternative, the Council and NMFS would not recommend or implement changes to the existing BMUS list in the American Samoa FEP. Management of the BMUS would continue to include annual specifications of ACLs and AMs, including for those species comprising the list that are not predominantly caught in federal waters and are not overfished or subject to overfishing.

#### Expected Fishery Outcomes

Under Alternative 1, the American Samoa fisheries for BMUS would continue to operate as they have in recent years with respect to location, target and non-target species, catch, effort, fisher participation, gear composition, seasonality, intensity, and bycatch. Similarly, NMFS would continue to manage the BMUS using ACLs and AMs. NMFS and the Council would continue to monitor BMUS catches and continue to work with American Samoa DMWR to collaboratively manage these species across federal and territorial waters.

#### Fishery Management and Administration

The Council and NMFS would continue to manage all BMUS in the American Samoa FEP pursuant to the requirements for managing stocks in the fishery specified in the Magnuson-Stevens Act. This includes, but is not limited to, specifying MSY, specifying ACLs and AMs, establishing SDC and associated reference points, and designating and refining EFH. The predominant harvest for several species in the BMUS list would persist in territorial waters. For these species not predominantly caught in federal waters, the ACLs and AMs specified by NMFS and the Council for these species would continue to require increased scientific and administrative resources, likely without observable conservation and management benefits.

Under Alternative 1, NMFS PIFSC would continue to conduct stock assessments for the current 11 BMUS, and the Council would continue recommending ACLs and AMs on an annual or multi-year basis while reporting annual catches in the annual SAFE reports. NMFS and the Council would continue to prioritize these BMUS for additional research within the Magnuson-Stevens Act Five-Year Research Priorities. NMFS, the Council, and the American Samoa DMWR would continue to regularly monitor the catch of all current BMUS.

Also under Alternative 1, there would be no change to the EFH designations for BMUS as they currently exist. Federal agencies would continue to be required to consult with NMFS for any proposed project that may adversely affect EFH in accordance with the Magnuson-Stevens Act. The Council would continue to perform periodic reviews of EFH and HAPC.



## 2.2.2 Alternative 2: Amend the American Samoa FEP to Reclassify Five Current BMUS as ECS and Seven Current Non-MUS as BMUS

Under Alternative 2, NMFS and the Council would amend the American Samoa FEP to revise the current BMUS list (see Table 1), reclassifying five of the former BMUS as ECS and seven non-MUS (i.e., a mix of ECS and species currently not listed in the FEP) as new MUS.

Alternative 2 would expand the current list of 11 BMUS to a new BMUS list of 13 species. The species reclassified as ECS would be identified as not in need of conservation and management based on the NS1 Guidelines. Similarly, those species added to the BMUS list would be identified as being predominantly harvested in federal waters and in need of conservation and management. The Council recommended the proposed reclassifications in consideration of the hierarchical cluster analysis (Ahrens et al. 2022) and Plan Team deliberations, which included utilizing the ten factors described in 50 CFR 600.305(c)(1) of the NS1 guidelines discussed in Section 2.1.2. Table 3 provides the proposed BMUS list in the American Samoa FEP under Alternative 2.

**Table 4: Proposed BMUS in the American Samoa FEP under Alternative 2**

Scientific Name	Common Name(s)	Local Name(s)	Family
<i>Aphareus rutilans</i>	Red snapper, silvermouth, lehi	Palu-gutusaliva	Lutjanidae
<i>Etelis boweni</i>	Red snapper, giant ehu	-	Lutjanidae
<i>Etelis carbunculus</i>	Red snapper, ehu	Palu-malau	Lutjanidae
<i>Etelis coruscans</i>	Red snapper, onaga	Palu-loa	Lutjanidae
<i>Paracaesio kuskarii</i>	Saddle-back snapper	Palu-tuauli, mu-sina	Lutjanidae
<i>Paracaesio stonei</i>	Cocoa snapper	-	Lutjanidae
<i>Pristipomoides argyrogrammicus</i>	Blue banded gindai, jobfish	Palu-tusimoana	Lutjanidae
<i>Pristipomoides auricilla</i>	Goldflag jobfish	Palu-i`usama, palu-ave	Lutjanidae
<i>Pristipomoides filamentosus</i>	Pink snapper, paka	Palu-ènaèna	Lutjanidae
<i>Pristipomoides flavipinnis</i>	Yelloweye snapper	Palu-sina	Lutjanidae
<i>Pristipomoides multidens</i>	Goldbanded jobfish	Palu-pa`epa`e, palu-sina-ugatele	Lutjanidae
<i>Pristipomoides sieboldii</i>	Pink snapper, kalekale	-	Lutjanidae
<i>Pristipomoides zonatus</i>	Flower snapper, gindai	Palu-ula, palu-sega	Lutjanidae

### Expected Fishery Outcomes

Under Alternative 2, we do not expect changes in the conduct of the American Samoa bottomfish fishery. The proposed action to designate some BMUS as ECS and some non-MUS as BMUS is inherently administrative in nature and is not likely to directly impact or change the fishery in terms of location, target and non-target species, catch, effort, fisher participation, gear composition, seasonality, intensity, or bycatch. Further, due to waning participation in the fishery in recent years, it is not likely that implemented ACLs and AMs functionally constrained the fishery for the species proposed to be reclassified as ECS. Thus, we expect the American Samoa bottomfish fishery to continue operating as it has in recent years. The Council and NMFS would continue to monitor catches of ECS in the annual SAFE reports and would continue to work with the American Samoa DMWR to ensure their sustainable management in territorial waters via ecosystem-based fishery management approaches and through the tFMP.

### Fishery Management and Administrative Outcomes

The provisions of Alternative 2 would facilitate improved management and scientific efficiencies by focusing available resource on stocks that are predominantly caught in federal waters that require conservation and management pursuant to NS1 Guidelines. Under this alternative, NMFS and the Council would continue to manage the MUS listed in the American Samoa FEP in accordance with the Magnuson-Stevens Act, implementing regulations, and the FEP. NMFS would continue to conduct stock assessments for the species lists as MUS, inclusive of species newly classified as MUS under this alternative, and the Council would continue to recommend annual or multi-year ACLs and AMs for these MUS. NMFS and the Council would continue to monitor the fishery performance and ecological conditions relevant to the MUS in the American Samoa FEP through the annual SAFE report for the American Samoa Archipelago (e.g., WPFMC 2023), and considerations for the MUS under Alternative 2 would be emphasized under Magnuson-Stevens Act Five-Year Research Priorities.

Under Alternative 2, five species currently listed as MUS in the American Samoa FEP (i.e., *Aprion virescens*, *Caranx lugubris*, *Lethrinus rubrioperculatus*, *Lutjanus kasmira*, and *Variola louti*) would be reclassified as ECS (see Appendix X) in accordance with the Council's determination that they are not in need of federal conservation and management. The abilities for NMFS and the Council to collect and monitor fishery data for ECS would not be impacted, and through data provided in the annual SAFE reports, NMFS and the Council would be able to continue monitoring the fishery performance of the most caught and highest priority (i.e., as identified by local resource management agencies) ECS in addition to the ecosystems and habitats that sustain them. The regular and continued monitoring of these data streams would inform potential future management actions and options as deemed necessary by NMFS and the Council.

#### **2.2.2.1 Additional Management Components under the Magnuson-Stevens Act**

Associated with the proposed action to revise the BMUS list in the American Samoa FEP, there are several proposed changes to the management provisions pertinent to the American Samoa bottomfish fishery that are required to prescribe under the auspices of the Magnuson-Stevens Act. Section 303 of the Magnuson-Stevens Act lists required contents of FMPs (i.e., necessary management provisions) that would apply to the species newly listed as BMUS under

Alternative 2 but would not apply to the species being reclassified from MUS to ECS. These fishery management components include establishment of SDC, designation of EFH, specification of ACLs and AMs, identification of fishing communities, establishment of standardized bycatch reporting methodology, and specification of pertinent data sources to be submitted to the Secretary of Commerce, among others.

Under Alternative 2, these provisions would no longer apply to *Aprion virescens*, *Caranx lugubris*, *Lethrinus rubrioperculatus*, *Lutjanus kasmira*, and *Variola louti*, but the seven species reclassified as MUS would need to be managed under these Magnuson-Stevens Act requirements (i.e., ACLs, EFH, etc.). However, regulations for ECS in the FEPs related to ecosystem-based management, such as permitting, record-keeping, and reporting requirements to monitor ECS catch, could remain in place at the discretion of NMFS and the Council. The combination of permits and reports would allow NMFS to continue to monitor potential fishing impacts to ECS as well as to protect the associated role of ECS and address other ecosystem issues (50 CFR 600.305(c)(5) and (12); 16 U.S.C. § 1853(b)(12)).

Further, under Alternative 2, NMFS and the Council would supplement the American Samoa FEP with additional management mechanisms associated with the revised species list, requirements the under Magnuson-Stevens Act and the NS1 Guidelines, and the best available scientific information. Several key management components prescribed by the Magnuson-Stevens Act are considered, including implementing SDC, revising EFH, specifying ACLs and AMs, evaluating changes to fishing communities, and refining fishery and bycatch monitoring data streams. The proposed changes to these key Magnuson-Stevens Act management components in the American Samoa FEP under Alternative 2 and their expected outcomes are described in detail in subsequent sections of this document below. Additionally, Appendix X provides the proposed regulatory text changes under Alternative 2.

#### **2.2.2.1.1 Status Determination Criteria**

The proposed action to revise the territorial BMUS lists would not impact provisions of the Magnuson-Stevens Act that require SDC be established for all federally-managed stocks and stock complexes. The proposed action would require that SDC be evaluated in consideration of the proposed revisions to the BMUS list in the American Samoa FEP, effectively adding additional deep-water species and reclassifying shallow-water species. Thus, under Alternative 2, a new approach for SDC would be established for American Samoa BMUS that would allow for stock status determination to be made based on rate-based (i.e., length-based) analytical approaches.

Under Alternative 2, the overfishing SDC (i.e., the MFMT) for composition-based DLM are the same as presented for dynamic age-based assessments. Both are based on the selected %SPR proxy for that stock or collection of stocks in an FMP. The SDC units can be in terms of %SPR itself (e.g., SPR45%) or in terms of the F that would produce that SPR level. It is preferable to keep the SDC in terms of %SPR, which allows the associated F to be updated as life history information is improved as a result of new assessments. The overfishing status determination can then be made with no special modifications associated with it being derived from a DLM. Thus, under Alternative 2, flexibility would be implemented into the FEP to allow the PIFSC Stock

Assessment Program discretion in deciding approaches to the application of overfishing SDC to the American Samoa BMUS based on the data available.

