WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

DRAFT Environmental Assessment

Annual Catch Limits and Accountability Measures for Main Hawaiian Islands Gray Jobfish (*Aprion virescens*)

(RIN 0648-BK90)

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Abstract

The National Marine Fisheries Service (NMFS) will implement annual catch limits (ACL), Annual Catch Targets (ACTs), and accountability measures (AM) for the gray jobfish, *Aprion virescens*, also known as "uku," in the U.S. Exclusive Economic Zone around the main Hawaiian Islands, as recommended by the Western Pacific Fishery Management Council (Council). The ACLs and AMs will apply to uku catches for fishing years 2022, 2023, 2024, and 2025.

Historically, uku has been managed as part of the main Hawaiian Islands non-Deep 7 bottomfish stock complex. In March of 2019, NMFS designated numerous management unit species (MUS), including reef fish and non-deep 7 bottomfish, as Ecosystem Component Species (or ECS). Uku is now the only remaining MUS from the non-Deep 7 complex. Other species such as white ulua (*Caranx ignoblis*), black ulua (*C. lugubris*), yellowtail kalekale (*Pristipomoides auricilla*), and butaguchi (*Pseudocaranx dentex*) have all been designated as ECS. ACLs are not required for ECS; therefore, the proposed 2022–2025 ACLs, ACTs, and AMs discussed in this environmental assessment (EA) are for uku only.

The Council developed the proposed ACLs, ACTs, and AMs for uku in fishing years 2022, 2023, 2024, and 2025 in accordance with requirements of the Magnuson-Stevens Fishery Conservation and Management Act and with the approved processes in the Fishery Ecosystem Plan for the Hawaiian Archipelago. The fishing year for uku runs from January 1 through December 31 annually. At its 183rd meeting in September 2020, the Council recommended that

NMFS implement an ACL of 295,419 lb of uku in each fishing year 2022, 2023, 2024 and 2025. This ACL recommendation from Council was for combined commercial and non-commercial fishery catch. Previously recommended ACLs have been specific to only commercial uku catch. The Council reiterated its recommendation for an ACL of 295,419 lb at its 186th meeting in June 2021, with the addition of a recommendation for an annual catch target (ACT) of 291,010 lb, again for combined commercial and non-commercial catch. The Council recommendation from the 186th meeting also included an in-season AM and a post-season AM, which matches recommendations for AMs in the uku fishery at Council meetings where specific uku-only management measures were first considered (171st Council meeting, October 2017). At its 187th meeting in September, 2021, the Council took final action reiterating its recommendation for ACLs of 296,419 lb, ACTs of 291,010 lb, and both in-season and post-season AMs that would apply to combined commercial and non-commercial catch in fishing years 2022, 2023,2024 and 2025.

Under the proposed in-season AM, when NMFS projects that the combined commercial and non-commercial catch will reach the ACT, NMFS will close Federal waters to the retention of uku by notice in the *Federal Register*. NMFS and the Council will monitor commercial and non-commercial catches of uku in-season in both State and Federal waters on a monthly basis through data collected by the State of Hawaii (Commercial Fishing Reports and Hawaii Marine Recreational Fishing Survey) and NMFS (Marine Recreational Information Program) and will use these data to monitor catch relative to the ACT. The Council and its Scientific and Statistical Committee (SSC) recognize that the State of Hawaii does not have a regulation allowing it to implement a coordinated closure of State waters should the uku ACT be reached, but the State commercial catch program does require reporting of discards, which would allow the Council, NMFS and the State to monitor regulatory discards in the fishery in the event of a Federal fishery closure. As a post-season AM, after the end of each fishing year, if NMFS and the Council determine that the average catch from the most recent three-year period exceeds the ACL, NMFS would reduce the ACL in the subsequent fishing year by the amount of the overage.

NMFS and the Council prepared this EA to evaluate the potential environmental impacts of the proposed ACL, ACT, and AMs. The EA includes a description of the information and methods used by the Council to develop the proposed ACLs, ACTs, and AMs and analyzes a range of alternatives. The EA describes the affected environment and the potential effects of the fishery on target and non-target stocks and protected species, among other factors. Preliminary analyses indicate that none of the alternatives are likely to substantially change the uku fishery. The combined commercial and non-commercial fishery has landed an annual average of 219,000 lb of uku in the past five years and, therefore, is unlikely to be constrained by the proposed ACL. If a closure of Federal waters is needed because uku catch was approaching the ACT in a given year, based on catch to date and historical fishery performance, a closure would be most likely to occur near the end of a fishing year. Thus, NMFS does not expect that the proposed in-season AM is not expected to result in a large change to the fishery, and fishermen would likely shift their effort to Deep 7 bottomfish.

Management of both the commercial and non-commercial uku fishery under the proposed ACLs, ACTs, and AMs is intended to prevent overfishing and provide for continued sustainable harvest of the uku resource in the main Hawaiian Islands.

On DATE, 2021, NMFS solicited public comment on the proposed action and draft EA for this action. The comment period ended DATE, 2021. NMFS received public comments that generally supported the rule. Find the draft and final versions of this EA by searching on RIN 0648-BK90 at www.regulations.gov, or by contacting the responsible NMFS official or the Council at the above address.

ABBREVIATIONS

ABC – Acceptable Biological Catch
ACL – Annual Catch Limit
ACT – Annual Catch Target
AM – Accountability Measure
BMUS – Bottomfish Management Unit Species
Council – Western Pacific Fishery Management Council
CFR – Code of Federal Regulations
CML – Commercial Marine License
CPUE – Catch per Unit of Effort
DLNR – Hawaii Department of Land and Natural Resources
EA – Environmental Assessment
ECS – Ecosystem Component Species
EEZ – Exclusive Economic Zone
FEP – Fishery Ecosystem Plan
FMP – Fishery Management Plan
FR – *Federal Register*
HMRFS – Hawaii Marine Recreational Fishing Survey
lb – pound or pounds
MHI – main Hawaiian Islands
MFMT – Maximum Fishing Mortality Threshold
MRIP – Marine Recreational Information Program
MSST – Minimum Stock Size Threshold
MSY – Maximum Sustainable Yield
mt – metric tons
MUS – Management Unit Species
NEPA – National Environmental Policy Act
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration, U.S. Dept. Commerce
NOAA OLE – NOAA Office of Law Enforcement
NWHI – Northwestern Hawaiian Islands
OFL – Overfishing Limit
P* – Acceptable Risk or Probability of Overfishing
PIFSC – NMFS Pacific Islands Fisheries Science Center
SEEM – Social, economic, and ecological considerations, or management uncertainty
SFD - Sustainable Fisheries Division
SPR – Spawning Potential Ratio
SSC – Scientific and Statistical Committee of the Council
UVS – Underwater Visual Survey
WPFMC – Western Pacific Fishery Management Council

