WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

Options for Reclassification of the Bottomfish Management Unit Species for the American Samoa and the Marianas Fishery Ecosystem Plans

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CHAPTER 1. Background Information

1.1 Existing Bottomfish Management Unit Species in the Fishery Ecosystem Plan

The original Fishery Management Plans (FMP) for bottomfish in American Samoa, Guam, and Hawaii (WPRFMC 1986) considered a complex of 60 species from four families: Lutjanidae (snappers), Serranidae (groupers), Carangidae (jacks), and Lethrinidae (emperors). The list was narrowed down to 20 species based on what fishers land most frequently. The fishery for these species is of high-value due to fresh fish market prices, consumer demand, and cultural importance in Pacific Island communities. In 2009, the Council developed five new archipelagic-based FEPs that incorporated and reorganized elements of the Councils' species-based FMPs into spatially-oriented management plans (75 FR 2198, January 14, 2010). This reduced the number of species to 16 species in the Marianas and 17 species in American Samoa.

In 2018, the Council took action to refine the bottomfish management unit species (BMUS) and designated some BMUS species as ecosystem component species based on criteria described in the revised National Standard 1 Guidelines for determining whether species are in need of conservation and management (Figure 1; 81 FR 71858, October 18, 2016). This resulted in the further reduction of BMUS in the Fishery Ecosystem Plans (FEPs) from 16 to 13 in the Mariana Archipelago (i.e., Guam and the Commonwealth of the Northern Mariana Islands, or CNMI) and from 17 to 11 in American Samoa. Table 1 and Table 2 below show the current BMUS for American Samoa and the Mariana Archipelago, respectively.

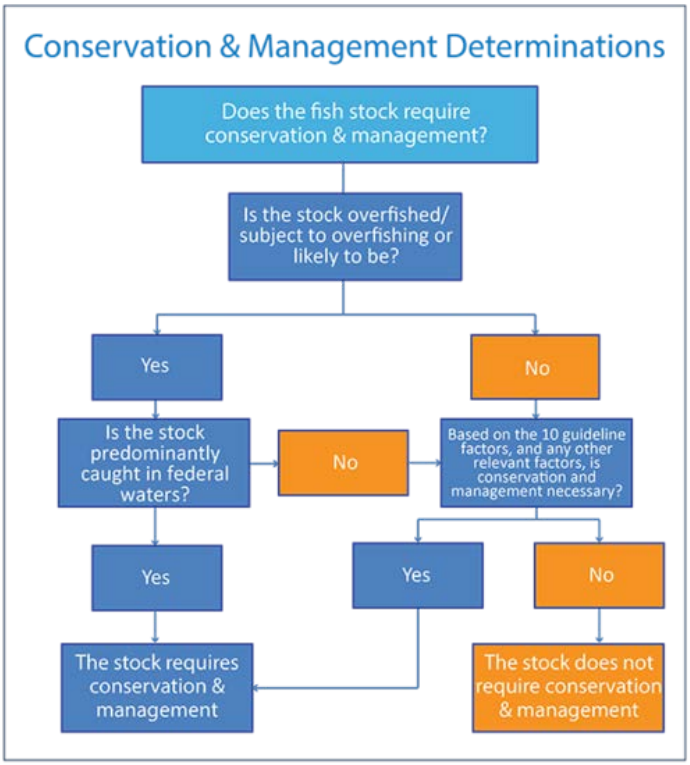


Figure 1. National Standard 1 Guidelines on Determining which Stocks Require Federal Management. The 10 guideline factors are available in the Final Rule (81 FR 71858, October 18, 2016)

Table 1. Current Bottomfish Management Unit Species in the American Samoa Fishery Ecosystem Plan

Scientific name	Common name	Local name
Aphareus rutilans	red snapper, silvermouth	palu-gutusiliva
Aprion virescens	gray snapper, jobfish	asoama
Caranx lugubris	black trevally, jack	tafauli
Variola louti	lunartail grouper	papa, velo
Etelis carbunculus	red snapper	palu malau
Etelis coruscans	red snapper	palu-loa
Lethrinus rubrioperculatus	redgill emperor	filoa-paomumu
Lutjanus kasmira	blueline snapper	savane
Pristipomoides filamentosus	pink snapper	palu-ènaèna
Pristipomoides flavipinnis	yelloweye snapper	palu-sina
Pristipomoides zonatus	Snapper	palu-ula, palu-sega

