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**Options for Reclassification of the Bottomfish Management Unit
Species of 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 Plan (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 is 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 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 BMUS for American Samoa and the Mariana Archipelago, respectively.

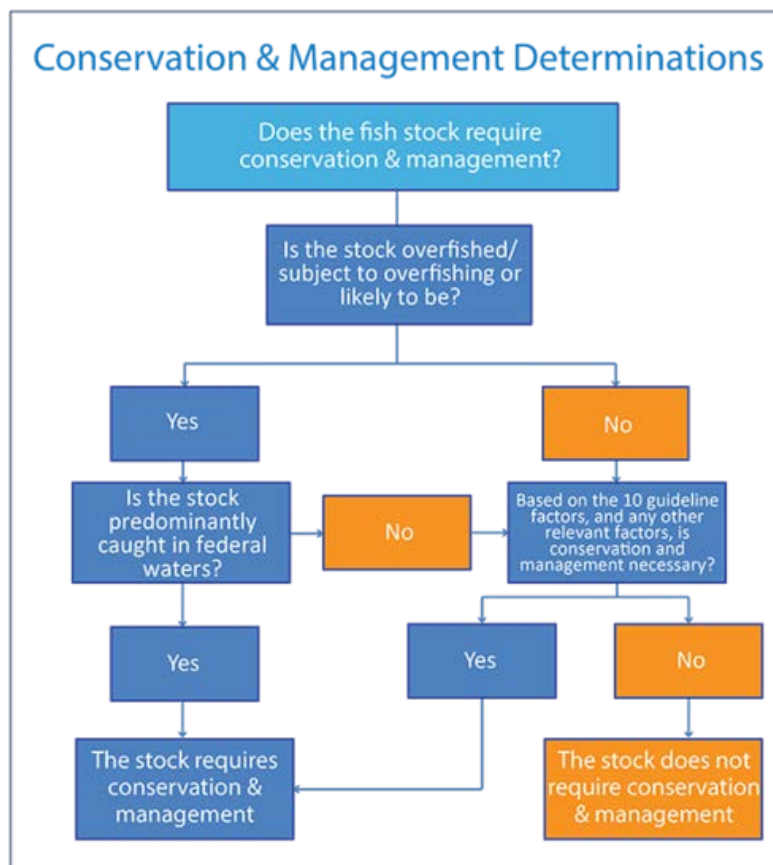


Figure 1. National Standard 1 Guidelines on Determining which Stocks Require Federal Management. The 10 guideline factors are available in the Final Rule (81 FR 71858, October 18, 2016)

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

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

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

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

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.

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 and groups 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 at further developing 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 near-shore 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 1A). 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 1B).

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 1C). 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 1D).

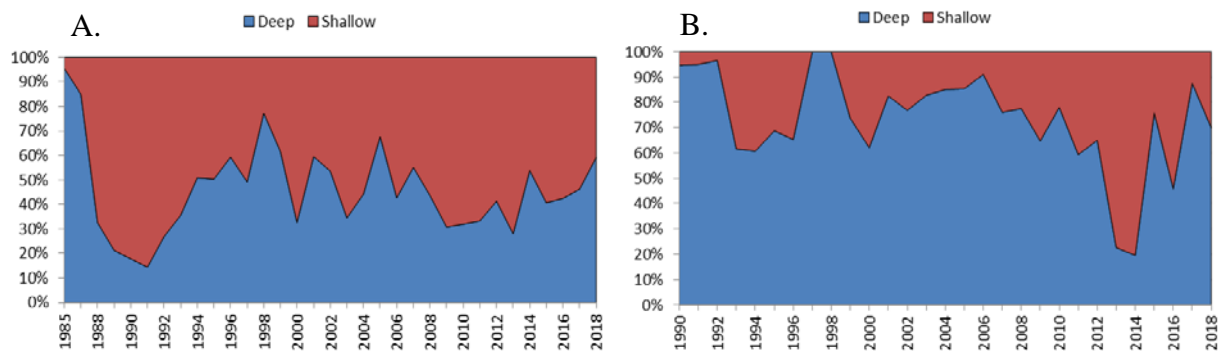
The Guam bottomfish fishery is comprised of small (<25 ft) commercial and non-commercial vessels that fish around the main island of Guam and, to some extent, at the offshore banks of Galvez and Santa Rosa (WPRFMC 2021). The bottomfish fishery used to harvest a mix of shallow and deep water species from the 1980s to the early 1990s, after which the fishery mostly landed deep snapper species; the proportion of the deep water species harvested is

increasing over time (Figure 1E). 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 1F).