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1 INTRODUCTION

The National Marine Fisheries Service (NMFS) will implement annual catch limit (ACLs), annual catch targets (ACTs) and accountability measures (AMs) for uku (*Aprion virescens*) or gray jobfish in the main Hawaiian Islands (MHI) in fishing years 2022, 2023, 2024, and 2025. NMFS prepared this Environmental Assessment (EA) in accordance with the requirements of National Oceanographic and Atmospheric Administration's (NOAA) Administrative Order (NAO) Section 216-6A for "Compliance with the National Environmental Policy Act", Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands" and the associated Companion Manual. NAO 216-6A requires review under the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and other related authorities including review of environmental consequences on the human environment prior to making a decision. Section 1 of this EA provides background information to understand the fishery, the proposed alternatives, and the purpose and need for action. The proposed alternatives are described in Section 2. The affected environment and analyses of the potential impacts on the human environment are in Sections 3 and 4, respectively. Compliance with other applicable laws and coordination with others is found in Section 5. References cited are listed in Section 6. Draft proposed regulations are included in Section 7.

1.1 Background Information

As authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), NMFS and the Western Pacific Fishery Management Council (Council) manage fisheries for bottomfish in Federal waters (the U.S. Exclusive Economic Zone or EEZ) around the Hawaiian Islands. They manage fisheries in accordance with the Fishery Ecosystem Plan for the Hawaii Archipelago (Hawaii FEP) and implementing regulations at Title 50 Code of Federal Regulations, Part 665 (50 CFR 665). This action pertains to management of the uku, a bottomfish species. At present, the only active fisheries for uku in Hawaii are in the MHI, which includes the islands of Niihau, Kauai, Oahu, Molokai, Lanai, Kahoolawe, Maui, and Hawaii.[1]

Prior to 2019, NMFS and the Council managed bottomfish management unit species (BMUS) in the MHI as two separate multi-species stock complexes[2]: the MHI Deep 7 stock complex and the MHI non-Deep 7 stock complex. On February 8, 2019, NMFS published a final rule (84 FR 2767) to reclassify certain MUS as ecosystem component species (ECS). This rule reclassified all of the non-Deep 7 bottomfish as ECS except uku. ECS remain in the FEP but are not subject to ACLs or AMs. Management of uku alone first began in 2019, with ACLs and AMs implemented for the species in accordance with the Magnuson-Stevens Act and the Hawaii FEP applying to the commercial fishery only. With this action, uku management will now include both commercial and non-commercial uku fisheries and ACTs in Federal waters.

[1] Historically the fisheries for Hawaii bottomfish operated in two management subareas: the inhabited MHI, and the Northwestern Hawaiian Islands (NWHI), a 1,200 nm chain of largely uninhabited islets, reefs, and shoals. In 2009, NMFS closed the NWHI fishery in accordance with provisions of the Presidential Proclamation establishing the Papahānaumokuākea Marine National Monument and prohibiting commercial fishing (71 FR 51134, August 29, 2006).

[2] The Magnuson-Stevens Act defines the term "stock of fish" to mean a species, subspecies, geographic grouping, or other category of fish capable of management as a unit. Federal regulations at 50 CFR 660.310(c) defines "stock complex" to mean a group of stocks that are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that the impact of management actions on the stocks is similar.

Uku is a snapper (Family: Lutjanidae) that is an important species in bottomfish fisheries in Hawaii. Its habitat includes open waters of deep lagoons, channels, or seaward reefs from the surface to depths of 230 m (WPFMC 2016). Commercial fishermen catch uku using multiple methods and gear types, including vertical handline and trolling, though over 90% of reported commercial catch comes from handline fishing (WPFMC 2018). While most bottomfish species are caught along the steep drop-offs and slopes that surround the islands and banks, uku is different in that it is primarily caught on the tops, not the sides or slopes, of these banks. More detail on this species and the fisheries targeting it are provided in Section 3.

Fishery regulations require NMFS to implement ACLs for both the MHI Deep 7 bottomfish species complex and the uku stock, and to implement AMs along with the ACLs. The proposed action analyzed in this EA focuses on the ACLs, ACTs, and AMs for uku. The MHI Deep 7 bottomfish fishery is subject to a separate ACLs and AMs, which are not part of the current proposed action. For management purposes, the fishing year for uku begins on January 1 and ends on December 31 annually. See 50 CFR 665 – Subpart C for Federal regulations applicable to bottomfish fishing in Hawaii. Fishermen must comply with Federal requirements for gear restrictions, vessel identification, commercial and non-commercial fishing permits, limited access area permits, landing receipts from limited access areas, commercial catch and effort logbooks, and federal fishery closures, should a closure be implemented.

The State of Hawaii also regulates bottomfish fishing and requires all commercial fishermen to annually obtain a commercial marine license (CML) and report all catch of uku and most other fish in both State and Federal waters on a monthly basis via a mandatory commercial catch reporting system consisting of either paper or web-based logs. NMFS and the Council monitor commercial catches of uku through these data, and it forms part of the information used to monitor catch relative to the ACLs and ACTs. Commercial catch from State and Federal waters will count towards the ACL.

If NMFS closes the uku fishery in Federal waters because it is projected to reach an ACT, the Hawaii Department of Land and Natural Resources (DLNR) currently does not have the authority to close the uku fishery in State waters. Authority to enact an in-season fishery closure for uku would have to be enabled through the State administrative rule making process. At this time, the State of Hawaii has not initiated their rulemaking process to enact such a rule. Until such time as the State does, a fishery closure for uku in Federal waters would not restrict fishing and harvests in State waters. Approximately two thirds of commercial uku catch comes from Federal waters (Harvey and Associates 2017), while non-commercial uku catch is largely from State waters, so closure of a Federal waters would reduce commercial uku catch substantially but not to the same extent for non-commercial catch.

The State of Hawaii prohibits commercial sale of uku smaller than one pound and prohibits spearing uku smaller than one pound. See the DLNR website for all state regulations applicable to bottomfish fishing in Hawaii.