Table 2. Current Bottomfish Management Unit Species in the Mariana Archipelago Fishery Ecosystem Plan

Scientific name	Common name	Local name
Aphareus rutilans	red snapper, silvermouth	lehi/maroobw
Caranx ignobilis	giant trevally, jack	tarakitu/etam
Caranx lugubris	black trevally, jack	tarakiton attelong, orong
Variola louti	lunartail grouper	bueli, bwele
Etelis carbunculus	red snapper	buninas agaga', falaghal moroobw
Etelis coruscans	red snapper	abuninas, taighulupegh
Lethrinus rubrioperculatus	redgill emperor	mafuti, atigh
Lutjanus kasmira	blueline snapper	funai, saas
Pristipomoides auricilla	yellowtail snapper	buninas, falaghal-maroobw
Pristipomoides filamentosus	pink snapper	buninas, pakapaka, falaghal-maroobw
Pristipomoides flavipinnis	yelloweye snapper	buninas, falaghal-maroobw
Pristipomoides sieboldii	pink snapper	buninas, falaghal-maroobw
Pristipomoides zonatus	flower snapper	buninas rayao amariyu, falaghal-maroobw

These species have varying life history characteristics and have different vulnerabilities to fishing pressure. The differences between species would have ramifications on the determination of productivity and the susceptibility for each species (or groups of species) when defining stock status as a complex during stock assessments.

1.2 Fishery Description

The territorial bottomfish fisheries are predominantly small boat, single-day trip fisheries. Bottomfish are caught by both the small-scale commercial and the non-commercial sectors of the fisheries. The fisheries typically utilize vertical nylon lines with a weight at the terminal end and

several branch-lines with hooks close to a chum bag to attract bottomfish. The rig is comprised of a fiberglass pole with either a manual or electric reel. The fishery operates mostly nearshore or at the offshore banks, and the ratio of effort nearshore versus offshore has varied over time. The target species are comprised of shallow water snappers, emperors, jacks, groupers, and the deep water *Etelis* and *Pristipomoides* snappers.

In the 1980s in American Samoa, the bottomfish fishery was much larger than it is currently and landed a non-trivial amount of catch. A small commercial fishery was established in the 1970s through the government-subsidized boat-building program called the Dory Project and, subsequently, the *Alia* Program in the 1980s aimed to further develop the fishery. The fishery peaked in 1984 when 48 vessels fished for bottomfish and the landings were exported to Hawaii (Itano 1996). These relatively larger boats were able to fish the remote offshore banks, landing larger bottomfish species. The bottomfish fishery declined after these programs ended, and the remaining small boat *alia* fleet fished in the nearshore waters of Tutuila and Manu'a. In recent decades, the fishery has been primarily targeting the shallower species of the BMUS complex due to the limitation of the *alia* boats from venturing to the offshore waters (Figure 2A). However, most of these shallow species do not constitute the bulk of what is sold in the commercial markets (except in 2013 and 2014). The preferred target species are typically the deepwater snappers (Figure 2B).

In the late 1980s to early 1990s in the CNMI, there were 12 to 15 large (~70 ft) vessels based in Saipan that conducted multi-day trips for bottomfish in the Northern Mariana Islands using electric/hydraulic reels (WPRFMC 2021). This northern island fishery declined in the mid-1990s, and the remaining small boats continued to operate around the southern islands of Saipan, Rota, and Tinian. The available creel survey data for the CNMI do not provide a clear trend in terms of the proportion of shallow water versus deep water species landed (Figure 2C). However, the longer time series available from the commercial receipt books shows that deep water species are sold in the markets and that the northern island bottomfish fisheries were dominant in the 1980s and 1990s. In recent years, the shallow water species comprised only a small portion of the commercial fisheries (Figure 2D).