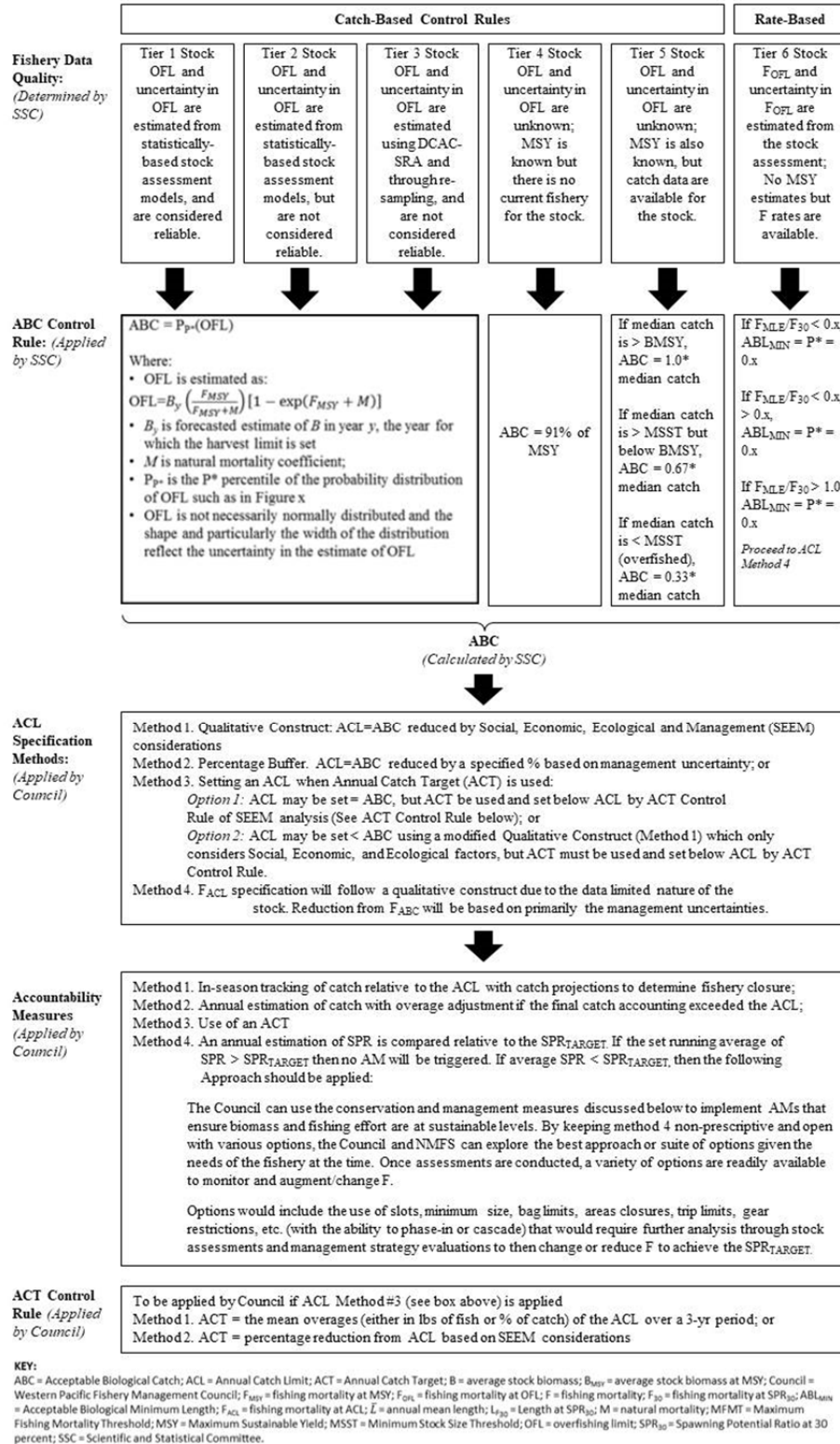
Regarding overfished SDC under Alternative 2, NMFS previously did not support the use of SPR-based measurements in the application of SDC to make an “overfished” determination. However, the 2022 version of the National Standard 1 guidelines recognizes the need for SDC alternatives when conventional approaches cannot be applied, including the consideration of rate-based alternatives to ACLs. As length composition data directly relate to the degree to which the relative abundance of older fish has been reduced below a reference level, these data would be sufficient to develop an alternative MSST. If the current stock and fishery have been relatively stable for at least a generation time, then the recently obtained measure of SPR has probably been the SPR for several years. So, such an SPR would be both a measure of the recent F that created this stock condition and a measure of the current condition of the stock relative to an unfished stock. The MSST can be translated into units of SPR to enable comparisons to the current measure of SPR. If the stock’s current SPR has fallen below this rate-based MSST, then there is a very high probability that it is overfished. The suitability of the SPR-MSST translation depends upon the characteristics of the stock being assessed relative to the characteristics of the example stocks used in the construction of the SPR-MSST relationship. Ultimately, the suitability of the SPR-MSST relationship would depend on the strength of the compensatory mechanism of the stock in question. Thus, under Alternative 2, flexibility would also be implemented into the FEP to allow the PIFSC Stock Assessment Program discretion in determining whether to use rate-based or more traditional SDC in the management of the American Samoa BMUS.

#### **2.2.2.1.2 ACLs/AMs/50 CFR 600.310(h)(2) Provision**

Under the proposed action to revise the American Samoa BMUS list under Alternative 2, the Council would establish an alternative control for rate-based ACLs in the American Samoa FEP (see Fig. 5) consistent with regulations at 50 CFR 600.310(h)(2) and applicable guidance from NMFS. As described in Section 1.1.4, the current state of the data collection system and management structure for the American Samoa bottomfish fishery meets the data limited conditions such that the American Samoa BMUS are eligible for invoking the 50 CFR 600.310(h)(2) provision that allows the Council to propose alternative approaches for satisfying the requirements of the Magnuson-Stevens Act other than those set forth by the NS1 Guidelines (81 FR 71858, October 18, 2016). Therefore, the Council is documenting its rationale for proposing the implementation of the alternative approach through this FEP amendment that establishes the alternative approach using a rate-based limit alongside the revised BMUS list.

Under Alternative 2, the alternative approach would follow the general ACL mechanism and process described in Amendment 2 to the American Samoa Archipelago FEP and the final implementing regulations at 50 CFR §665.4 (76 FR 37285, June 27, 2011). The process starts with the generation of a stock assessment that utilizes the rate-based reference point. The rate-based reference point for the alternative approach is further described in Section 2.2.2.1.1 above. The stock assessment would provide an estimate of the sustainable fishing level that would prevent overfishing from occurring, which would be equivalent to the overfishing limit in an MSY-based system. The assessment would also generate a probability of overfishing (P\*) based on the change in effort levels required to prevent overfishing.

The Council developed a tiered system of control rules to guide the specification of ACLs and AM (WPRFMC 2011). These data are categorized into the different tiers in the control rule ranging from Tier 1 (i.e., most information available, typically a stock assessment) to Tier 5 (i.e., catch-only information). A Tier 6 ABC control rule has been developed for the proposed rate-based alternative approach. The five tiers under the existing ABC control rule all utilize weight-based harvest limits, whereas Tier 6 would utilize a different control rule geared toward data limited stocks. Simulation testing should be conducted going forward to determine the percent change in fishing effort that would be used as the framework for the control rule.



**Figure 5: Schematic of proposed method for setting ABCs and specifying ACLs and AMs under Alternative 2**

*Calculating ABC*

The 2011 omnibus amendment to the FEP established the ACL specification mechanism for all MUS in the Pacific Islands (WPRFMC 2011). The ACL mechanism includes the control rules for setting ABCs and specification of ACLs, including an option for setting ACTs. Stocks are designated at various tiers depending on the quality of the data and inherently the type of assessments that would be developed. Tier 1-5 are all catch-based, and therefore MSY-based, control rules that also utilize catch estimates in the accountability measures. Tier 6 would establish the control rule for the rate-based alternative approach. The rate-based approach would be an input-control mechanism rather than the output control such as weight-based ACLs. The difference between Tier 6 and Tier 2, which utilizes rate-based approaches like Yield-per-Recruit (Y/R) and Spawning-per-Recruit (SPR) expressed as  $F_{30}$  and  $F_{60}$ , is that Tier 6 rate metrics are derived from length estimates rather than removals associated with fish harvest.

The minimum average length for a representative sample of a fish stock that is associated with that stock having a 50 percent probability that overfishing is occurring ( $L_{OFL}$ ) is generated through the stock assessment.  $L_{ABC}$  is reduced from  $L_{OFL}$  using a predetermined range set by the SSC based on the ratio of  $F$  for the mean length estimate ( $F_{MLE}$ ) over  $F$  that reduces spawning biomass per recruit to 30% of the unfished value ( $F_{30}$ ). The closer the  $F_{MLE}/F_{30}$  value is to 1, the lower the  $P^*$ . The range is determined through simulation testing that the SSC would review. See Figure 5 for more details on the ranges. The SSC would review the outcome of the assessment and apply the control rules. There is no  $P^*$  analysis required as for stocks of Tiers 1-3. Each  $P^*$  level would have a corresponding  $L_{F30}$  that would serve as the minimum size at the chosen  $L_{ABC}$ .

### *Specifying ACLs*

The ACL specification process under Tier 6 would involve method 4 (see Figure 5). Similar to the general ACL specification process, the Council could review the  $L_{ABC}$  and apply a buffer to account for other sources of uncertainty (i.e., only management uncertainty in this particular case) to specify the  $L_{ACL}$ . Tier 6 focuses only on the management uncertainty because of the data limited nature of the stock where the efficacy of implementing proper management for these stocks would rely on effective monitoring, compliance, and enforcement. The scoring would follow the structured Social, Economic, Ecological and Management (SEEM) Uncertainty Analysis process developed by Hospital et al. (2019) but with focus only on the management dimension.

### *Specifying AMs*

The Tier 6 control rule would utilize rates that have an inherent lag effect compared to the control rules from Tiers 1-3, which utilize catch-based AMs where the catch is known (especially if in-season AMs are used) and can be monitored against the ACL. Since the  $F$  would be based on length for Tier 6, the Council and NMFS would monitor the SPR derived from annual average length and  $F$  compared to that length with the  $SPR_{TARGET}$ . At the end of each fishing year, PIFSC would calculate the annual average length,  $F$ , and SPR. Tier 6 would likely utilize method 4 for the specification of AMs (Figure 5).

Length-based control rules are sensitive to annual changes in length, which can be affected by selectivity and changes in fishing effort. Recognizing the variabilities associated with this approach, a three-year running average of the SPR would be used, similar to the catch-based

approach that typically employs a post-season overage adjustment. The three-year average SPR would be compared to the  $SPR_{TARGET}$  determined by the SSC. NMFS technical guidance recommends a range of SPR between 0.3 to 0.4 that would ultimately be determined by the SSC.

The AMs are designed to be a stacked set of management measures that could bring the SPR above the  $SPR_{TARGET}$  within a single fishing year as necessary. The management measure(s) applied to the following fishing year would depend on how much less the three-year average SPR is relative to the  $SPR_{TARGET}$ . All provisions would be geared to reduce F and prevent overfishing from occurring. There are various management measures (e.g., seasonal and area closures, bag limits, gear restrictions, minimum size and slot limits, etc.) that could be applied to reduce catch rates within the American Samoa BMUS fishery. However, minimum size is one measure likely not appropriate to employ for bottomfish, as doing so would likely lead to substantial mortality for regulatory discards as a result of barotrauma for deep-water snappers.

Given the data limited nature of the American Samoa BMUS fishery, the proposed AMs are a suite of non-prescriptive measures that can be applied after a thorough review of the biological reference points. To aid in the decision making process, AMs should be considered as part of the assessment. Reviewing a suite of AMs through a scientific process (e.g., WPSAR, management strategy evaluation, etc.) that is then vetted through the Council process (i.e., public, advisory panel, SSC, and Council review) would offer flexibility in the tools managers could use to more efficiently implement AMs to support increasing biomass with minimal consequences to fishery operations or development.

The Council could use the following conservation and management measures (identified under method 4 in Fig. 5) to implement AMs that ensure biomass and fishing effort are at sustainable levels. Slots, minimum size, bag limits, areas closures, trip limits, gear restrictions, and other possible measures (with the ability to phase-in or cascade) are management measures that would require further analyses to better understand the impact on the stock and its biological reference points. For example, if the resulting F leads to an SPR below the  $SPR_{TARGET}$ , a process would be initiated for the Council's Plan Teams to develop options that would then be vetted through the Council and its advisory bodies before being submitted to NMFS Office of Sustainable Fisheries for final approval. By keeping method 4 non-prescriptive with various options, the Council and NMFS could explore the best approach or suite of approaches given the needs of the fishery at the time. Additionally, once stock assessments become available, a variety of options would be readily available to monitor and augment the estimate of F.