1.1.1 Overview of the ACL, ACT, and AM Implementation Process

Uku fishermen have been subject to ACLs and AMs since 2012, when the requirement to have an ACL and AM was first implemented for non-Deep 7 bottomfish. Federal regulations at 50 CFR 665.4 (76 FR 37285, June 27, 2011) require NMFS to implement an ACL and AM(s) for all Hawaii BMUS, as recommended by the Council, and to consider the best available scientific, commercial, and other information about the fishery for that stock or stock complex. Federal regulations as 50 CFR 665.4 also allow the specification of an ACT that is less than the ACL as recommended by the Council. This section provides an overview of the process the Council used to develop its ACL, ACT, and AM(s) recommendation for uku.

In accordance with the Magnuson-Stevens Act and the FEPs, there are three required elements in the development of an ACL and ACT. The first requires the Council's Statistical and Scientific 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 (MFMT). 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 FEPs 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. Uku is considered a Tier 3 stock based on the 2020 stock assessment (Nadon et al. 2020). 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 Hawaii FEP includes a qualitative process by which the 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[3] (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. The Council may also use an ACT for ins--season AMs to further reduce the probability that the fishery does not exceed the ACL.

The Council has recommended NMFS implement an ACT and two AMs for the uku fishery: an in-season fishery closure for uku if NMFS and the Council anticipate the fishery may meet the ACT before the end of the fishing year, and a post-season evaluation of whether and by how much the catch exceeded the ACL (known as an "overage"). The recommendation for in-season monitoring of uku catch was implemented previously although previous in-season AMs for uku applied only to commercial catch. Including both commercial and non-commercial catch for in-season monitoring will provide additional oversight to ensure the sustainability of this fishery. The post-season AM has been used in conjunction with all previous ACLs, both for uku as part of the non-Deep 7 bottomfish complex and for previous uku-only management. This AM is based on the average catch over three years: if the Council determines that average total commercial and non-commercial catch of the most recent three years exceeded the ACL after the fishing year is over and catch estimates are finalized, the Council would recommend that NMFS reduce the ACL in the subsequent fishing year by the amount of the overage. As shown in Table 3, annual catch of uku is highly variable. The reason for this inter-annual variability is unknown, though it could be due to factors such as catches of alternative species such as ahi or Deep 7, due to natural cycles of uku populations, or uncertainty in non-commercial catch estimates. To reduce the influence of inter-annual variability in evaluating fishery performance against ACLs, NMFS and the Council have used a moving three-year average (NMFS 2015), as permitted under implementing regulations and the Hawaii FEP (WPFMC and NMFS 2011). Additionally, if any fishery exceeds an ACL more than once in a four-year period, the Council is required to re-evaluate the ACL process for developing the ACL for that fishery and adjust the system as necessary to improve its performance and effectiveness in ensuring sustainability of the fishery. Figure 1 illustrates the relationship between the terms used in this section.

For more details on the specific elements of the mechanism and process for establishing ACLs and ACTs, see Amendment 3 to the Hawaii Archipelago FEP (WPFMC and NMFS 2011) and the final implementing regulations at 50 CFR 665.4 (76 FR 37286, June 27, 2011).

[3] Management uncertainty occurs because of the lack of sufficient information about catch (e.g., late reporting, under reporting, misreporting of landings, and uncertainty in in-season estimates of catch for non-commercial fisheries).

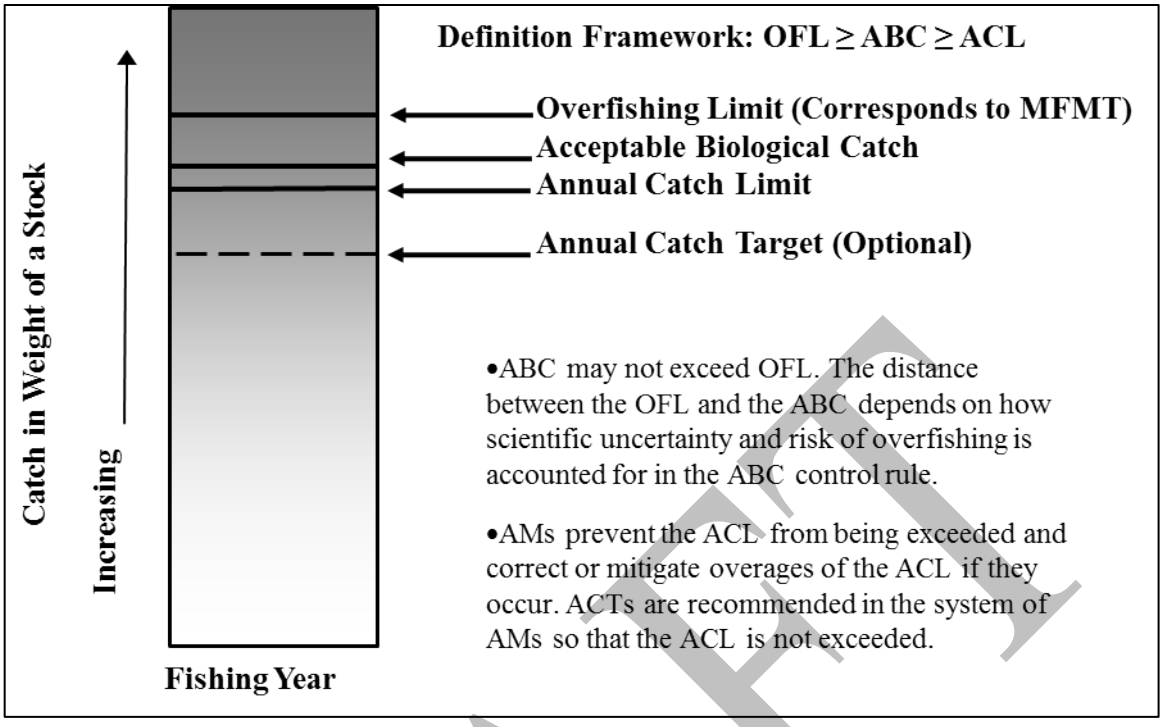

Figure 1. General relationship between OFL, ABC, ACL, and ACT

1.2 Proposed Action

The Council recommended, at the 186th meeting in June 2021, and the 187th meeting in September ACLs, ACTs and in-season and post-season AMs for the uku fishery that would apply to combined commercial and non-commercial catch in fishing years 2022, 2023,2024 and 2025. The current action therefore proposes management consistent with the timeframe of the Council recommendations: ACLs, ACTs, and both in-season and post-season AMs for 2022-2025.