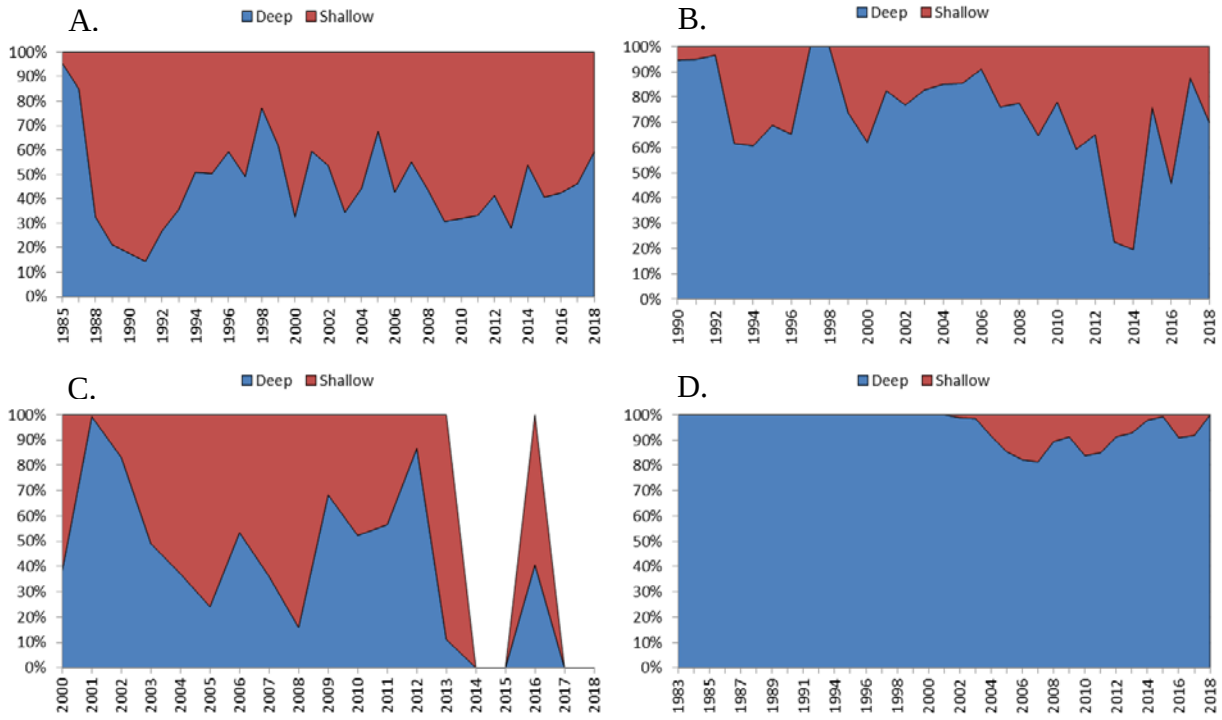
The Guam bottomfish fishery is comprised of small (<25 ft) commercial and non-commercial vessels that fish around the main island of Guam and, to some extent, at the offshore banks of Galvez and Santa Rosa (WPRFMC 2021). The bottomfish fishery used to be harvest a mix of shallow and deep water species from the 1980s to the early 1990s, after which the fishery mostly landed deep water snapper species; the proportion of the deep water species harvested has increased over time (Figure 2E). This shift was likely supported by a core group of fishermen who began to learn bottomfishing techniques from Hawaii-based bottomfish fishermen, particularly in the past two decades. The deep water BMUS in Guam, like in CNMI, comprise the bulk of the species landed in the commercial sector based on the commercial receipt book data (Figure 2F).

1.3 Current Application of the MSY Control Rules

The Western Pacific Regional Fishery Management Council (Council) is required under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to

manage the bottomfish fishery using a biomass-based reference point. Amendment 6 to the bottomfish FMP (WPRFMC 1998) described the maximum sustainable yield (MSY) control rule for the bottomfish fishery and how NMFS would make an overfished and/or overfishing determination.