#### **2.2.2.1.3 Monitoring and Bycatch**

Under Alternative 2, the potential implementation of SDC and ACLs/AMs that use a rate-based approach (see Section 2.2.2.1.1 and 2.2.2.1.2 above) would necessitate a greater emphasis on the collection of size information rather than catch by weight and/or numbers in the existing data collection systems. The creel survey catch interviews include the measurement of fish length (in millimeters) and weight (in grams). The implementation of length-weight measurements is dependent on several factors: 1) fishers allowing the data collectors access to their catch; 2) managers or surveyors determining the amount of fish to be measured; and 3) the ability of surveyors to randomly select individual fish for measurement. Length estimation would be the primary metric to support the usage of SPR to monitor fishery performance against the rate-



based ACL. Additionally, under Alternative 2, no changes would be required for bycatch monitoring because deep-water BMUS tend to be preferred targets that are kept for both commercial and non-commercial purposes (WPFMC 2022) and this is not anticipated to change.

#### **2.2.2.1.4 Essential Fish Habitat**

Regarding EFH under Alternative 2, the proposed species on the revised BMUS list would assume the same EFH designation as the current BMUS (see Table 3). This would not prevent the EFH designations for these newly listed species from being refined in the future based on the best scientific information available. A cursory literature review on the information available for the proposed BMUS that could be used to inform a refinement of the EFH designation is provided in Appendix #.

#### **2.2.2.1.5 Fishing Communities**

The proposed action to revise the territorial BMUS lists would not impact provisions of the Magnuson-Stevens Act related to fishing communities, including the definition of island fishing communities, the descriptions of Pacific Island fishing communities in the FEPs, or indigenous programs offered to island fishing communities. However, the proposed action would change the MUS that would be covered under programs such as the CDP and CDPP; criteria for eligibility would otherwise remain unchanged for indigenous fishing communities in the territories. Additionally, the potential action to revise the American Samoa BMUS list is not likely to have any adverse impacts on the social, cultural, or economic aspects of the bottomfish fisheries in American Samoa, would not impact the ongoing initiative to document empirical observations from fishers, and would not impact socioeconomic research and data collection efforts by PIFSC going forward.

#### **Expected Fishery Outcomes**

In consideration of the additional Magnuson-Stevens Act management components proposed for implementation alongside the revised BMUS list in the American Samoa FEP under Alternative 2, we expect that the proposed action would be unlikely to result in adverse impacts to the fishery, its operations, or its fishers due to the administrative nature of the action. Indirect impacts from the proposed updates to these provisions are possible if the change to the management component results in a change to how the fishery is managed; for example, if the implementation of rate-based ACLs results in overages that would not occur under weight-based limits, there may be subsequent actions that would impact the fishery (e.g., ACL overage adjustment; fishery closures).

#### **Fishery Management and Administrative Outcomes**

The proposed administrative and management changes under Alternative 2 have more likely and tangible outcomes than are expected to be observed on the fishery itself. Due to the administrative nature of reclassifying MUS within the Council's FEPs, there are not many quantifiable fishery impacts, but the proposed action could result in increased management and administrative efficiencies as well as closer adherence with the Magnuson-Stevens Act, implementing regulations, and other applicable statutes. The utilization and implementation of

management frameworks that offer more flexibility to fisheries managers (i.e., through the addition of the previously described Tier 6 control rule) would allow for more directed management to be applied to the bottomfish fisheries of the Western Pacific region while supporting the data collection streams necessary to continuously monitor them.

### 2.2.3 Summary Comparison of Features of Alternatives Considered

Table 5 provides a comparison of features of the proposed alternatives.

**Table 6: comparison of the features of alternatives**

Topic	Alt. 1 - No Action	Alt. 2 - Proposed Action
Short topic:	Retain the BMUS list in the American Samoa FEP as it currently exists.	Amend the American Samoa FEP to reclassify five BMUS as ECS and seven non-MUS as BMUS; amend additional Magnuson-Stevens Act management components
Would the FEPs list MUS and ECS?	Yes. The FEP would retain its current lists of MUS and ECS.	Yes. The FEP would continue to list MUS and ECS, but the lists would be revised to be reflective of the proposed reclassifications.
Would the reclassified species be subject to new management measures?	N/A (baseline).	Yes. Species reclassified as ECS would not be in need of federal conservation and management and would not be subject to required provisions under the Magnuson-Stevens Act such as ACLs, AMs, SDC, EFH, etc. Conversely, species reclassified as MUS would be subject to specification of ACLs and AMs, establishment of SDC, designation of EFH, etc., in accordance with applicable guidelines under the Magnuson-Stevens Act.
Any species or stock removed from the FEP?	N/A (baseline).	No. Species reclassified off of the BMUS list would remain in the FEP as ECS.
Any species or stock added to the FEP or moved into a different fishery?	N/A (baseline).	Yes. Under the proposed action, three of the species to be added as BMUS were not previously listed in the FEP as ECS: <i>Etelis boweni</i> , <i>Pristipomoides argyrogrammicus</i> , and <i>Paracaesio kuskarii</i> . The other four species proposed to be added to the BMUS list previously existed as ECS in the FEP.
<b>Fishery Management Changes (Overview)</b>		
Would catches be monitored?	Yes. All MUS are currently subject to monitoring.	Yes. MUS catch would still be monitored, and ECS catch would be subject to monitoring in the annual SAFE report for the American Samoa Archipelago.

Topic	Alt. 1 - No Action	Alt. 2 - Proposed Action
Would permits be required?	Permits would continue to be required for any fishery that necessitates permits under the American Samoa FEP. However, no permits are necessary to fish for American Samoa BMUS in territorial or federal waters around the archipelago.	No permits would be necessary to fish for American Samoa BMUS in territorial or federal waters around the archipelago. For ECS, the permit requirements would depend on the species or stock, and the species reclassified as ECS under this action would have no associated permit requirements.
Would prohibitions such as gear restrictions, area restrictions, and closures still exist?	Yes, for MUS. Requirements for the American Samoa bottomfish fishery may be found in the FEPs, as amended, and under CFR Part 665 Subparts A and B.	Yes, for MUS and ECS that have such requirements now. Requirements for the American Samoa bottomfish fishery may be found in the FEPs, as amended, and under CFR Part 665 Subparts A and B.
Would OFL, ABC, ACLs and AMs be required?	Yes, for all current MUS.	Yes, for all MUS, including new inclusions to the American Samoa BMUS list. This alternative would include the option to apply rate-based ACLs to these species. ECS would not be required to have an ACL or AM.
Would specific stock MSY and OY be required?	Yes, for all current MUS.	Yes, for all MUS, including new inclusions to the American Samoa BMUS list. ECS would not be required to have MSY and OY specified.
Would specific stock status determination criteria be required? (MFMT; MSST?)	Yes, for all MUS where available information allow establishment of SDC. Where data are not sufficient, NMFS and the Council would continue to rely on other means of evaluating stock status (e.g., indicators).	Yes, for all MUS, including new inclusions to the American Samoa BMUS list. Further, this alternative would include the option to apply rate-based SDC to these species. These criteria would not be required for ECS.
Would fisheries description be required in the FEP?	Yes. Fisheries descriptions would be retained for all current MUS in the American Samoa FEP.	Yes, a slightly revised fishery description would be required for the American Samoa bottomfish fishery in the American Samoa FEP consistent with the contents of this EA.
Would there be EFH designations?	Yes. EFH designations would be retained for all current MUS in the American Samoa FEP.	Yes. EFH designations would be retained for current MUS not being reclassified to ECS in the American Samoa FEP. Those MUS reclassified to ECS would have their EFH designations removed. Additionally, EFH designations would be implemented for all newly listed MUS in the American Samoa FEP (i.e., those species reclassified from non-MUS to BMUS). EFH would not be designated for any ECS. See Section 3.2.4 and 4.2.4 for more information.
Are EFH consultations	Yes, EFH is currently designated for all BMUS in American	EFH would continue to be designated for all MUS and federal agencies would be

Topic	Alt. 1 - No Action	Alt. 2 - Proposed Action
required?	Samoa. Federal agencies must consult with NMFS if proposed actions are expected to adversely affect this EFH.	required to consult with NMFS if a proposed action is expected to adversely affect EFH. The EFH designations for species reclassified as ECS would no longer apply, but the consultation requirement continue to apply over the same area because the EFH footprint will remain the same.

### 2.3 Alternatives Considered, but Rejected from Further Analysis

A possible alternative considered by the Plan Team but rejected from further analysis and not presented to the Council was a species list inclusive of several species not present on the proposed BMUS list. The species *Aprion virescens*, *Variola louti*, and *Caranx lugubris* were considered for inclusion on the proposed BMUS list because these species span both shallow and deep water (i.e., territorial and federal waters, respectively). However, the Plan Team ultimately decided to focus on deep-water snappers with similar life history characteristics that are predominantly caught in federal waters as the basis for the revised BMUS list in the American Samoa FEP, whereas *A. virescens*, *V. louti*, and *C. lugubris* either span both shallow and deep waters or are considered to inhabit intermediate depths (see Section 2.1.2).

### **3 DESCRIPTION OF THE AFFECTED ENVIRONMENT**

This section describes the baseline condition of affected fishery and fishery, biological, and physical resources in the action area. The affected environment includes all waters and associated demersal marine resources within the federal waters of American Samoa as managed under the FEP. This section also describes the socioeconomic and management setting, as well resources eliminated from detailed analysis. NMFS and the Council derive information regarding recent descriptions of resources, performance of the bottomfish fishery in American Samoa, information on protected species interactions in the fishery, indications of climate change and related oceanic conditions, description of EFH, and additional contextual information from the annual SAFE report for the American Samoa Archipelago (WPFMC 2023), the American Samoa FEP (WPFMC 2009), and other available information sources as cited below.

#### **3.1 Affected Physical Environment**

The affected physical environment would be the action area for the proposed action, inclusive of all waters from the shoreline to the extent of the EEZ around American Samoa where the bottomfish fishery is operating in both territorial and federal waters. The Territory of American Samoa consists of five volcanic islands (i.e., Tutuila, Aunu'u, Ofu, Olosega, and Ta'ū) with steep, mountainous terrain and high sea cliffs in addition to two coral atolls (i.e., Swains Island and Rose Atoll). The population in 2020 was 49,710 people, a vast majority of whom reside on Tutuila. Tutuila, the largest island in the archipelago, is characterized by an extensive shelf area accompanied by offshore banks and barrier reefs. Tutuila is also the center of government and business for the territory, and Pago Pago Harbor on Tutuila is one of the most sheltered natural deep water harbors in the Southern Pacific (WPFMC 2009).

Physical features of the affected environment in the action area include a range of habitats such as sandy coastal areas, coral reefs, seagrass beds, lagoons, open ocean waters, and the features of those habitats such as water circulation, temperature, salinity. For more information on the physical setting of the fisheries, please see the American Samoa FEP (WPFMC 2009).

#### **3.2 Affected Biological Resources**

##### **3.2.1 Affected Target Species and Non-Target Species**

The bottomfish fishery in American Samoa primarily targets and harvests a complex of 11 species comprised of snappers and groupers (Table 7 - see alt. 2). BMUS have been typically monitored at the complex level in both territorial and Federal waters, and the 2019 stock assessment (Langseth et al. 2019) and PIFSC SAP provided stock status and biomass projections at this level. Recently, the 2023 stock assessment (Nadon et al. 2023) separated the complex to the species level where available. As such, few species statuses still remain unknown in the MUS and will be monitored through the use of indicator species. Ultimately, NMFS only has regulatory control over Federal waters, and any action taken in territorial waters in accordance with this Federal action would be due to the territory deciding to implement complementary management with this Federal action.

The primary sources of information on target and non-target species associated with American Samoa bottomfish are NMFS stock assessments by Brodziak et al. (2012), Yau et al. (2016), Langseth et al. (2019), and Nadon et al. (2023), data provided by PIFSC SAP, as well as data provided by NMFS and summarized in the Council’s annual SAFE report (e.g., WPRFMC 2021). The 2023 stock assessment concluded that the stocks within American Samoa BMUS is neither overfished nor experiencing overfishing. However, few data limited species are listed as unknown. Of the commonly caught non-target species described in the above references, none are currently overfished or at risk of overfishing. Many of these species include the bottomfish that were part of the complex prior to this action.