NMFS will implement ACLs of 295,419 lb and ACTs of 291,010 lb for the uku fishery in the EEZ around the MHI each year for the fishing years 2022, 2023, 2024, and 2025, as recommended by the Council. The Council recommended the ACLs and ACTs based on the most recent benchmark stock assessment for the MHI uku (Nadon 2020), consistent with the Magnuson-Stevens Act and in accordance with the ACL process set forth in the Hawaii FEP. The stock assessment provided the risk of overfishing and catch associated with each level of risk.

Under the proposed action, in each of the four fishing years, NMFS and the Council would monitor the uku commercial and non-commercial catches from both State waters (generally from the shoreline to 3 nm offshore) and Federal waters around the MHI and evaluate catches against the ACTs in-season and the ACLs post season. Pursuant to Federal regulations at 50 CFR 665.4 (76 FR 37285, June 27, 2011), if an ACT is projected to be reached, NMFS would restrict fishing in Federal waters around the MHI to prevent the ACL from being exceeded. This in-season accountability measure is possible because fishery managers have access to monthly commercial fishery catch data and bi-monthly non-commercial catch estimates for uku. As a second AM, after the end of each fishing year (2022–2025), if NMFS and the Council determine that the average total commercial and non-commercial catch of uku from the previous three years exceeded the

ACL, NMFS and the Council would reduce the ACL in the subsequent fishing year by the amount of the overage as described in Section 1.1.1.

1.3 Purpose and Need for Action

The purpose of this action is to sustainably manage MHI uku fisheries in compliance with the requirements of the Magnuson-Stevens Act and the Hawaii FEP, requiring implementation of ACLs and AMs and optional implementation of ACTs. The need for this action is to maximize economic and social benefits of MHI uku fisheries while preventing overfishing and ensuring long-term sustainability of the MHI uku stock.

1.4 Action Area

The action area for this EA is where fishing for uku occurs in State and Federal waters of the MHI. Bottomfish fishing for uku occurs primarily in waters from the surface to 230 m deep from the Island of Hawaii to Niihau Island. Waters around islands northwest of Niihau are not part of the Action Area because commercial fishing is prohibited in Papahānaumokuākea Marine National Monument.

1.5 Decisions to be Made

After considering public comments on the proposed action and alternatives considered, NMFS will implement ACLs, ACTs, and in-season and post-season AMs for uku for the 2022, 2023, 2024, and 2025 fishing years. NMFS will use the information in this EA to consider the potential effects of the proposed action and alternatives on the affected environment(s) before taking final action. Finally, the Regional Administrator will use the information in this EA to make a determination about whether the selected ACLs, ACTs and AMs would be a major federal action with the potential to have a significant environmental impact, thus requiring the preparation of an environmental impact statement.

1.6 List of Preparers and Reviewers

Preparers:

Marlowe Sabater – Marine Ecosystem Scientist, Western Pacific Fishery Management
Lynn Rassel – Fishery Management Specialist, PIRO Sustainable Fisheries Division (SFD)
David OBrien – Fishery Management Specialist, PIRO SFD

Reviewers:

Phyllis Ha – Resource Management Specialist, PIRO SFD
Mark Fox – Fish and Wildlife Administrator, PIRO SFD
Ron Dean – Acting PIRO NEPA Coordinator

1.7 Public Involvement

The recommended ACLs and AMs were coordinated with the public by the Council at a number of public meetings. At its 183rd,186th, and 187th meetings held virtually from September 14-17, 2020,

June 22-24, 2021, and September 20-23rd, 2021, respectively, the Council considered and discussed issues relevant to uku ACLs, ACTs, and AMs, including the fishing level recommendations from the 137th, 140th, and 141st SSC meetings held virtually from September 9 – 10, 2020, June 15-17, 2021, and September 14-16, 2021, respectively. These meetings were open to the public and announced in the *Federal Register*, 85 FR 52091 (August 24, 2020) for the 183rd Council meeting, 86 FR 29251 (June 1, 2021) for the 186th Council meeting, 86 FR 47626 (August 26, 2021) for the 187th Council meeting, 85 FR 52091 (August 24, 2021), for the 137th SSC meeting, 86 FR 29251 (June 1, 2021) for the 140th SSC meeting, and 86 FR 47626 (August 26, 2021) for the 141th SSC meeting as well as on the Council's website. The Council made their uku ACL, ACT, and AM recommendations to NMFS at the conclusion of the 187th Council meeting. The Council can provide reports from these Council and SSC meetings. See Section 1.7.1 for a summary of the respective recommendations of the SSC and Council from these meetings.

On DATE, 2021, NMFS published a proposed rule with ACLs and AMs for uku, accompanied by a draft EA dated DATE, 2021 (## FR #####). NMFS requested public review and comments on the proposed rule and draft EA. The comment period ended DATE, 2021. NMFS received [number of comments] individual comments that were relevant to the rulemaking, and all generally supported the ACLs and AMs. NMFS considered public comments in finalizing the EA and in making its decision on the proposed action, and responds to the comments in the final rule. None of the comments resulted in a change to the rule or the analysis in the EA.

1.7.1 Council and SSC Meetings

The development of the Council's recommendations for uku ACLs, ACT's and AMs took place during public meetings of the SSC and the Council.

- 136th SSC (June 9–11, 2020) and 182nd Council (June 23–25, 2020) meeting held virtually in Honolulu, Hawaii – The SSC and Council received a presentation on the results of the WPSAR (85 FR 5633, January 31, 2020) from Chair, Dr. Erik Franklin, on the 2020 uku stock assessment (Nadon et al. 2020). The Chair presented the conclusions and recommendations of the WPSAR panel. At the same meetings, the SSC and Council also received a presentation on the final benchmark stock assessment as revised based on the WPSAR. The SSC determined the 2020 stock assessment to be BSIA. The Council recommended that the P* and SEEM working groups quantify uncertainties to set the Acceptable Biological Catch and specify the Annual Catch Limits (ACLs) for the MHI Uku fishery. The Council also directed staff to explore splitting the ACLs between the non-commercial and commercial fisheries to be monitored independently through the CML and HMRFS.