The FEPs state "*The overfishing criteria and control rules specified are applied to individual species within the multi-species stock whenever possible. Where this is not possible, they will be based on an indicator species for the multi-species stock. It is important to recognize that individual species will be affected differently based on this type of control rule, and it is important that for any given species fishing mortality does not exceed a level that would lead to its becoming depleted. Currently, no indicator species are used for the four bottomfish multi-species stock complexes (American Samoa, CNMI, Guam and Hawaii). Instead, the control rules are applied to each of the four stock complexes as a whole*" (WPRFMC 2009a, 2009b). The current language in the FEPs provide flexibility on how these control rules are applied to the BMUS. This provides stock assessment scientists with the ability to determine the best approach to apply the control rules and design the assessment appropriately based on the quantity and quality of available data for each species in the BMUS complex for each island area.



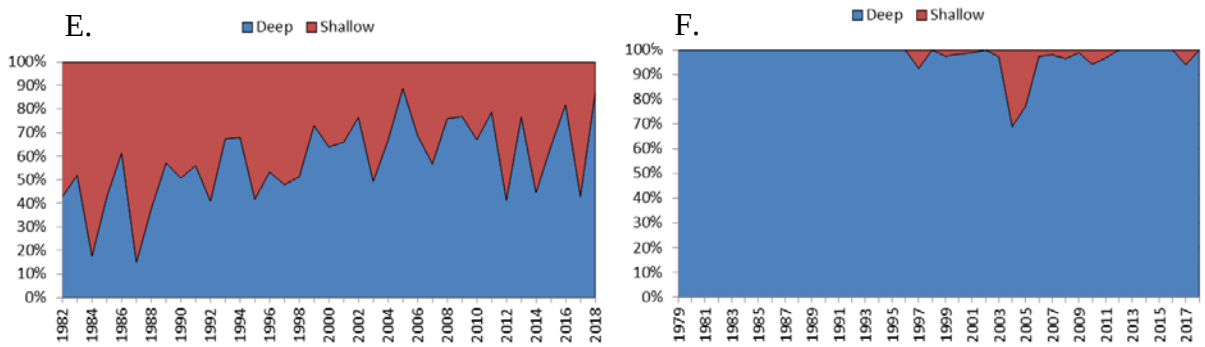


Figure 2. The proportion of estimated catch for the shallow water BMUS and the deep water BMUS from creel surveys (figures on the left) and commercial receipt books (figures on the right) in American Samoa (A and B), the CNMI (C and D), and Guam (E and F).

1.4 Purpose and Need for Action

The species composition of the BMUS is reflective of what was landed at the time the Bottomfish FMP was developed. The BMUS were refined during the Ecosystem Component Amendment to determine species that are in need of conservation and management. The bottomfish fisheries in the territories have evolved over time with the rise and fall of the large vessels, export of deep water snapper species, and a series of fisheries development projects. There is a need to revisit the designated BMUS to determine whether the current species composition of the complexes remain representative of the fisheries. There is also a need to determine if viewing the BMUS complex as individual species or in smaller groupings with similar life history characteristics would be preferable to managing the complex as a single unit with diverse species.

The purpose of this action is to refine the BMUS complexes to reflect the current state of the bottomfish fisheries in American Samoa, Guam, and the CNMI.

1.5 Action Area

The action area includes marine waters from the shoreline to 200 nm offshore around the territories of American Samoa, Guam, and the CNMI, encompassing all waters and associated marine resources within these areas. The exclusive economic zone (EEZ) around the State of Hawaii as well as Wake Island, Johnston Atoll, Howland Island, Baker Island, Jarvis Island, and Palmyra Atoll, and Kingman Reef (i.e., the Pacific Remote Island Area, or PRIA) are not included in this action.

CHAPTER 2. Development of the Options

2.1 Development of Options for the Reclassification of the Bottomfish Management Unit Species Action

At the 180th Council meeting in October 2019, the Guam Advisory Panel (AP) recommended the Council request PIFSC to separate the shallow water bottomfish complex from the deep water bottomfish complex as recommended by the Guam AP at its June 2019 meeting.

The AP also indicated that the 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" is relevant. The Council, at its 180th meeting, directed staff to develop an options paper for the revision 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. In addition, the Council requested that, for future benchmark assessments, the Western Pacific Stock Assessment Review (WPSAR) Steering Committee incorporate into its schedule a data preparation workshop to be held prior to the WPSAR review for the subsequent stock assessments for territorial bottomfish, which, for example, could improve CPUE standardization in future assessments. The Council also recommended that the workshop include members of the Council's Scientific and Statistical Committee (SSC) as well as the fishing community given their knowledge of the stock and fishery under assessment.