1.3 Current Application of the MSY Control Rules

The Western Pacific Regional Fishery Management Council (the Council) is required to manage the bottomfish fishery using a biomass-based reference point under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Amendment 6 to the bottomfish FMP (WPRFMC 1998) described the maximum sustainable yield (MSY) control rule for the bottomfish fishery on how it would make an overfished and overfishing determination. 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).

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.*



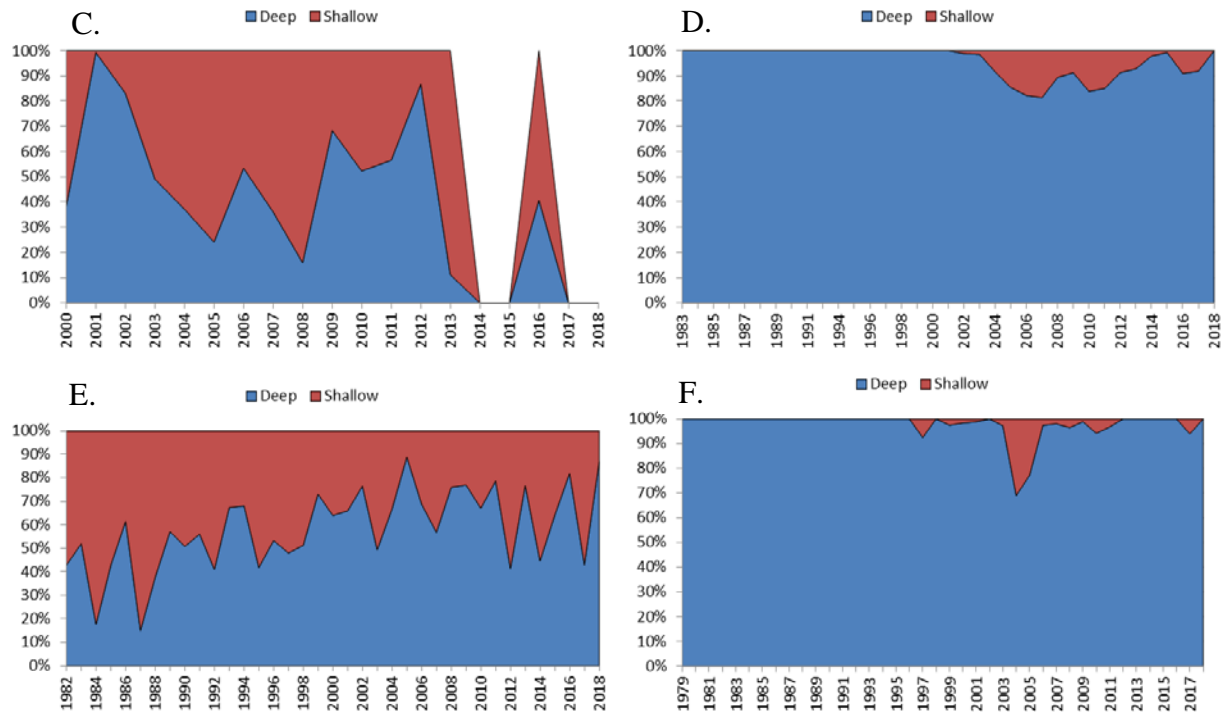


Figure 2. The proportion of estimated catch for the shallow water BMUS and the deep water BMUS from creel surveys (figures on the left) and commercial receipt books (figures on the right) in American Samoa (A and B), the CNMI (C and D), and Guam (E and F).

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 view the BMUS complex not as single unit with diverse species but potentially as individual species or with smaller groupings with similar life history characteristics.

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 covers 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 & Baker, Jarvis and Palmyra & Kingman (i.e., the Pacific Remote Island Areas, 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 meeting. The AP also pointed to the recommendation at the Data 2000 Workshop in 1996 to “investigate methods for separating and analyzing data and information on the shallow and deep bottomfish complexes.” 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 a stock assessment 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 a single-species, age-structure stock assessment for the territorial bottomfish fisheries that would more heavily rely on length and life history data instead of the relatively uncertain catch and effort information. It is expected that the PIFSC-SAP will conduct similar data evaluations for the Guam and CNMI bottomfish fisheries prior to the next benchmark stock assessment. 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 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 are the options under consideration.

2.2.1 Option 1: No Action (Status Quo)

Under Option 1, the BMUS lists in the FEPs would not be reclassified with smaller biological units, and the complex would remain a diverse set of species that have varying life history characteristics. The recent stock assessment 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 would 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. In the case of Guam, the No Action option disregards the distinction between deep water bottomfishing by those considered to specialize in deepwater bottomfishing methods and shallow-water, primarily non-commercial, bottomfishing.