- 137th SSC (September 9-11, 2020) and 183rd Council (September 15-17, 2020) meeting held virtually in Honolulu, Hawaii – The SSC and Council received the presentation on the outcomes of the P* and SEEM working group evaluation of the scientific and management uncertainties. The SSC set the ABC at 43% risk of overfishing based on the P* analysis that resulted in a 7% reduction from the OFL to account for the scientific uncertainties. The Council had specified, as its preliminary preferred alternative, the ACL at 41% risk of overfishing and set the ACT at 36% risk of overfishing accounting for the social, economic, ecological, and management uncertainties. The Council also recommended that the Action

Team develop alternatives for accountability measures looking at in-season AMs for the commercial fisheries and a post-season adjustment if the ACL is breached.

- 186th Council meeting (June 22–24, 2021) held virtually in Honolulu, Hawaii (86 FR 29251, June 1, 2021) – The Council was given a presentation on options to monitor and manage the Hawaii uku fishery pertaining to the joint management of commercial and non-commercial sectors. The Council recommended an in-season AM that would track the combined commercial (from the monthly Fisher Reporting System, or FRS) and non-commercial catch (from the Marine Recreational Information Program, or MRIP) against the ACL and ACT. The Council requested that PIFSC develop a method that determined the data that the ACT would be projected using combined FRS and MRIP information, and also requested PIFSC conduct a Management Strategy Evaluation of the uku fishery to quantify the risk in managing the fishery jointly versus sector allocation and determine the effects of incongruent objectives between State and Federal management. Lastly, the Council requested the Hawaii Bottomfish Principals to work on uku management measures that are consistent with the management of Deep 7 bottomfish in Hawaii.

The SSC and the Council also deliberated and discussed alternatives for implementing an ABC, ACL, and ACT respectively. The SSC recommended using a P*=41% to determine ABC, which would be equivalent to 295,419 lb for the combined catch of commercial and non-commercial fisheries. This alternative utilized BSIA through a documented and transparent process incorporating the 2020 benchmark stock assessment and an improved P* process. The Council recommended setting the ACL equal to the ABC. The corresponding ACL would be 295,419 lb each year for fishing years 2022, 2023, 2024, and 2025. In addition, to address uncertainty in in-season non-commercial catch estimates, the SSC also recommended an ACT at P*=36% equivalent to 291,010 lb. This alternative, described below in Alternative 5, is the Council's preferred alternative. Further, the Council recommended an in-season AM to prevent the ACL from being exceeded: an in-season closure of Federal waters based on the projected date when the ACT would be reached for the uku fishery. As a second AM, the Council recommended that should an ACL be exceeded in a given year based on finalized estimates of commercial and non-commercial average catch from the previous three years, any overage will be applied in the subsequent fishing year.

1.7.2 NEPA Compliance

This Environmental Assessment (EA) is being prepared using the 2020 Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) Regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020, and reviews begun after this date are required to apply the 2020 regulations unless there is a clear and fundamental conflict with an applicable statute. 85 Fed. Reg. at 43372-73 (§§ 1506.13, 1507.3(a)). This EA began after August 2, 2021 and accordingly proceeds under the 2020 regulations.

On November 6, 2020, NOAA's Senior Agency Official, RDML Tim Gallaudet (Assistant Secretary of Commerce for Conservation and Management), granted a blanket waiver for time and page limits for a one-year period for all Environmental Assessments (EAs) and Environmental Impact Statement (EISs) developed to support fishery management actions that are: developed by the regional fishery management councils (Councils) pursuant to the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), or developed by the

National Marine Fisheries Service (NMFS) Atlantic Highly Migratory Species (HMS) Management Division for actions taken under the requirements of the MSA. Because this EA was prepared to support a Council fishery management action, the page and time limits defined in CEQ regulations are waived.

2 ALTERNATIVES CONSIDERED INCLUDING NO ACTION

2.1 Development of the Alternatives

NMFS and the Council managed the uku fishery from 2019 through 2021 only monitoring commercial catch relative to a commercial-only ACL. Prior to 2019, uku were managed as part of the non-Deep 7 bottomfish complex using an ACL that applied to a multi-species complex. This management cycle for 2022, 2023, 2024, and 2025, will be the first time uku management is based on combined commercial and non-commercial ACLs and ACTs.

To develop its ACL and ACT recommendation for the uku fishery for 2022 through 2025, the Council and its SSC used the approved process described in Section 1 and in detail in WPFMC and NMFS (2011). The process applied in this case started with a new stock assessment based on fisheries information and uku biology, which resulted in estimation of the OFL. The stock assessment was reviewed through WPSAR and again through the SSC to evaluate whether it contained information suitable for management. The next step was for a working group to assemble and review the scientific uncertainty within the stock assessment in order to make a recommendation for the P* (probability of overfishing). The SSC then applied the P* to recommend the ABC. The Council then specified the ACL based on the outcome of the SEEM analysis. Then, the Council considered ACTs, to account for uncertainty in the in-season estimates of non-commercial catch. The ACLs, ACTs, and AMs were used as the basis of the action alternatives considered here. The action alternatives under consideration are based upon the best available scientific, commercial and non-commercial catch, and other information about the uku fishery.

2.1.1 Estimation of OFL

The 2020 benchmark stock assessment (Nadon et al. 2020) provided the Council and NMFS with new scientific information about uku stock status, and with tables detailing the estimated risk of overfishing at various levels of catch (Table 1). Fisheries scientists from NMFS PIFSC compiled data from various information sources (i.e., life history information, catch data for the commercial and non-commercial fisheries, length data from catch and underwater census surveys, or UVS) to produce a stock assessment that describes the current status of uku. The assessment produced the combined commercial and non-commercial catch levels associated with various levels of overfishing risk at 1% intervals based on analysis of catch data and underwater census data (Table 1). The analysis assumes a fishery near equilibrium with relatively constant average fishing mortality and recruitment, so the risk of overfishing at a given level of catch does not change over time. For example, if catch is equivalent to the OFL each year, the risk of overfishing would remain 50% indefinitely. If an amount less than the OFL was caught in one or more years, the actual risk of overfishing would be less than 50% the next year, providing an additional qualitative buffer against overfishing. The assessment determined that the equilibrium assumption was met for uku, and that the stock was not overfished and not experiencing overfishing.