### **3.2.2 Bycatch and Biodiversity**

The latest status information of the bycatch and biodiversity that may be affected by fisheries can be found in the annual SAFE reports (WPFMC 2020, WPFMC 2022, WPFMC 2023). In summary, the MSA § 303(a)(11) requires that all fishery management plans establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery. Additionally, MSA requires conservation and management measures that, to the extent practicable, minimize bycatch and bycatch mortality. The MSA § 303(a)(11) standardized reporting methodology is commonly referred to as a “Standardized Bycatch Reporting Methodology” (SBRM) and was added to the MSA by the Sustainable Fisheries Act of 1996. The Council implemented omnibus amendments to FMPs in 2003 to address MSA bycatch provisions and established SBRMs at that time. These descriptions are updated and further refined yearly through the development of the annual SAFE reports.

Raw bycatch information for the bottomfish fisheries is presented in the annual SAFE report for American Samoa (Table 8; WPFMC 2022). In American Samoa, BMUS bycatch stemming from boat-based fisheries is low to non-existent. The bycatch estimates are self-reported by fishers during creel survey interviews, and thus, the data are likely biased downward. The number caught is the sum of the total number of individuals found in the raw data including bycatch. The number discarded or released is the number of individuals designated as bycatch. Percent bycatch is the sum of all released divided by the number caught. Information on the species released is not available in the 2021 annual SAFE reports.

In American Samoa, bycatch data are available from 1992 through 2021 (Table 9). There has been no recorded BMUS bycatch over the course of the time series, and only one recorded instance of non-BMUS bycatch occurred in the American Samoa insular boat-based fishery in 2003. Thus, bycatch is almost non-existent in the fishery, and there are no documented instances of BMUS releases or discards in the past 30 years.

**Table 10: American Samoa bycatch data 1992-2021**

Year	BMUS			Non-BMUS			BMUS + Non-BMUS		
	# Caught	# Discard or Release	% Bycatch	# Caught	# Discard or Release	% Bycatch	# Caught	# Discard or Release	% Bycatch
1992	1,803	0	0	637	0	0	2,440	0	0
1993	1,534	0	0	860	0	0	2,394	0	0
1994	5,447	0	0	2,210	0	0	7,657	0	0
1995	2,397	0	0	1,008	0	0	3,405	0	0
1996	3,940	0	0	2,059	0	0	5,999	0	0
1997	2,910	0	0	2,283	0	0	5,193	0	0
1998	998	0	0	846	0	0	1,844	0	0
1999	3,213	0	0	2,417	0	0	5,630	0	0
2000	3,386	0	0	3,052	0	0	6,438	0	0
2001	3,499	0	0	2,703	0	0	6,202	0	0
2002	3,362	0	0	3,597	0	0	6,959	0	0
2003	3,778	0	0	4,019	1	0.0249	7,797	1	0.0128
2004	2,970	0	0	3,764	0	0	6,734	0	0
2005	1,807	0	0	1,877	0	0	3,684	0	0
2006	1,573	0	0	4,260	0	0	5,833	0	0
2007	2,752	0	0	4,184	0	0	6,936	0	0
2008	4,616	0	0	3,972	0	0	8,588	0	0
2009	11,080	0	0	8,441	0	0	19,521	0	0
2010	2,902	0	0	2,119	0	0	5,021	0	0
2011	4,229	0	0	3,130	0	0	7,359	0	0
2012	775	0	0	4,362	0	0	5,137	0	0
2013	1,031	0	0	3,494	0	0	4,525	0	0
2014	3,123	0	0	3,504	0	0	6,627	0	0
2015	3,602	0	0	3,666	0	0	7,268	0	0
2016	888	0	0	1,234	0	0	2,122	0	0
2017	926	0	0	1,425	0	0	2,351	0	0
2018	630	0	0	742	0	0	1,372	0	0
2019	771	0	0	823	0	0	1,594	0	0
2020	404	0	0	632	0	0	1,036	0	0
2021	124	0	0	108	0	0	232	0	0
10-yr avg.	1,227	0	0	1,999	0	0	3,226	0	0
10-yr SD	1,102	0	0	1,489	0	0	2,347	0	0
20-yr avg.	2,567	0	0	2,968	0	0.0012	5,535	0	0.0006
20-yr SD	2,382	0	0	1,868	0	0.0054	4,068	0	0.0028

There have been no EFH reviews completed by the Council in recent years. The non-fishing and cumulative impact components of EFH were reviewed in 2016 through 2017 for the region, which can be found in Minton (2017).

### **3.2.3 Protected Species**

The latest status information on protected species that may be affected by fisheries can be found in the 2022 Biological Opinion and annual SAFE reports (WPFMC 2020, WPFMC 2022, WPFMC 2023). Interactions with oceanic white tip sharks have been reported before; however, interactions with protected species (including oceanic white tip sharks) in the American Samoa bottomfish fishery are rare and not likely to occur.

### **3.2.4 Essential Fish Habitat and Habitat Areas of Particular Concern**

Consistent with the Magnuson-Stevens Act, and other applicable laws, NMFS and the Council designated EFH at the time it became a requirement. The Council also designated habitat areas of particular concern (HAPC) for some MUS. The reclassification of certain MUS to ECS under the proposed action would result in a change to EFH and HAPC descriptions in the FEPs and would eliminate EFH requirements for the ECS species listed in [Appendix A](#). Species that remain MUS and that are added as MUS through this action would still be subject to all EFH requirements. (Note: ecological relationships among species and between species and their habitat may include an ecosystem approach in determining EFH of an MUS).

#### *Overview of the EFH requirement under Magnuson-Stevens Act and the Council's application of the requirements*

In 1996, Congress amended the Magnuson-Stevens Act and required the identification and description of EFH for all federally managed species. EFH is defined in the Magnuson-Stevens Act as “those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity.” In 1999, NMFS issued guidelines to assist RMFCs in implementing the EFH provisions. The WPFMC developed the EFH designations and the Secretary of Commerce approved the Bottomfish and Seamount Groundfish EFH designations on February 3, 1999 (64 FR 19068). The FEP identifies the distribution and life history information on which EFH designations are based (see [Appendix 1](#) of the FEPs), as well as research and information needs by MUS. EFH designations must be based on the best scientific information available. This information should include a hierarchy of data of increasing quality for supporting EFH designations: (1) distribution, (2) densities, (3) demographics, (4) productivity (67 FR 2343, January 17, 2002). The best scientific information available that the Council inventoried in its initial EFH designations effort rarely exceeded level 1 (distribution).

While the descriptions of habitat requirements were generally species-specific, the Council ultimately designated EFH at a species complex level to reduce the complexity and number of EFH designations (64 FR 19068, 69 FR 8336, 73 FR 70603). EFH is generally designated for the egg/larval and juvenile/adult life stages combined, resulting in two unique EFH definitions per species complex.



EFH for bottomfish was originally designated in Amendment 6 to the Bottomfish and Seamount Groundfish FMP (64 FR 19067, April 19, 1999), and the levels of EFH information available for American Samoa BMUS are shown in Table 33 of the American Samoa Annual SAFE Report. To analyze the potential effects of a proposed fishery management action on EFH, one must consider all designated EFH, but research examining depth and habitat requirements for most species is generally lacking (PIFSC 2021). The levels of information available for American Samoa BMUS did not change in 2021.

**Table 33. Level of EFH information available for American Samoa BMUS**

<b>Life History Stage</b>	<b>Eggs</b>	<b>Larvae</b>	<b>Juvenile</b>	<b>Adult</b>
<i>Aphareus rutilans</i> (red snapper/silvermouth)	0	0	0	1
<i>Aprion virescens</i> (gray snapper/jobfish)	0	0	1	1
<i>Caranx lugubris</i> (black trevally/jack)	0	0	0	1
<i>Etelis carbunculus</i> (red snapper)	0	0	1	1
<i>E. coruscans</i> (red snapper)	0	0	1	1
<i>Lethrinus rubrioperculatus</i> (redgill emperor)	0	0	0	1
<i>Lutjanus kasmira</i> (blueline snapper)	0	0	1	1
<i>Pristipomoides filamentosus</i> (pink snapper)	0	0	1	1
<i>P. flavipinnis</i> (yelloweye snapper)	0	0	0	1
<i>P. zonatus</i> (snapper)	0	0	0	1
<i>Variola louti</i> (lunartail grouper)	0	0	0	1

Under the proposed action, EFH is considered a MSA component being fully described in the range of alternatives. Outside of the status quo alternative (Alternative 1), Alternative 2 fully describes the available EFH information by life stage for the species currently listed as MUS and for those species being added to the MUS. These EFH descriptions are detailed above in Table #.

### **Current EFH Designations for Territorial Bottomfish**

The Council has used the best scientific information available (BSIA) to describe EFH and provide information on the biological requirements for each life stage (i.e., egg, larvae, juvenile, and adult) for all MUS in American Samoa (see Table 11).

To reduce the complexity and the number of EFH identifications required for individual species and life stages, the Council has designated EFH for bottomfish assemblages pursuant to 50 CFR 600.805(b). The species complex designations include deep-slope bottomfish (i.e., shallow-water and deepwater) and are based on the ecological relationships among species and their preferred habitat. These species complexes are grouped by the known depth distributions of individual BMUS throughout the Western Pacific Region.

At present, there is not enough data on the relative productivity of different habitats to develop EFH designations based on Level 3 or Level 4 data. Given the uncertainty concerning the life histories and habitat requirements of many BMUS, the Council designated EFH for adult and juvenile bottomfish as the water column and all bottom habitat extending from the shoreline to a depth of 400 meters (200 fathoms) encompassing the steep drop-offs and high-relief habitats that

are important for bottomfish throughout the Western Pacific Region. This precautionary approach ensures that enough habitats are protected to sustain managed species.

**Table 11: EFH and HAPC for American Samoa BMUS**

(Source: WPFMC 2009)

American Samoa BMUS	EFH	HAPC
<i>Aphareus rutilans</i> (red snapper/silvermouth) <i>Aprion virescens</i> (gray snapper/jobfish) <i>Caranx lugubris</i> (black trevally/jack) <i>Etelis carbunculus</i> (red snapper) <i>E. coruscans</i> (red snapper) <i>Lethrinus rubrioperculatus</i> (redgill emperor) <i>Lutjanus kasmira</i> (blueline snapper) <i>Pristipomoides filamentosus</i> (pink snapper) <i>P. flavipinnis</i> (yelloweye snapper) <i>P. zonatus</i> (snapper) <i>Variola louti</i> (lunartail grouper)	<p><b>Eggs and larvae:</b> the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm).</p> <p><b>Juvenile/adults:</b> the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)</p>	<p>All slopes and escarpments between 40–280 m (20–140 fm)</p>

#### *Habitat Areas of Particular Concern*

The Council also identified HAPC for bottomfish, pelagic, crustacean, and precious coral MUS on February 3, 1999 (64 FR 19068); and the Coral Reef Ecosystem MUS on June 14, 2002 (69 FR 8336). HAPCs are subsets of EFH that meet one or more of the following criteria established by NMFS: (1) the ecological function provided by the habitat is important; (2) the habitat is sensitive to human-induced environmental degradation; (3) development activities are, or will be, stressing the habitat type; or (4) the habitat type is rare. The purpose of identifying HAPCs is to focus conservation efforts on localized areas within EFH that are vulnerable to degradation or are especially important ecologically for managed fish. Areas designated as HAPCs may receive increased scrutiny from NMFS regarding effects to EFH (NMFS 2006). Table 12 identifies HAPCs for the American Samoa FEPs.