The options under consideration by the Council were developed in coordination with the Pacific Island Fisheries Science Center (PIFSC)-Stock Assessment Program (SAP). The PIFSC-SAP conducted an inventory of available data for each species in the current BMUS in American Samoa. Based on this data evaluation, recommendations were provided on how to refine the BMUS list with a higher degree of resolution to allow for the generation of stock assessments that has finer resolution compared to an aggregate complex. As a result of the data evaluation for American Samoa bottomfish fisheries, at its 189th meeting in December 2021, the Council requested the PIFSC-SAP to continue its development of single-species, age-structured stock assessments for the territorial bottomfish fisheries that would more heavily rely on length and life history data as opposed to the relatively uncertain catch and effort information. The Council expects that the PIFSC-SAP will conduct similar data evaluations for the Guam and CNMI bottomfish fisheries prior to the next benchmark stock assessment for the bottomfish fisheries in those island areas. Additionally, PIFSC developed a cluster analysis on species harvested in the nearshore boat-based fisheries of each of the territories, and, also at its 189th meeting, the Council requested that PIFSC provide a report on the analysis. The cluster analysis will be used as a basis to provide scientific advice on the linkages between the species that could comprise the BMUS complex based on available fishery-dependent and life history data. In combination with the data evaluation, the cluster analysis on species to potentially include in the BMUS complex will better inform which species should be included as BMUS that can be assessed at a finer scale than the previous stock assessments that determined stock status for the BMUS complex as a whole.

2.2 Options for Reclassifying the Bottomfish Management Unit Species

The following options are under consideration.

2.2.1 Option 1: No Action (Status Quo)

Under Option 1, the BMUS lists in the FEPs would not be revised and the complexes would remain a diverse set of species that have varying life history characteristics in each territorial island area. Thus, Option 1 would retain the complex composition for BMUS as described in Table 1 and Table 2. The recent stock assessments that analyzed the BMUS in each

island area as a single complex (Langseth et al. 2019) would remain to be the Best Scientific Information Available (BSIA) until the next stock assessment is completed for each fishery, which will also determine stock status for the same group of species as the previous assessment. Each BMUS complex would be managed as a single fishery under a conservative catch projection estimate that could potentially suppress sectors of the fishery. For Guam, this option disregards the distinction between shallow and deep water bottomfishing by those considered to specialize in shallow-water, primarily non-commercial, bottomfishing and deepwater bottomfishing methods. This option would not consider other species that may be part of the fisheries as they evolved over time.

Under the No Action option, all other Magnuson-Stevens Act requirements would remain the same, and particularly, requirements associated with status determination criteria, essential fish habitat, fishery and bycatch monitoring, human communities, and ACL and AM specifications would be unchanged. This option would also maintain the current level of coordinated management (or lack thereof) between the territorial and federal agencies.

2.2.2 Option 2: Amend the FEP to revise the BMUS complex based on the PIFSC cluster analysis and life history synthesis

Under Option 2, the Council would amend the American Samoa and Mariana Archipelago FEPs to redefine the BMUS complexes based on the best scientific information available, including the PIFSC cluster analysis (Ahrens et al. 2022), the subsequent life history synthesis, and input from stakeholders. The new BMUS lists (Table 3 and Table 4)would be comprised only of deepwater snappers, while the shallow water species would be removed from the 2019 BMUS list and placed under the territorial FMPs (Table 5 and Table 6).

Table 3. Proposed Bottomfish Management Unit Species under the federal Fishery Ecosystem Plan in American Samoa

Scientific name	English name	Local name
Aphareus rutilans	red snapper, silvermouth (lehi)	palu-gutusiliva
Etelis boweni	giant red snapper	-
Etelis carbunculus	red snapper (ehu)	palu malau
Etelis coruscans	red snapper (onaga)	palu-loa
Pristipomoides argyrogrammicus	ornate jobfish	-
Pristipomoides auricilla	yellowtail snapper	palu'i’usama, palu-ave
Pristipomoides filamentosus	pink snapper (opakapaka)	palu-ènaèna
Pristipomoides flavipinnis	yelloweye snapper	palu-sina
Pristipomoides seiboldii	pink snapper (kalekale)	-
Pristipomoides zonatus	flower snapper	palu-sega, palu-ula
Pristipomoides multidens	goldbanded jobfish	palu-sina-ugatele
Paracaesio stonei	cocoa snapper	
Paracaesio kusakarii	saddle-back snapper	palu-tuauli, mu-sina