The new benchmark stock assessment underwent peer review by a WPSAR panel from February 24 to 28, 2020 (85 FR 5633, January 31, 2020) in accordance with the requirements of National Standard 2 (78 FR 43066, July 19, 2013). Dr. Erik Franklin (chair), Dr. Yong Chen, and Dr. Yan Jiao conducted the review. Pursuant to this review, PIFSC incorporated the short-term recommendations of the WPSAR panel and produced the final assessment (Nadon et al. 2020). At its 136th meeting, the SSC heard the results of the WPSAR review and final stock assessment. As described in the 136th SSC meeting report, the SSC found the 2020 stock assessment to represent BSIA for development of harvest limits and overfishing status determination for uku. Similarly, on August 31, 2020, PIFSC also determined that the assessment was BSIA.

Table 1. Probability of overfishing uku for various catch levels converted to pounds (Nadon et al. 2020).

P*	2020	2021	2022	2023	2024	2025	2026
0.5	339,511	326,284	317,465	310,851	306,442	302,033	297,624
0.49	337,307	326,284	317,465	310,851	306,442	302,033	297,624
0.48	337,307	324,079	317,465	310,851	304,238	299,828	297,624
0.47	335,102	324,079	315,261	308,647	304,238	299,828	295,419
0.46	335,102	321,875	315,261	308,647	304,238	299,828	295,419
0.45	332,898	321,875	313,056	306,442	302,033	297,624	295,419
0.44	332,898	319,670	313,056	306,442	302,033	297,624	293,214
0.43	332,898	319,670	313,056	306,442	299,828	**297,624**	293,214
0.42	330,693	319,670	310,851	304,238	299,828	295,419	293,214
0.41	330,693	317,465	310,851	304,238	299,828	**295,419**	291,010
0.4	328,488	317,465	308,647	304,238	297,624	293,214	291,010
0.39	328,488	315,261	308,647	302,033	297,624	293,214	291,010
0.38	326,284	315,261	308,647	302,033	297,624	293,214	288,805
0.37	326,284	315,261	306,442	299,828	295,419	291,010	288,805
0.36	326,284	313,056	306,442	299,828	295,419	**291,010**	288,805
0.35	324,079	313,056	304,238	299,828	295,419	291,010	286,601
0.34	324,079	310,851	304,238	297,624	293,214	288,805	286,601
0.33	321,875	310,851	304,238	297,624	293,214	288,805	286,601
0.32	321,875	310,851	302,033	297,624	291,010	288,805	284,396
0.31	319,670	308,647	302,033	295,419	291,010	**286,601**	284,396
0.3	319,670	308,647	299,828	295,419	291,010	286,601	282,191
0.29	319,670	306,442	299,828	293,214	288,805	284,396	282,191
0.28	317,465	306,442	297,624	293,214	288,805	284,396	282,191
0.27	317,465	304,238	297,624	291,010	286,601	284,396	279,987
0.26	315,261	304,238	297,624	291,010	286,601	**282,191**	279,987
0.25	315,261	302,033	295,419	291,010	284,396	282,191	277,782
0.24	313,056	302,033	295,419	288,805	284,396	279,987	277,782
0.23	313,056	299,828	293,214	288,805	284,396	279,987	277,782

0.22	310,851	299,828	293,214	286,601	282,191	279,987	275,578
0.21	308,647	297,624	291,010	286,601	282,191	277,782	275,578
0.2	306,442	297,624	291,010	284,396	279,987	277,782	273,373

2.1.2 Calculation of ABC

According to the established ACL process, the ABC is the acceptable level of catch that accounts for the scientific uncertainty of the information used in the assessment. In essence, the OFL is reduced to account for uncertainty, and the result is the ABC (Figure 1). The computation of the ABC used in the proposed alternatives followed the previously approved process described in the Hawaii FEP. The calculation of ABC begins with a P* working group that systematically addresses scientific uncertainty in the stock assessment. The P* process evaluates four aspects of the stock assessment: assessment information, assessment uncertainty, stock status, and stock productivity and susceptibility to fishing. The working group gives a score of 0–10 to each aspect, where a higher score indicates greater uncertainty. These scores are summed and subtracted from 50 to calculate P*.

The Council, at its 182nd meeting, directed staff to convene the P* working group to quantify the scientific uncertainties in the new assessment, and to provide their recommendations for the SSC to consider in developing the ABC. This group met virtually on July 21, 2020. The working group quantified the following reduction scores for each of the four dimensions: 0.7 for assessment information, 2.5 for uncertainty characterization, 0.0 for stock status, and 4.2 for productivity and susceptibility. P* was reduced for assessment information because of the variations in the catch history coming from the non-commercial fisheries through HMRFS. Additional reductions came from the absence of tagging data and spatial analysis. Uncertainty dimension received a reduction score of 2.5 because of the limited availability in reproduction and environmental information in the stock assessment. This allows for further improvement in the model. No reductions were made for stock status because the stock is healthy. The score for productivity and susceptibility was 4.2 because uku are a high trophic level species and are moderately susceptible to capture. The scoring also reflects the susceptibility between the commercial and non-commercial fisheries noting the two fisheries are vastly different in terms of fishing, targeting, and participation. In total, the P* analysis indicated that overfishing risk should be reduced to 43%.

The report from the P* meeting will be presented at the SSC and Council at their 137th and 183rd meetings, respectively and will enable the SSC and Council to use the information for the Council's recommendation on ABC, ACL and AMs. The P* scores will be the basis for the SSC recommending an ABC associated with a risk of overfishing levels of 43% or lower in fishing year 2022-2025 (rather than on the highest acceptable limit of 50% risk of overfishing).

The Council specified the ACL based on the SEEM working group analysis that met on July 21, 2020 where a 2% reduction is required to account for uncertainties from the social, economic, and ecological dimension therefore the ACL can be specified at 41% risk. More so, the working group also quantified the monitoring and management uncertainties amounting to a reduction 5% resulting in an ACT at 36% of overfishing. Following the P* and SEEM approach, the ACL is at 134 mt (295,419 pounds) and the ACT is at 132 mt (291,010 pounds).

2.2 Description of the Alternatives

This section describes a range of ACL, ACT and AM alternatives for the uku fishery in fishing years 2022 through 2025 and expected fishery outcomes. Table 2 summarizes the alternatives considered, including their associated probability of overfishing (P*) based on the risk table from the 2020 benchmark stock assessment (Table 2). In accordance with National Standard 1 guidelines of the Magnuson-Stevens Act, the probability of overfishing cannot exceed 50% and should be a lower value (74 FR 3178, January 9, 2011). Alternative 5 is the NMFS preferred alternative as recommended by the Council.

Table 2. Summary of alternatives and associated probabilities of overfishing (P*) values (in percent) for uku.