#### **3.2.5 Marine Protected Areas**

The American Samoa bottomfish fishery operates near several marine protected areas (MPAs), including the Rose Atoll Marine National Monument, the National Marine Sanctuary of American Samoa in the Fagatele Bay unit, and the research zone of the Aunu'u Island units; bottomfish fishing is federally prohibited in each of these MPAs. Additionally, the fishery is not

allowed to operate in territorial MPAs where and/or when fishing is prohibited, such as in the no-take Fagamalo Village MPA.

### **3.3 Socio-economic Setting**

Under the Magnuson-Stevens Act, socio-economic considerations of proposed FEP amendments and fishery management actions should consider effects on fishing communities, other resource or area users, markets, earnings, disproportionately high and adverse health or environmental effects on members of minority or low-income populations, and health and safety.

Each of the islands in American Samoa are considered fishing communities and fishery participants include commercial, non-commercial and recreational (e.g., visitors) fishers. There is no subsistence fishing in the EEZ. Subsistence fishing, gathering of seaweeds, opihi, and other marine species occurs only in territorial and state waters. For more information on the socio-economic background of the fisheries, please see the FEPs (WPFMC 2009).

The proposed action is primarily administrative in nature and will likely have a negligible impact to the fishing communities. Impacts to the fishing communities as a result of this action are further described in section 4.2.3.

#### **Socioeconomics**

##### *Background*

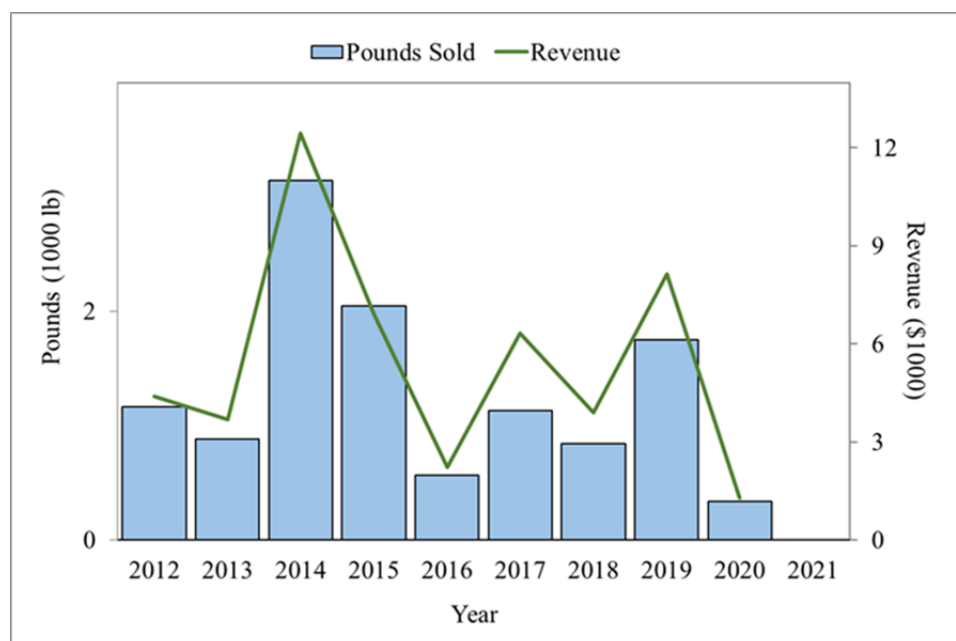
Fishing has played a crucial role in American Samoan culture and society since the Samoan archipelago was settled. The FEP for the American Samoa Archipelago (WPFMC 2009a) and the annual SAFE report (WPFMC 2022) describe the importance of marine resources in cultural, economic, and subsistence aspects of American Samoan village life, as well as a brief history of fishery development. Fishing was held in high regard in traditional Samoan culture, with fishing skill bringing high social status and fishing activities figuring prominently in mythology. The basic components of Samoan social structure are the family and village, with the family acting as the central unit. The village leadership decides, according to season, what sort of community fishing should take place. The *tautai*, or master fishermen, of the village were key decision makers who were awarded higher status than others who might otherwise outrank him when it came to matters of fishing. Village-level systems of governance and resource tenure are still largely intact, and American Samoan cultural systems and representation are formally incorporated into the Territorial Government. Reciprocity is emphasized over individual accumulation. Gifts of food, especially fish and other marine resources, mark every occasion and are a pivotal part of American Samoan social structure to this day. Contemporary American Samoan culture is characterized by a combination of traditional Samoan values and systems of social organization with a strong influence from Christianity. Maintaining *fa'a samoa*, or “the Samoan way”, was considered a priority under the Territorial constitution.

Over the last half century, fishing has become less prominent as a central and organized community force. During this time, modern fishing gears and technologies were introduced, tuna canneries became a major economic force in Pago Pago, the population more than tripled, and the gradual but continuous introduction of Western cultural norms and practices altered

American Samoans' relationship with the sea. The introduction of outboard engines and other technology in the 1950s and 1960s allowed American Samoan boats to go farther and faster, but also made it necessary for boat owners and operators to sell a portion of their catch to pay for fuel and engine maintenance. The disruption of other traditional values, as well as the introduction of a cash economy based primarily on government jobs and cannery employment, also decreased reliance on traditional, subsistence fishing; this allowed commercial fishing to develop on the islands (Levine and Allen 2009). While many traditions and village-based systems of governance have been maintained, the islands have experienced a shift from a subsistence-oriented economy, where sharing of fish catch was extremely important, to a cash-based economy, where fishing is often viewed as a more commercial venture.

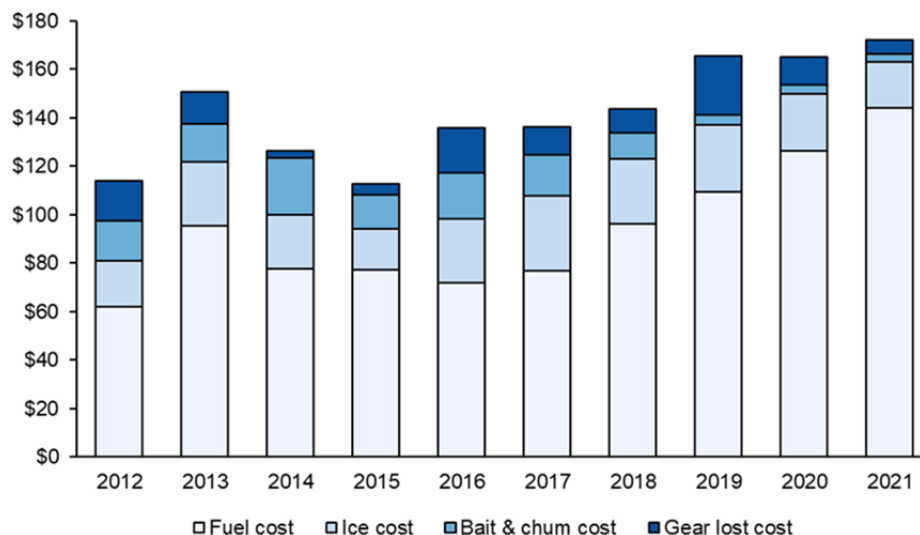
### *Fishery Economic Performance*

Figure 6 presents the trends of commercial pounds sold and revenue for BMUS harvested in the American Samoa bottomfish fishery from 2012 to 2021. Commercial landings data in 2021 are confidential due to fewer than three vendors and/or dealers reporting, though the total pounds sold and revenue for bottomfish were below the 10-year average (WPFMC 2022).



**Figure 6: Pounds sold and revenue for the American Samoa bottomfish fishery from 2012-2021**

Since 2009, PIFSC economists have maintained a continuous economic data collection program in American Samoa through collaboration with the PIFSC Western Pacific Fisheries Information Network (WPacFIN) that gathers fishing expenditure data for boat-based reef fish, bottomfish, and pelagic fishing trips on an ongoing basis. Data for fishing trip expenses include gallons of fuel used, price per gallon of fuel, cost of ice used, cost of bait and chum used, cost of fishing gear lost, and the engine type of the boat. Figure 9 shows the average trip costs for American Samoa bottomfish trips from 2012 to 2021. In 2021, the average trip cost of bottomfish trips was \$172, which is higher than 2020 due to increases in fuel price.



**Figure 7: Average Cost for American Samoa bottomfish trips from 2012-2021**

### Fisher Observations and COVID Impacts

In recent iterations of the Council’s annual SAFE reports, new information has been included associated with both perceptions of and impacts on these territorial fishing communities. Fishers Observations sections, which provide empirical, “on-the-water” information contributed by fishers, were added to each of the annual SAFE reports (WPFMC 2022). The initiative to collect fisher observations represents a collaborative effort by the Council and NMFS to better understand changes in the fishery over time based on the perception of fishery participants, and the observations can be used to help verify the fishery-dependent data collected through creel surveys and commercial purchase programs (and vice versa). As a special section to the annual SAFE reports in 2020 and 2021, an evaluation of the impacts of the COVID-19 pandemic on each of the Western Pacific territories was incorporated. Fishing communities and island economies across the Pacific Islands experienced pandemic-related impacts across this time period, and this content presents information that may provide context for observed fishery shifts over the same time. While the sections in the annual SAFE reports regarding COVID impacts will not persist into the future as pandemic-related impacts subside, it is anticipated that the Council and NMFS will continue to invest in and contribute to the collection of fisher observation information.

### 3.4 Management Setting

The proposed action to reclassify some MUS as ECS and add new MUS would affect the scope of stocks for the setting of ACLs and may affect some EFH consultations in the future. The management background for these practices are described below.

#### *ACLs*

Federal regulations at 50 CFR 665.4 (76 FR 37285, June 27, 2011) require NMFS to specify ACLs and AMs for each stock or stock complex of MUS identified in an FEP, as recommended by the Council, and in consideration of the best available scientific, commercial, and other information about the fishery for that stock or stock complex. NMFS currently specifies ACLs and AMs for stocks and species in the FEPs covering fisheries in American Samoa. NMFS analyzes the effects of the alternatives to setting ACLs, most recently in the EAs for the American Samoa BMUS rebuilding plan. The FEP and the annual SAFE report for American Samoa provide more detail on the ACL specification process (WPFMC 2009 and WPFMC 2023).

#### *EFH consultations and other habitat-related requirements*

Under the 1996 amendments to the Magnuson-Stevens Act, NMFS and FMCs are required to identify EFH for MUS in their fishery management plans. The Council's EFH designations are important because of the procedural requirements they impose on both Councils and federal agencies. First, for each MUS, Councils must identify EFH and minimize adverse impacts from federally authorized fishing activities on EFH. Second, the Magnuson-Stevens Act mandates that federal agencies conduct an EFH consultation with NMFS for "any action authorized, funded, or undertaken by a federal agency, or proposed to be authorized, funded, or undertaken by a federal agency" that may adversely affect EFH. This includes any project requiring a federal permit (e.g., from the US Army Corps of Engineers and Environmental Protection Agency), federal activities (e.g., Department of Defense (DOD) military activities and National Oceanic and Atmospheric Administration (NOAA) management actions), and federally-funded activities implemented by a federal agency or a federal designee. In American Samoa, these actions include aquaculture; installation of buoys, moorings, aids to navigation; cables and utilities; coastal hardening such as seawalls and revetments; infrastructure construction and development (e.g., resorts, housing, and critical infrastructure); dredging; drilling and/or geotechnical boring; harbor construction and repair; fish pond restoration; flood mitigation and erosion control; outfall pipes and repairs; transportation projects (highway, bridge, rail); and wave energy projects. Examples of federal agencies that most frequently consult with PIRO include the DOC, the US Army Corps of Engineers, and the Department of Transportation.