Table 4. Proposed Bottomfish Management Unit Species under the federal Fishery Ecosystem Plan in Guam

Scientific name	English name	Local name
Aphareus rutilans	red snapper, silvermouth	lehi, maroobw
Etelis boweni	giant red snapper	-
Etelis carbunculus	red snapper (ehu)	buninas agaga', falaghal moroobw
Etelis coruscans	red snapper (onaga)	abuninas, taighulupegh
Pristipomoides argyrogrammicus	ornate jobfish	
Pristipomoides auricilla	yellowtail snapper	buninas, falaghal-maroobw
Pristipomoides filamentosus	pink snapper (opakapaka)	buninas, pakapaka, falaghal-maroobw
Pristipomoides flavipinnis	yelloweye snapper	buninas, falaghal-maroobw
Pristipomoides seiboldii	pink snapper (kalekale)	buninas, falaghal-maroobw
Pristipomoides zonatus	flower snapper (gindai)	buninas rayao amariyu, falaghal-maroobw

Table 5. Proposed Bottomfish Management Unit Species to be transitioned to the federal Ecosystem Component Species and to be picked up in the territorial Fishery Management Plan in American Samoa

Scientific name	English name	Local name
Aprion virescens	green jobfish	asoama
Caranx lugubris	black jack	tafauli
Variola louti	yellow-edged lyretail	papa, velo
Lethrinus rubrioperculatus	spotcheek emperor	filoa-paomumu
Lutjanus kasmira	bluestripe snapper	savane

Table 6. Proposed Bottomfish Management Unit Species to be transitioned to the federal Ecosystem Component Species and to be picked up in the territorial Fishery Management Plan in Guam

Scientific name	English name	Local name
Caranx ignobilis	giant trevally	tarakitu, etam
Caranx lugubris	black jack	tarakiton attelong orong
Variola louti	yellow-edged lyretail	bueli, bwele
Lethrinus rubrioperculatus	spotcheek emperor	mafuti, atigh
Lutjanus kasmira	bluestripe snapper	funai, saas

Under this option, the Council would retain the current flexibility in the application of the biological reference point control rule depending on the quantity and quality of data available for the development of the stock assessment, whether it be on the species level, on the complex level, or with the use of indicator species. Thus, the PIFSC-SAP may decide to perform a single stock assessment on the BMUS complex in an island area as a whole, perform individual stock assessments on each species in the complex, perform individual stock assessments on indicator

species to represent the larger complex, or some combination of these methods, depending on the nature of the information available for incorporation into the stock assessment.

On October 18, 2016, NMFS issued a final rule revising the National Standard 1 Guidelines, including changes to guidance on the use of indicator stocks for stock complexes (81 FR 71858). According to CFR § 600.310(d)(2)(ii), an indicator stock is "a stock with measurable and objective status determination criteria (SDC) that can be used to help manage and evaluate more poorly known stocks that are in a stock complex," and stock complexes should include at least one indicator stock where practicable. Previously, NMFS and the Council managed territorial BMUS complexes as several stocks without an indicator stock, with SDC and an ACLs for the complexes as a whole. An indicator stock, if utilized, should be representative of the typical vulnerability of the stocks within the complex, or the indicator stock should better represent the more vulnerable stocks within the complex if the species comprising the complex have a wide range of vulnerability. Thus, under Option 2, the PIFSC-SAP would have the flexibility to determine if management under the use of indicator stocks would be appropriate and, if so, would have the discretion to select indicator stock(s) to be used to represent the amended territorial BMUS complexes in stock status determinations through stock assessments considering any available life history information and other available data, which may be informed by the outcomes of data preparatory workshops preceding the development of a stock assessment.