Alternatives	***ACL (lb)***	***P* (ACL)***	***ACT (lb)***	***P* (ACT)***	***In-season AM***	***Post-season AM***
Alternative 1: No Action; no management action. No AMs required.	No ACL	NA	NA	NA	NA	NA
Alternative 2: No action; status quo/ baseline. Continue previous (2019-2020) management. Used 2016 benchmark assessment and previous P* analysis to set a commercial-only ACL. In-season AM: closure to fishing in Federal waters if commercial catch expected to reach ACL. Post-season AM: ACL overage adjustment, relative to three-year average total catch.	127,205	42	NA	NA	Yes	Yes

Alternatives	*ACL (lb)*	*P* (ACL)*	*ACT (lb)*	*P* (ACT)*	*In-season AM*	*Post-season AM*
Alternative 3: Use 2020 benchmark assessment and P* analysis to set ACL for combined commercial and non-commercial fishery catch. Post-season AM: ACL overage adjustment, relative to three-year average total catch.	295,419	41	NA	NA	No	Yes
Alternative 4: Use 2020 benchmark assessment and P* analysis to set ACL for combined commercial and non-commercial fishery catch. In-season AM: close Federal waters when ACL reached. Post-season AM: ACL overage adjustment, relative to three-year average total catch.	295,419	41	NA	NA	Yes	Yes

Alternatives	*ACL (lb)*	*P* (ACL)*	*ACT (lb)*	*P* (ACT)*	*In-season AM*	*Post-season AM*
Alternative 5: ***Preferred Alternative*** Use 2020 benchmark assessment and P* analysis to set ACL and ACT for combined commercial and non-commercial fishery catch. In-season AM: close Federal waters when ACT reached. Post-season AM: ACL overage adjustment, relative to three-year average total catch.	295,419	41	291,010	36	Yes	Yes
Alternative 6: Use 2020 benchmark assessment and P* analysis to set ACL and ACT for combined commercial and non-commercial fishery catch. In-season AM: close Federal waters when ACL reached. Post-season AM: ACL overage adjustment, relative to three-year average total catch.	286,601	31	282,191	26	Yes	Yes

2.2.1 Alternative 1: no action; no management.

Under Alternative 1, NMFS would not implement an ACL or AMs for the uku fishery for fishing years 2022, 2023, 2024, and 2025. The fishery would be unconstrained in terms of catch limits but would continue to be subject to other fishery management requirements such as state size limits and license requirements to sell fish.

This alternative would not be consistent with the Magnuson-Stevens Act requirements or the provisions of the Hawaii FEP, which require NMFS to implement an ACL and AMs for all MUS stocks and stock complexes in order to ensure that overfishing does not occur.

Expected Fishery Outcome

Under this alternative, the MHI uku fishery would fish year-round. NMFS would not implement an ACL and there would not be regulatory discards of uku due to a fishery closure.

Under Alternative 1, we expect the fishery would continue in the manner in which it has operated in recent years. Not implementing an ACL or AMs is not expected to result in large changes to the conduct of the fishery, including gear types used, areas fished, level of catch or effort, target and non-target stocks, or protected species.

Table 3 shows the annual commercial and non-commercial catch of uku since 2010. Over this period, commercial catch peaked in 2017, and non-commercial peaked in 2012. Commercial catches (average 102,784 lb, standard deviation 24,560) are on average slightly less than non-commercial catches (average 118,408, standard deviation 56,684) but are less variable. Reasons for this difference in catch variability across commercial and non-commercial fishery are not known, though uku is often considered to be a "pulse" fishery and catch and effort in the uku fishery have historically varied based on weather and influences of fishing conditions in other local fisheries (e.g., ahi and Deep 7).

Since ACLs were first implemented for the non-Deep 7 stock complex in 2012, combined commercial and non-commercial catch (Table 3) have exceeded the OFL from the 2020 stock assessment (297,624 lb) once in 2012. In fishing years 2022, 2023, 2024, and 2025, without an ACL, the total commercial and non-commercial uku catch (Table 3) is expected to be within the range of catches in recent years, and is not expected to exceed the OFL. Under Alternative 1, if the combined catch of both fisheries were equivalent or exceeded the total catch observed in 2012 (Table 3), the lack of an ACL and AMs under Alternative 1 would not provide regulatory ability to ensure the long-term sustainability of the resource.

Table 3. Annual commercial, non-commercial, total, and three-year average fishery catch of uku (lb) from 2010 to 2020.

Year	Commercial catch	Non-commercial catch	Total catch	3-yr average total catch
2010	120,857	99,649	220,506	NA
2011	109,371	129,191	238,562	NA
2012	116,889	206,793	323,682	260,917
2013	121,122	59,304	180,426	247,557
2014	96,893	105,601	202,494	235,534
2015	101,920	72,091	174,011	185,644
2016	119,226	59,084	178,310	184,938
2017	131,947	129,191	261,137	204,486
2018	74,648	199,959	274,607	238,018

2019	89,836	58,559	148,395	228,047
2020	47,912	183,065	230,977	217,993

In summary, under Alternative 1, the commercial and non-commercial MHI uku fisheries would not be constrained by an ACL or an AM such as an in-season closure. The fishery would be subject to other state conservation and management measures such as the size limit for commercial sale, requirements for commercial fishing license, and reporting requirements. The Council and NMFS would continue to monitor commercial and non-commercial catches on a periodic basis. Without an ACL or AMs, the MHI uku fisheries are expected to fish in the same way they have fished in recent years with respect to effort, participation, intensity, and areas fished. If catches are similar to their recent peak (2012), fishing may exceed levels that take into account scientific uncertainty to ensure a low risk of overfishing and the long-term sustainability of the resource; however, we would not expect this outcome, given the average total catch in recent years (2020 3-yr average catch = 217,993 lb).

2.2.2 Alternative 2: no action; status quo/baseline.

Under Alternative 2, the status quo alternative, NMFS would continue MHI uku management following recommendations for 2019-2021, the most recent management regime. Alternative 2 would continue a commercial-only ACL of 127,205 lb for each year from 2022 through 2025. The ACL in this alternative is based on the 2016 assessment (Nadon 2017), and SSC and Council deliberations through 2016 and 2017, with a P* of 42% (NMFS 2019a).

As an in-season AM to prevent the fishery from exceeding the ACL, under this status quo alternative, NMFS would close the commercial and non-commercial fishery in Federal waters for the remainder of the fishing year if NMFS projects that commercial catch will reach the ACL.