Under the Magnuson-Stevens Act, an adverse effect means "any impact that reduces the quality and/or quantity of EFH." Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate; and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. Adverse effects to EFH may result from actions occurring within EFH or "upstream" from EFH; and may include site-specific or habitat-wide impacts including individual, cumulative, or synergistic consequences of actions. Through EFH consultation, NMFS must provide conservation recommendations to the federal action agency (Magnuson-Stevens Act, 16 U.S.C. 1855 Section 305(b)(2) and 305(b)(4)) which may help the agency avoid, minimize, mitigate or otherwise offset for any "adverse effects" to EFH to the extent practicable for all MUS. The agency must respond to the recommendations in writing; if a response is inconsistent with NMFS conservation recommendations, the federal agency must explain its reasoning for not following the recommendation, including scientific justification (see 600.920(k)). If the interagency disagreement persists, the action may be elevated to the NMFS assistant administrator for further resolution with the action agency. For

more information on EFH and consultation requirements, see the American Samoa FEP (WPFMC 2009) and EFH consultation information and guidance provided at [http://www.fpir.noaa.gov/HCD/hcd\\_efh.html](http://www.fpir.noaa.gov/HCD/hcd_efh.html).

There are primarily three other types of federal regulatory functions that occur in areas currently designated as EFH and would continue to apply without EFH designation: consultations under the ESA and the Fish and Wildlife Coordination Act, and permitting under the Clean Water Act and/or the Rivers and Harbors Act. There are six habitat-forming coral species listed as threatened in American Samoa. When a federal action occurs that is likely to adversely affect these corals, the federal action agency must consult with NMFS under Section 7 of the ESA. Consultation under the Fish and Wildlife Coordination Act is intended to protect fish and wildlife when federal actions result in the control or modification of a natural stream or body of water, and impacts to fish and wildlife from proposed water resource development projects are evaluated and recommendations are provided. Permits are issued by the Department of the Army under Sections 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for projects involving dredge and/or fill (Section 404) and for the placement of structures that modify navigable waters (Section 10).

Under Section 404 of the CWA, compensatory mitigation is required for federally authorized impacts to aquatic resources, including special aquatic sites such as coral reefs and vegetated shallows or seagrass beds. Compensatory mitigation is meant to replace the ecosystem function of the affected resources for the purposes of offsetting unavoidable adverse impacts which remain after practicable avoidance and minimization has been achieved (73 FR 19687, April 10, 2008). National Pollutant Discharge Elimination System (NPDES) permits are issued by the EPA or delegated state agency for discharges into US waters. NPDES permits place monitoring requirements and limits, including turbidity, on facilities that discharge water to the environment to control point source pollution.

Federal agencies are also required to evaluate the potential environmental effects of their activities on the marine environment under the NEPA. Finally, Executive Order 13089 requires federal agencies to identify their actions that may affect US coral reef ecosystems, use their programs to protect and enhance the conditions of such ecosystems, and ensure that their actions will not degrade the conditions of such ecosystems to the extent permitted by law.

### **3.5 Resources Eliminated from Detailed Study**

To be included in later drafts.

## **4 POTENTIAL EFFECTS OF THE ALTERNATIVES**

This section describes the potential effects of each alternative on the components of the affected environment identified in Section 3 above.

The proposed action to designate some BMUS as ECS and some non-MUS as BMUS is inherently administrative in nature and is not likely to directly impact the following topics considered in this EA: Marine protected areas; vulnerable marine or coastal ecosystems; scientific, historic, archaeological, or cultural resources; biodiversity and ecosystem function;

highly uncertain effects unique or unknown risks; environmental justice; fishery operations; public health and safety at sea; potential for controversy; and climate change. Information regarding these topics and how they interact with the American Samoa bottomfish fishery are further detailed in the American Samoa FEP and annual SAFE report (WPFMC 2009 and WPFMC 2023).

The topics that are anticipated to experience some level of impact are further described within each alternative, as they relate to the MSA components: SDC; ACL/AMS and 50 CFR 600.310(h)(2); EFH; Monitoring and Bycatch; and Fishing Communities.

#### **4.1 Alternative 1 (No Action - Status Quo)**

Under the No Action Alternative, the Council and NMFS would not recommend or implement changes to the existing BMUS list in the American Samoa FEP. Management of the BMUS would continue to include annual specifications of ACLs and AMs, including for those species comprising the list that are not predominantly caught in federal waters and are not overfished or subject to overfishing.

##### **4.1.1 Potential Effects of Alternative 1 (No Action - Status Quo) on Target and Non-Target Species**

Alternative 1 maintains the current BMUS in American Samoa and therefore is likely to result in impacts to target and non-target species that are similar to what the fishery has been experiencing in recent years. Regarding the current MUS, SDC, and ACL/AMs in the American Samoa FEP consistent with regulations at 50 CFR 600.310(h)(2), impacts to target and non-target species are anticipated to range from slight negative to no impact, when compared to current fishery operations because the MUS list would remain as it is currently and no other changes would be made, and thus the fishery would continue normal operations. However, retaining the current MUS could lead to BMUS management issues down the road associated with managing shallow water species predominantly caught in territorial waters. For SDC and ACL/AMs in the American Samoa FEP consistent with regulations at 50 CFR 600.310(h)(2), status quo operations are likely not adequate for the data limited fishery. For EFH, there is no anticipated impact to target and non-target species given EFH is already defined for the current MUS to the extent practicable. For monitoring and bycatch, the current monitoring system is inadequate and led to a data limited BMUS stock complex. This monitoring would remain in place for the current BMUS and its deficiencies would continue to impose slight negative impacts on the assessment and management of American Samoa bottomfish. For the fishing communities, there is no anticipated impact to target and non-target species compared to baseline fishery operations given the administrative nature of this action and that Alternative 1 does not implement changes from the way the fishery is currently operating.

##### **4.1.2 Potential Effects of Alternative 1 (No Action - Status Quo) on Bycatch**

Under Alternative 1, the American Samoa BMUS list would not change and would continue to have limited interactions with bycatch given the fishery remains highly target-specific. Additionally, the administrative nature of this action and minimal interactions with bycatch through this fishery is likely to result in no impact to any of the MSA components.



#### **4.1.3 Potential Effects of Alternative 1 (No Action - Status Quo) on Protected Species**

Under Alternative 1, the American Samoa BMUS list would not change and would continue to have limited interactions with ESA or MMPA-listed species. Protected species that may interact with the fisheries include sea turtles, listed marine mammals, listed sharks, listed corals, listed seabirds; however, these interactions rarely occur. The latest status information of the protected species that may be affected by fisheries can be found in the annual SAFE reports (WPFMC 2009 and WPFMC 2023). Ultimately, there is no anticipated impact to protected species given the administrative nature of this action and that interactions are already rare.

NMFS monitors the effects of the fishery on non-ESA listed marine mammals through comparison of the average level of interactions which result in M&SI to a stock's potential biological removal (PBR). For most marine mammal stocks where the PBR is available, the number of observed takes of marine mammal species in the bottomfish fishery inside the U.S. EEZ around American Samoa is well below the PBR in the time period covered by the most current stock assessment report.

#### **4.1.4 Potential Effects of Alternative 1 (No Action - Status Quo) on the Physical Environment and Essential Fish Habitat**

Under Alternative 1, the American Samoa BMUS list would not change and would continue to have limited interactions with the physical environment and EFH. The latest descriptions of the physical environment and EFH, including HAPCs, that may be affected by the fisheries can be found in the annual SAFE reports (WPFMC 2009 and WPFMC 2023). Moreover, there is no anticipated impact given the administrative nature of this action and that the current EFH designations will not change.

#### **4.1.5 Potential Effects of Alternative 1 (No Action - Status Quo) on the Human Communities**

Under the MSA, socio-economic considerations of proposed FEP amendments and fishery management actions should consider effects on fishing communities, other resource or area users, markets, earnings, disproportionately high and adverse health or environmental effects on members of minority or low-income populations, and health and safety.

Each of the islands in American Samoa are considered fishing communities and fishery participants include commercial, non-commercial and recreational (e.g., visitors). Given the fishing activities for all participants will remain the same as under the current management structure, no impact to the human communities is anticipated under Alternative 1.

#### **4.1.6 Potential Cumulative Effects of Alternative 1 (No Action - Status Quo)**

### **4.2 Alternative 2 (Preferred Alternative)**

Under Alternative 2, NMFS and the Council would amend the American Samoa FEP to revise the current BMUS list (see Table 1), reclassifying five of the former BMUS as ECS and seven non-MUS (i.e., a mix of ECS and species currently not listed in the FEP) as new MUS.

Alternative 2 would expand the current list of 11 BMUS to a new BMUS list of 13 species. The species reclassified as ECS would be identified as not in need of conservation and management based on the NS1 Guidelines. Similarly, those species added to the BMUS list would be identified as being predominantly harvested in federal waters and in need of conservation and management. The Council recommended the proposed reclassifications in consideration of the hierarchical cluster analysis (Ahrens et al. 2022) and Plan Team deliberations, which included utilizing the ten factors described in 50 CFR 600.305(c)(1) of the NS1 guidelines discussed in Section 2.1.2. Table 3 provides the proposed BMUS list in the American Samoa FEP under Alternative 2.

#### **4.2.1 Potential Effects of Alternative 1 (No Action - Status Quo) on Bycatch**

#### **4.2.2 Potential Effects of Alternative 1 (No Action - Status Quo) on Protected Species**

#### **4.2.3 Potential Effects of Alternative 1 (No Action - Status Quo) on the Physical Environment and Essential Fish Habitat**

#### **4.2.4 Potential Effects of Alternative 1 (No Action - Status Quo) on the Human Communities**

#### **4.2.5 Potential Cumulative Effects of Alternative 1 (No Action - Status Quo)**

### **5 SUMMARY OF POTENTIAL EFFECTS**

**Table 11. Summary of potential fishery and fishery management changes and potential effects of the alternatives on fisheries and other resources.**

	<b>Status Quo</b>	<b>Alternative 2</b>
<b>Brief Description of Alternative</b>	No MUS would be reclassified as ECS in any of the three Archipelagic FEPs (American Samoa, Mariana or Hawaii)	Reclassify some MUS as ECS and some would remain as MUS.
<b>Areas affected</b>	American Samoa, Mariana Islands (CNMI and Guam), and Hawaii	American Samoa, Mariana Islands (CNMI and Guam), and Hawaii
<b>Fishery Locations</b>	Federal fisheries occur in waters of the US EEZ in the state of Hawaii and territories of American Samoa and Guam, and the CNMI. State or territorial fisheries generally occur within 3nm from shore in these four areas.	No change.