Under this option, the Council would retain the language of the FEPs that provides flexibility on how to apply the MSY control rules, therefore providing the PIFSC-SAP flexibility in the decision on how to apply the appropriate SDC based on the quality and quantity of data available for BMUS selected as indicator stocks, if indicator stocks are used. Because indicator stocks would be assessed in lieu of determining stock status for each individual species in the complex, there may be some additional flexibility for the PIFSC-SAP in the decision of which species to assess as an indicator and its associated SDC. The fishery will be analyzed appropriately based on the available data for the BMUS and selection of indicator species, which would be informed through initial data preparatory workshops. The PIFSC-SAP could also decide, based on the language in the FEPs, to perform single-species stock assessments for the BMUS in the future if data availability allow for such an analysis.

In the development of a new benchmark assessment, PIFSC-SAP will consult with the territorial fishery management agencies (i.e., the Department of Marine and Wildlife Resources, or DMWR, in American Samoa and the Division of Aquatic and Wildlife Resources, or DAWR, in Guam) and local fishing communities to better identify and describe the data that may be incorporated into the assessment. A series of data preparatory workshops would seek consensus on the types and extent of data that could be used in the new benchmark stock assessment to garner support from stakeholders and management partners. Through the data preparatory workshops, the fishing community could provide their insights on the changes in the fishery over time for the species comprising the revised BMUS lists.

Under this option, the shallow-water species would be moved to the territorial FMPs that are currently under development and would be managed by the territorial fishery management agencies (i.e., the DMWR in American Samoa and DAWR in Guam). However, this option does

not preclude the inclusion of the deepwater species in the territorial FMPs, especially if the deepwater habitats occur in territorial waters; representatives from DMWR have already committed to listing the deepwater species that would comprise the BMUS list in the federal FEP into the list of species managed under the territorial FMP (Ochavillo pers. comm., February 11, 2022). The inclusion of deepwater BMUS managed under the federal FEP into the territorial FMP would further enhance the coordinated management of important deepwater bottomfish species between the territorial and federal management agencies.

If species would be removed from the federal FEP, federal managers should utilize the 10 factors (referenced in Figure 1) from the National Standard 1 Guidelines on Determining which Stocks Require Federal Management (81 FR 71858, October 18, 2016) to determine if a species is or is not in need of federal management in the reclassification of the BMUS complexes. Normally, a species that is overfished or experiencing overfishing could not be removed from federal management, but in the case of the territorial BMUS, the species are managed as a complex and the contribution of each individual species to the overfished and/or overfishing determination is not clear. If the application of the 10 factors for a particular species indicates that the species is not in need of federal conservation and management, the species may be removed from the complex under the FEP. At this stage, species that would be eliminated from the complexes could either be classified as an Ecosystem Component Species or completely removed from the FEPs. However, under Option 2, species would not solely be removed from the BMUS list in the federal FEPs but would be transitioned to be managed under the territorial FMPs currently being developed. While no federal mechanism exists to force territorial FMPs to adopt species that were previosuly managed under the federal FEP, representatives from the American Samoa DMWR (Ochavillo pers. comm., February 11, 2022) and Guam DAWR (Biggs pers. comm., February 7, 2022) each explicitly indicated that the territorial management agencies would adopt the shallow-water species removed from the federal FEP into their territorial FMP.

Option 2 would also address previous recommendations by the Guam AP to perform separate stock assessments for the apparent deep and shallow water bottomfish complexes in the Mariana Archipelago, as PIFSC would conduct stock assessments on individual species, on the disparate shallow and deep water species complexes, or using indicator stocks rather than considering all species of each of the complexes together.

Changing the BMUS complexes, would also require revising the following requirements for the complexes associated with the Magnuson-Stevens Act:

- Status determination criteria, including optimum yield;
- Essential fish habitat (EFH) and habitat areas of particular concern (HAPC);
- ACL and AM specification mechanism, including the application of the 600.310(h)(2) provision;
- Fishery and bycatch monitoring (both commercial and non-commercial sectors); and
- Human communities and fishery participants.

2.3 Advisory Group Action

The Council Advisory Groups will discuss the viability of each of these options and provide input on the reclassification of the BMUS complexes in each of the territorial island

areas (i.e., American Samoa, Guam, and the CNMI) before making a recommendation to the Council.

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