2.2.2 Option 2: Amend the FEP to revise the BMUS complex based on the PIFSC cluster analysis and manage the complex at a species level

Under Option 2, the Council would amend the American Samoa and Mariana Archipelago FEPs to define the BMUS fisheries as single-species fisheries, which would allow the highest resolution during stock assessments to determine stock status. This reclassification would be informed by the cluster analysis performed by PIFSC as well as any available information from data evaluations generated by the PIFSC-SAP. The Council expects the PIFSC cluster analysis to provide scientific advice on the linkages between species frequently harvested in nearshore, boat-based fisheries that target bottomfish and other associated species. The data evaluations would allow PIFSC-SAP to apply the appropriate status determination criteria based on the quality and quantity of data available for each reclassified BMUS when performing single-species assessments. Option 2 would address previous recommendations by the Guam AP to perform separate stock assessments for the apparent deep and shallow water bottomfish complexes, as PIFSC would conduct stock assessments on each individual BMUS rather than considering all species of the complex together.

By amending the FEPs to define BMUS as single-species bottomfish fisheries, the Council and PIFSC will lose the flexibility on how to apply the MSY control rule. That is, each defined fishery species would have specific status determination criteria (SDC). The fishery would have to be monitored according to how the fishery is defined, and the stock assessment would have to apply that SDC to each individual species.

The current stock assessment (Langseth et al. 2019) will remain the BSIA until a new assessment is generated, which is expected between 2023 and 2025 for the bottomfish fisheries in each of the island areas. Until the finalization of the subsequent stock assessments, the territorial bottomfish fisheries will continue to be subject to their current conservative management regimes. After the WSPAR review of the BMUS reclassification, the subsequent stock assessments would be based on the new groupings.

In the generation of a new benchmark assessment, PIFSC-SAP will be consult with the territorial fishery agencies and local fishing communities to define the data that will go into the assessment. This series of data preparatory workshops will seek consensus on the types of data

and extent of the data that will be used in the new benchmark to garner buy-in from the partners. Through the data preparatory workshops, the fishing community can provide their insights on the changes in the fishery over time and reclassification of the BMUS. The decision on how to refine the BMUS will inform efforts for the data preparatory workshop.

2.2.3 Option 3: Amend the FEP to revise the BMUS complex based on the PIFSC cluster analysis and manage the complex using indicator stocks

Under Option 3, the Council would amend the American Samoa and Mariana Archipelago FEPs to reclassify the listed BMUS and manage the complex using indicator stocks based on single-species stock assessments. This would allow for stock assessments to be completed at a finer resolution than the most recent assessment (Langseth et al. 2019), but not as fine as under Option 2 due to the utilization of indicator stocks. Similar to Option 2, this reclassification would be informed by the cluster analysis performed by PIFSC as well as any available information from data evaluations generated by the PIFSC-SAP. The Council expects the PIFSC cluster analysis to provide scientific advice on the linkages between species frequently harvested in nearshore, boat-based fisheries that target bottomfish, and the analysis would inform the most applicable indicator stocks that would be most representative of the complex as a whole. The data evaluations would allow PIFSC-SAP to determine appropriate indicator stocks for assessment apply the appropriate status determination criteria based on the quality and quantity of data available those indicator stocks. Option 3 would also address previous recommendations by the Guam AP to perform separate stock assessments for the apparent deep and shallow water bottomfish complexes, as PIFSC would conduct stock assessments on individual indicator stocks rather than considering all species of the complex together.

On October 18, 2016, National Standard 1 Guidelines were revised, 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 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, the territorial BMUS complexes have been managed as several stocks without an indicator stock, with SDC and an ACL for the complex 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 3, the PIFSC-SAP would have the discretion to select indicator stock(s) to be used to represent the amended territorial BMUS complexes 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, providing the PIFSC-SAP flexibility to apply the appropriate status determination criteria based on the quality and quantity of data available for BMUS selected as indicator stocks. The use of indicators may reduce flexibility on how the MSY control rules can be applied but not to the same extent as Option 2. 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.

Similar to Option 2, the current stock assessment (Langseth et al. 2019) will also remain the BSIA until a new assessment is generated under Option 3. When generating the new benchmark assessment, PIFSC-SAP would follow the same steps described under Option 2, including holding data preparatory workshops and consulting with the territorial fishery agencies and local fishing communities to define the data that will go into the assessment.

2.3 Advisory Group Action

The Council Advisory Groups will discuss the viability of each of these options provide input on the reclassification of the species in the BMUS complex before making a recommendation to the Council.

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