	Status Quo	Alternative 2
<b>Highlights of relevant fishery management scheme</b>	<p>MUS are subject to ACLs and AMs.</p> <p>Regulations include requirements for permits, reports, gear markings, prohibitions on certain gear and authorizations.</p> <p>The Council (including NMFS and local fisheries agencies) monitors marine fisheries in the four areas on a regular basis.</p>	<p>MUS would continue to be subject to ACL specifications and AMs. The number of species or stocks that would be subject to ACLs and AMs would be reduced.</p> <p>Most of the existing regulatory management provisions and monitoring would continue to apply to both MUS and ECS to allow for monitoring of the ECS, as well as the ecosystem.</p>
<b>EFH</b>	<p>NMFS and the Council have designated EFH for all MUS. Table 5 lists the current EFH designations.</p> <p>HAPC is a subset of EFH and comprises areas of special importance to MUS. Table 6 describes HAPC.</p> <p>Federal agencies must consult with NMFS on the potential effects of proposed actions that may adversely affect EFH.</p>	<p>The proposed designation of ECS would not directly affect EFH because the designations would not change the way any fishery is being conducted including location, target and non-target species, catch, effort, fishermen participation, gear composition, seasonality, intensity, or bycatch.</p> <p>NMFS and the Council would continue to designate EFH for all MUS and periodically review EFH designations in accordance with the Magnuson-Stevens Act. Changes in geographic area for EFH and changes to HAPC are described in the EA in Section 4.2.2. In the future, the geographic extent of habitat designated as EFH could change, depending on future Council reviews. It would be speculative to try to anticipate what those changes would be. Federal agencies would conduct site- and project-specific environmental reviews.</p>
<b>Permits</b>	<p>Permits are required to fish for certain stocks or species or in certain areas.</p> <p>These include:</p> <p>MHI non-commercial bottomfish, special coral reef ecosystem fishing, western Pacific precious coral, western Pacific crustaceans, Guam large vessel bottomfish, CNMI bottomfish.</p>	<p>No change. Permits would be required for MUS species reclassified as ECS for monitoring purposes.</p>
<b>Current and expected fishery outcomes</b>	<p>The affected fisheries are nearshore and EEZ fisheries in all areas including: hand and spear for spiny and slipper lobsters and Kona crab; bottomfish fisheries in all areas</p>	<p>No change to any fishery including location, target and non-target species, catch, effort, fishermen participation, gear composition, seasonality, intensity, or bycatch.</p>

	<b>Status Quo</b>	<b>Alternative 2</b>
	including Deep 7 bottomfish fisheries in Hawaii; seamount groundfish fisheries; coral reef ecosystem fisheries (pole and line, spear fishing, and net fishing); and precious coral fisheries.	
<b>Effects on the Physical Environment</b>		
<b>Effects on physical parameters (e.g., water and air quality, currents, temperature, salinity, weather patterns)</b>	The physical environment is the oceanic and coastal setting of the four island areas and described in three Archipelagic FEPs.	No change. The proposed action would not change any fishery activity; therefore, this alternative does not have the potential to have effects on the physical environment including on water or air quality, currents, temperature, salinity, or weather patterns.
<b>Effects on the Biological Resources</b>		
<b>Target species, non-target species, bycatch, biodiversity, marine habitat from fishing activities, protected species, and MPAs</b>	<p>All stocks and species in the FEPs are MUS and, therefore, in need of conservation and management. Demersal species and stocks of bottomfish, seamount groundfish, coral reef species, precious corals, and crustaceans are managed under a range of measures described in the FEPs.</p> <p>Prior analyses developed for setting ACLs and AMs have determined there is no significant impact from these fisheries. Monitoring of fishing and its effects on biodiversity would continue through the Council and research programs.</p> <p>All federal fisheries are currently authorized in accordance with all applicable laws.</p> <p>NMFS has previously reviewed effects of fishing activities on MPAs.</p>	No change to the fisheries in any way that would affect catches of target or non-target species, bycatch, biodiversity, marine habitat from fishing activities, or protected species. Monitoring, review by the Council, and research would continue. No change in how fisheries would affect MPAs.
<b>Socio-Economic Effects</b>		
<b>Fishing communities; general participation in the fishery; environmental justice; cultural,</b>	The FEPs describe the socio-economic factors in American Samoa, Mariana Islands (CNMI and Guam), and Hawaii.	No change to the fisheries and no effect on socio-economic factors.

	Status Quo	Alternative 2
<b>historic, and archaeological resources; gross revenue at risk</b>		
<b>Management Setting Effects</b>		
<b>ACLs</b>	Annual specification of ACLs and AMs for species that do not have meaningful conservation and management value, and caught primarily in state or territorial waters.	The number of MUS would be reduced: in the American Samoa FEP from 205 species/families to 11 species; from 227 species/families to 13 species in the Marianas FEP; and from 173 species/families to 20 MUS species in the Hawaii FEP.
<b>EFH Consultation</b>	Federal agencies are required to consult with NMFS on project that would potentially effect EFH.	<p>Consultation on EFH for MUS would continue in designated areas for the MUS. The nature of the EFH consultation may change based on the habitat utilization of the MUS under Alternative 2.</p> <p>Agencies would no longer be required to consult on projects occurring in the outer reef slopes between 400 and 700 m in the American Samoa and Marianas FEPs management areas. Because the water column is designated as pelagic EFH to a depth of 1,000 m throughout the EEZ, activities occurring in this area would likely trigger a consultation for water column effects. We expect the total number of EFH consultations would remain stable.</p>
<b>Other Potential Effects</b>		
<b>Climate and Adaptation</b>	Changing climate has the potential to affect various fish species, habitats, and protected species through ocean warming; increased ocean acidification; changes in currents and nutrient cycles; and increased terrestrial inputs from stormwater runoff.	No change to fisheries, so there is no potential for cumulative effects on the environment when also considering potential changes to the marine setting. Climate changes would not affect the efficacy of the management improvements by designating some MUS as ECS.

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## APPENDIX A. MANAGEMENT UNIT SPECIES AND NATIONAL STANDARD 1 FACTORS

Appendix A provides the MUS for each area, and the NS1 factors that correspond to each. The Council recommended the MUS lists to NMFS based on the process described in Section 2.1, Development of the Alternatives.

### NS1 Factors

1. The stock is an important component of the marine environment.
2. The stock is caught by the fishery.
3. Whether an FMP can improve or maintain the condition of the stock.
4. The stock is a target of a fishery.
5. The stock is important to commercial, recreational, or subsistence users.
6. The fishery is important to the Nation or to the regional economy.
7. The need to resolve competing interests and conflicts among user groups and whether an FMP can further that resolution.
8. The economic condition of a fishery and whether an FMP can produce more efficient utilization.
9. The needs of a developing fishery, and whether an FMP can foster orderly growth.
10. The extent to which the fishery is already adequately managed by states, by state/federal programs, or by federal regulations pursuant to other FMPs or international commissions, or by industry self-regulation, consistent with the requirements of the Magnuson-Stevens Act and other applicable law.

### American Samoa MUS

#### Bottomfish

Scientific Name	Common Name	Samoan name	Family	NS1 Factors Met
<i>Caranx lugubris</i>	Black trevally, jack	tafauli	Carangidae	1,2,4,6,8,9,10
<i>Lethrinus rubrioperculatus</i>	Redgill emperor	filoa-paomumu	Lethrinidae	1,2,4,5,6,8,9,10
<i>Aphareus rutilans</i>	Red snapper, silvermouth	palu-gutusaliva	Lutjanidae	1,2,4,6,8,9,10
<i>Aprion virescens</i>	Grey snapper, jobfish	asoama		1,2,4,5,6,8,9,10
<i>Etelis carbunculus</i>	Red snapper	palu malau		1,2,4,6,8,9,10
<i>Etelis coruscans</i>	Red snapper	palu-loa		1,2,4,6,8,9,10
<i>Lutjanus kasmira</i>	Blueline snapper	savane		1,2,4,5,6,8,9,10
<i>Pristipomoides filamentosus</i>	Pink snapper	palu-`ena`ena		1,2,4,6,8,9,10
<i>Pristipomoides flavipinnis</i>	Yelloweye snapper	palu-sina		1,2,4,6,8,9,10
<i>Pristipomoides zonatus</i>	Snapper	palu-ula, palu-sega		1,2,4,6,8,9,10
<i>Variola louti</i>	Lunartail grouper	papa, velo	Serranidae	1,2,4,5,6,8,9,10

### Mariana Archipelago MUS

## Bottomfish

Scientific Name	Common Name	Local name Chamorro/Carolinian	Family	NS1 Factors Met
<i>Caranx ignobilis</i>	Giant trevally	tarakitu, etam	Carangidae	1,2,4,6,8,10
<i>Caranx lugubris</i>	Black trevally, jack	tarakiton attelong, orong		
<i>Lethrinus rubrioperculatus</i>	Redgill emperor	mafuti, atigh	Lethrinidae	1,2,4,5,6,8,10
<i>Aphareus rutilans</i>	Red snapper, silvermouth	lehi, maroobw	Lutjanidae	1,2,4,6,8,10
<i>Etelis carbunculus</i>	Red snapper	buninas agaga', falaghal moroobw		1,2,4,6,8,10
<i>Etelis coruscans</i>	Red snapper	abuninas, taighulupegh		1,2,4,6,8,10
<i>Lutjanus kasmira</i>	Blueline snapper	funai, saas		1,2,4,5,6,8,10
<i>Pristipomoides auricilla</i>	Yellowtail snapper	buninas, falaghal-marooobw		1,2,4,6,8,10
<i>Pristipomoides filamentosus</i>	Pink snapper	buninas, falaghal-marooobw		1,2,4,6,8,10
<i>Pristipomoides flavipinnis</i>	Yelloweye snapper	buninas, falaghal-marooobw		1,2,4,6,8,10
<i>Pristipomoides sieboldii</i>	Pink snapper	NA		1,2,4,6,8,10
<i>Pristipomoides zonatus</i>	Snapper	buninas rayao amariyu, falaghal-marooobw		1,2,4,6,8,10
<i>Variola louti</i>	Lunartail grouper	bueli, bwele	Serranidae	1,2,4,5,6,8,10

## Hawaii MUS

### Deep 7 Bottomfish

Scientific Name	Common Name	Local Hawaiian Name	Family	NS1 Factors Met
<i>Aphareus rutilans</i>	Silverjaw jobfish	lehi	Lutjanidae	1,2,3,4,5,6,8,10
<i>Etelis carbunculus</i>	Red snapper	ehu		1,2,3,4,5,6,8,10
<i>Etelis coruscans</i>	Longtail snapper	onaga or 'ula'ula koa'e		1,2,3,4,5,6,8,10
<i>Pristipomoides filamentosus</i>	Pink snapper	'opakapaka		1,2,3,4,5,6,8,10
<i>Pristipomoides sieboldii</i>	Pink snapper	kalekale		1,2,3,4,5,6,8,10
<i>Pristipomoides zonatus</i>	Snapper	gindai		1,2,3,4,5,6,8,10
<i>Hyporthodus quernus</i>	Sea bass	hapu'upu'u	Serranidae	1,2,3,4,5,6,8,10

### Non-Deep 7 Bottomfish

Scientific Name	Common Name	Local Hawaiian name	Family	NS1 Factors Met
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Scientific Name	Common Name	Local Hawaiian name	Family	NS1 Factors Met
<i>Aprion virescens</i>	Gray jobfish	uku	Lutjanidae	1,2,3,4,5,6,8,10

### Precious Corals

Scientific name	Common Name	Family	NS1 Factors Met
<i>Antipathes grandis</i>	Black coral	Antipatheria	1,2,3,4,5,6,8,10
<i>Antipathes griggi</i>	Black coral		1,2,3,4,5,6,8,10
<i>Myriopathes ulex</i>	Black coral		1,2,3,4,5,6,8,10
<i>Hemicorallium laauense</i>	Red coral	Corallidae	Existing regulations
<i>Pleurocorallium secundum</i>	Pink coral		Existing regulations
<i>Acanella</i> spp.	Bamboo coral	Isididae	Existing regulations
<i>Kulamanamana haumea</i>	Gold coral	Parazoanthidae	Existing regulations

### Crustaceans

Scientific name	Common name	Local Hawaiian name	Family name	NS1 Factors Met
<i>Heterocarpus</i> spp.	Deepwater shrimp	NA	Pandalidae	1,2,3,4,5,6,8,10
<i>Ranina ranina</i>	Kona crab	papa'i kua loa	Raninidae	1,2,3,4,5,6,8,10

### Seamount Groundfish

Scientific name	Common Name	Family	NS1 Factors Met
<i>Beryx splendens</i>	Alfonsin	Berycidae	Existing regulations
<i>Hyperoglyphe japonica</i>	Raftfish	Centrolophidae	Existing regulations
<i>Pentaceros wheeleri</i>	Armorhead	Pentacerotidae	Existing regulations

## Appendix X: PIFSC Hierarchical Cluster Analysis Results

### 1 Available EFH Information

**Table x. Relevant life history and habitat information for the various life stages of proposed revised American Samoa Archipelago BMUS.**

Species	Eggs/Larvae	Juvenile	Adult
<i>Aphareus rutilans</i>	<p><b>Eggs:</b> pelagic, spherical, and small (0.77–0.85 mm).</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands. Larvae remain planktonic to at least 54 mm</p> <p>(Leis 1987; Leis and Lee 1994; Leis and Carson-Ewart 2004)</p>	<p>A single juvenile was collected at 40 m off Kaneohe Bay, Oahu on a shallow sediment flat.</p> <p>(Parrish 1989)</p>	<p>Seamounts and continental slope habitats with a wide depth range (100–300 m) and no apparent bottom habitat preference. In the Mariana Archipelago, it was caught between 119–229 m during surveys.</p> <p>Aggregations of <i>A. rutilans</i> were found near areas of prominent relief features such as headlands, showing a preference for habitats with hard substrates.</p> <p>Gonochoristic broadcast spawners that form spawning aggregations that coincide with warmer water temperatures. A large school (&gt;100 individuals) was sighted on a bottom camera in Hawaii.</p> <p>(Allen 1985; Misa et al. 2008; Parrish 1989; Ralston and Williams 1988; Richards pers. comm. 2022)</p>
<i>Etelis boweni</i>	<p>Newly described cryptic species. Habitat is assumed to be similar to <i>E. carbunculus</i> due to co-occurrence in catch.</p>		

Species	Eggs/Larvae	Juvenile	Adult
<i>Etelis carbunculus</i>	<p><b>Eggs:</b> pelagic, spherical, and small (0.77–0.85 mm).</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands. Larvae remain planktonic at least to 50 mm.</p> <p>(Leis 1987; Leis and Lee 1994; Leis and Carson-Ewart 2004)</p>	<p>Juveniles settle directly in adult habitats (depth and habitat). Juvenile <i>E. carbunculus</i> &lt; 22 cm SL were caught during fishing surveys in depths between 183–313 m depth and 15 cm FL fish were observed during submersible dives off North Oahu and East Oahu at depths of 274–290 m and 300 m, respectively. Juveniles were observed very close to the bottom either solitary or in small groups. Cavities that provide shelter appear to be particularly important to this species.</p> <p>(Parrish 1989; Kelley et al. 1997; Kelley et al. 2006; Ikehara 2006; Weng 2013; WPFMC 2016)</p>	<p>Adults are found on the hard substrate deepwater slopes in areas of high structural complexity. They inhabit seamounts and continental slope habitats with greatest abundance between 200–310 m on hard bottom, low slope habitats and do not exhibit any ontogenetic habitat shifts.</p> <p>Individuals are found solitarily or in small groups. <i>E. carbunculus</i> were recorded during 90 BotCam drop camera deployments in the MHI at depths of 192–325 m and in temperatures ranging from 10.70 °C – 19.11 °C and averaging 14.58 °C. Individuals recorded as deep as 515 m from the <i>Pisces</i> submersible in Hawaii.</p> <p>Adults require shelter and therefore are rarely observed venturing up into the water column. There is currently no information to suggest that they travel great distances outside a small home range.</p> <p>(Allen 1985; Drazen, unpub. data; Everson 1984; Haight 1989; Misa et al. 2013; Ralston and Polovina 1982; Weng 2013)</p>



Species	Eggs/Larvae	Juvenile	Adult
<i>Etelis coruscans</i>	<p><b>Eggs:</b> pelagic, spherical, and small (0.77–0.85 mm) and larvae hatch at about 1.7–2.2 mm.</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands until at least 22 mm. PLD is assumed to range between 40–180 days.</p> <p>(Leis 1987; Leis and Lee 1994; Leis and Carson-Ewart 2004)</p>	<p>Juveniles are thought to settle directly to adult habitats and were observed very close to the bottom or hiding in cavities.</p> <p>(Ikehara 2006)</p>	<p>Seamounts and continental slope habitats with the greatest abundance between 200–310 m on hard bottom habitats with larger fish occupying relatively higher slope habitats than smaller fish. Adults in Hawaii form benthopelagic schools up to tens of meters off the bottom. In the Mariana Archipelago, it was caught between 155–320 m.</p> <p>Gonochoristic broadcast spawners that form spawning aggregations that coincides with warmer water temperatures. There is currently no information to suggest that they travel great distances outside a small home range.</p> <p>(Allen 1985; Everson et al. 1989; Misa et al. 2013; Weng 2013)</p>
<i>Paracaesio kuskarii</i>	<p>There is no specific information for this species.</p> <p><b>Eggs:</b> All lutjanid eggs are pelagic, small (0.77–0.85 mm diameter) and spherical.</p> <p><b>Larvae:</b> Larvae of lutjanids hatch at about 1.7–2.2 mm, and have a large yolk sac.</p> <p>(Leis 1987; Leis and Carson-Ewart 2004)</p>	<p>There is no specific information for this species.</p>	<p>Occurs over rocky bottoms at depths of 100–310 m.</p> <p>(Allen 1985; Carpenter and Niem 2001)</p>

Species	Eggs/Larvae	Juvenile	Adult
<i>Paracaesio stonei</i>	<p>There is no specific information for this species.</p> <p><b>Eggs:</b> All lutjanid eggs are pelagic, small (0.77–0.85 mm diameter) and spherical.</p> <p><b>Larvae:</b> Larvae of lutjanids hatch at about 1.7–2.2 mm, and have a large yolk sac.</p> <p>(Leis 1987; Leis and Carson-Ewart 2004)</p>	<p>There is no specific information for this species.</p>	<p>Bathydemersal; depth range 200–320 m.</p> <p>(Allen 1985; Fry et al. 2006)</p>
<i>Pristipomoides argyrogrammicus</i>	<p>There is no specific information for this species.</p> <p><b>Eggs:</b> All lutjanid eggs are pelagic, small (0.77–0.85 mm diameter) and spherical.</p> <p><b>Larvae:</b> Larvae of lutjanids hatch at about 1.7–2.2 mm, and have a large yolk sac.</p> <p>(Leis 1987; Leis and Carson-Ewart 2004)</p>	<p>There is no specific information for this species.</p>	<p>Occurs over rocky bottoms at depths between about 70–300 m. In the Mariana Archipelago, it was caught between 183–293 m during surveys.</p> <p>(Allen 1985; Ralston and Williams 1988)</p>

Species	Eggs/Larvae	Juvenile	Adult
<i>Pristipomoides auricilla</i>	<p><b>Eggs:</b> pelagic, spherical, and small (0.77–0.85 mm).</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands. Larvae remain planktonic to at least 54 mm.</p> <p>(Leis and Lee 1994; Leis and Carson-Ewart 2004)</p>	There is no specific information for this species.	<p>Seamounts and continental slope habitats and generally occur over rocky reefs and hard bottoms at depths between 90–360 m but are most abundant between 180–270 m. In the Mariana Archipelago, it is frequently caught between 90–270 m. They form small to medium-sized benthopelagic schools that swim relatively close to the bottom.</p> <p>Gonochoristic broadcast spawners that form spawning aggregations that coincides with warmer water temperatures.</p> <p>(Allen 1985; Ralston and Williams 1988)</p>

Species	Eggs/Larvae	Juvenile	Adult
<i>Pristipomoides filamentosus</i>	<p><b>Eggs:</b> pelagic, spherical, and small in size (0.77–0.85 mm).</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands. Larvae remain planktonic to at least 54 mm. A PLD of 60–180 days was suggested which is based on estimated ages of juveniles from other studies. Juveniles first appear in juvenile habitat at 70–100 mm FL.</p> <p>(Moffitt and Parrish 1996; Leis and Lee 1994; Leis and Carson-Ewart 2004).</p>	<p>Juveniles occupy nursery areas consisting of flat, featureless, sandy substrate in shallow water (30 m) for the first two years before moving into adult habitats.</p> <p>(Misa et al. 2013; Parish 1989; Parrish et al. 2015)</p>	<p>Seamounts and continental slope habitats. Adult greatest abundance is between 90–210 m on hard bottom, low slope habitats. In the Mariana Archipelago, it was caught between 110–229 m during surveys. They utilize mostly physical habitats that are abundant and not easily disturbed. Individuals are found in areas of high relief at depths of 100–400 m, and at night, they migrate into shallower flat, shelf areas, where they are found at depths of 30–80 m.</p> <p>Gonochoristic broadcast spawners that form spawning aggregations which coincides with warmer water temperatures.</p> <p>(Allen 1985; Misa et al. 2013; Moffitt and Parrish 1996; Parrish 1989; Parrish et al. 1997; Ralston and Williams 1988; Ziemann and Kelley 2004)</p>
<i>Pristipomoides flavipinnis</i>	<p><b>Eggs</b> are pelagic, spherical, and small (0.77–0.85 mm).</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands.</p> <p>(Leis and Carson-Ewart 2004)</p>	<p>There is no specific information for this species.</p>	<p>Generally occur over rocky reefs and hard bottoms at depths between 90–360 m but are most abundant between 180–270 m. In the Mariana Archipelago, it was caught between 123–274 m during surveys.</p> <p>Gonochoristic broadcast spawners that form spawning aggregations that coincides with warmer water temperatures.</p> <p>(Allen 1985; Ralston and Williams 1988)</p>

Species	Eggs/Larvae	Juvenile	Adult
<i>Pristipomoides multidentis</i>	<p>There is no specific information for this species.</p> <p><b>Eggs:</b> All lutjanid eggs are pelagic, small (0.77-0.85 mm diameter) and spherical. <b>Larvae:</b> Larvae of lutjanids hatch at about 1.7-2.2 mm, and have a large yolk sac. Individuals of <i>Pristipomoides</i> remain pelagic to considerable size.</p> <p>(Leis 1987; Leis and Lee 1994; Leis and Carson-Ewart 2004)</p>	<p>Juveniles were found in flat, featureless, sandy habitats in mixed schools with <i>Nemipterus</i> sp. in areas distinctly separate from the adult habitats.</p> <p>(Newman et al. 2016)</p>	<p>A schooling fish that inhabits hard bottom areas with vertical relief and large epibenthos. Depth ranges from 60 to at least 200 m and are concentrated in depths from 80–150 m.</p> <p>(Newman et al. 2000)</p>
<i>Pristipomoides sieboldii</i>	<p><b>Eggs:</b> pelagic, spherical, and small in size (0.77–0.85 mm).</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands. Larvae remain planktonic to at least 54 mm.</p> <p>(Leis and Lee 1994; Leis and Carson-Ewart 2004)</p>	<p>There is no specific information for this species.</p>	<p>Seamounts and continental slope habitats with the greatest abundance between 180–270 m but no affinity to a specific habitat; however, a habitat shift to hard bottom, high slope from other habitat types was observed within the size class of 25–35 cm. In the Mariana Archipelago, it was caught between 146–274 m during surveys. Often observed in large schools.</p> <p>Gonochoristic broadcast spawners that form spawning aggregations that coincides with warmer water temperatures.</p> <p>(Allen 1985; Misa et al. 2013; Ralston and Williams 1988)</p>

Species	Eggs/Larvae	Juvenile	Adult
<i>Pristipomoides zonatus</i>	<p><b>Eggs:</b> pelagic, spherical, and small in size (0.77–0.85 mm).</p> <p><b>Larvae:</b> pelagic and distributed off the edge of continental shelves and offshore from oceanic islands.</p> <p>(Leis and Carson-Ewart 2004)</p>	<p>Juveniles are thought to settle directly in adult habitats and were observed very close to the bottom either solitary or in small groups.</p> <p>(Kelley et al. 1997)</p>	<p>Seamounts and continental slope habitats with a preference for hard substrate and high slopes such as escarpments with high vertical relief.</p> <p>Preferred depth in Hawaii is 200–259 m and at Johnston Atoll 215–250 m. In the Mariana Archipelago, it was caught between 128–293 m during surveys.</p> <p>Gonochoristic broadcast spawners that form spawning aggregations that coincides with warmer water temperatures.</p> <p>(Allen 1985, Misa 2008, Ralston and Williams 1988)</p>