A second, post-season AM would be implemented under Alternative 2 for fishing years 2022–2025. NMFS would implement an overage adjustment in the subsequent fishing year if it determines, based on commercial fish reports, that the average commercial catch from the most recent three years exceeded the ACL. If this occurred, the commercial-only ACL for the following year would be reduced by an amount equal to the overage.

This alternative is more precautionary than the Alternative 1, no management, and it complies with some requirements of the Magnuson-Stevens Act and the Hawaii FEP and implementing regulations, which require implementation of an ACL and AMs for MHI uku. Alternative 2 fails to consider the most recent 2020 benchmark uku assessment (Nadon et al. 2020), and it is thus not compliant with Magnuson-Stevens Act National Standard 2, requiring management to be based on the best scientific information available.

Expected Fishery Outcome

Under Alternative 2, the commercial MHI uku fishery would be limited to a catch of up to 127,205 lb of uku per year. The commercial fishery may reach this ACL if fishery performance is similar to recent years (Table 3), but this is expected to occur infrequently and, if so, only near the end of the year. Since ACLs were first implemented for the non-Deep 7 fishery in 2012, commercial uku

catch reached the ACL proposed under Alternative 2 once, in 2017. Uku catch would have only exceeded a commercial-only ACL of 127,205 lb in December of that year (Table 4).

Table 4. Cumulative commercial catch of MHI uku (lb) by year and month, 2011-2020.
Source: DAR data request

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	5,249	14,926	19,428	36,706	50,271	64,805	75,414	84,378	93,939	100,165	104,158	109,461
2012	12,175	20,136	24,571	33,496	44,202	57,287	68,614	79,377	91,741	102,594	108,479	116,366
2013	11,099	15,529	24,362	40,552	66,729	79,662	85,724	94,750	102,527	110,899	116,152	121,492
2014	6,750	12,051	18,215	23,628	39,963	49,240	52,458	58,183	71,129	76,939	84,417	96,987
2015	13,190	21,839	29,419	34,996	47,663	65,068	73,063	80,704	87,503	91,661	95,307	101,895
2016	11,869	17,755	22,961	31,417	57,323	73,354	82,466	98,207	103,739	106,966	112,463	118,622
2017	11,439	18,516	28,722	46,171	58,765	73,808	86,432	99,585	112,447	120,639	123,702	132,709
2018	11,531	19,047	25,339	28,283	34,195	45,170	53,770	57,136	62,256	66,736	71,821	75,333
2019	5,593	8,783	11,587	16,918	37,711	50,744	57,801	64,692	70,833	77,653	84,262	90,017
2020	4,126	8,476	12,603	15,658	19,161	24,148	28,361	30,495	34,342	39,751	41,299	47,932

If the commercial fishery were to attain the ACL of 127,205 lb under Alternative 2 during 2022-2025, NMFS would implement a closure of the commercial and non-commercial fisheries for uku in Federal waters as an AM. In-season fishery closure is expected to keep commercial reported catch of uku below the ACL and OFL and prevent overfishing, based on the 2016 stock assessment (Nadon 2017).

If the fishery were closed before the end of the fishing year, fishermen could continue to catch uku in State waters, since there would not be a corresponding closure of State waters for uku. However, approximately 66% of commercial uku catch comes from Federal waters (Harvey and Associates 2017), so closure of Federal waters would significantly reduce commercial uku catch. If the fishery is closed, NMFS estimates that under normally encountered effort and catch, it would likely be closed late in the year. NMFS expects that fishermen would continue to fish for pelagic fish and other bottomfish in the same way as they already are fishing for these MUS, and any uku caught incidental to these other fisheries within Federal waters would be discarded. Uku commercial catch from State waters during a Federal fishery closure could be sold and all fish reported would be counted toward an ACL exceedance, if applicable.

Under Alternative 2 and after each fishing year ends, NMFS and the Council would review catch reports from State and Federal waters to determine whether the fishery had actually attained the commercial-only ACL. If the three-year average catch were to exceed the ACL in any fishing year, NMFS would reduce the ACL in the next fishing year by the amount of the overage. However, based on recent fishing performance over the last ten years and with the in-season accountability measure, it is not expected that the fishery would change such that the commercial-only ACL of 127,205 lb would be exceeded and an overage adjustment be needed (Table 5).

Table 5. Annual commercial and three-year average commercial fishery catch of uku (lb) from 2010 to 2020.

Year	Commercial catch	3-yr average commercial catch
2010	120,857	NA
2011	109,371	NA
2012	116,889	115,706
2013	121,122	115,794
2014	96,893	111,635
2015	101,920	106,645
2016	119,226	106,013
2017	131,947	117,697
2018	74,648	108,607
2019	89,836	98,810
2020	47,912	70,799

In summary, under Alternative 2, the commercial uku fishery may be constrained by the ACL if it fishes as it did in 2017, although it only exceeded the Alternative 2 ACL once in 11 years (Table 5), so NMFS expects that in most years the fishery would not reach the proposed ACL in most years. If the fishery did close under the in-season AM, it would likely be near the end of the fishing year and have limited impact on fishing activity in either the commercial or non-commercial fishery. The fishery is therefore not expected to change the way it fishes with respect to fishing gear, fishing effort, participation, or intensity. Based on three-year running averages of commercial catch, the uku fishery has not exceeded the proposed ACL in the past 10 years, so an overage adjustment under the post-season AM is unlikely. Should the fishery have an exceptional harvest year and the running three-year average exceed the ACL, the Council and NMFS would implement an overage adjustment in the ACL in the following year.

2.2.3 Alternative 3: combined commercial and non-commercial fishery ACL of 295,419 lb with a post-season AM.

Under Alternative 3, NMFS would implement an ACL of 295,419 lb (134 mt) for uku in the MHI each year for 2022, 2023, 2024, and 2025. This alternative corresponds to a risk of overfishing (P*) of 41% in the 2020 stock assessment (Nadon et al. 2020). The important difference between this alternative and those presented previously is that Alternative 3 explicitly considers the catches in the non-commercial fishery, consistent with the management reference points developed in the 2020 stock assessment (Nadon et al. 2020). We will refer to combined commercial and non-commercial catch estimates as total catch estimates.

Alternative 3 includes a post-season AM but no in-season AM. After each fishing year ends, NMFS and the Council would review the total catch, averaged over the most recent three years, with the ACL and implement an overage adjustment if needed. In the last eleven years (2010 – 2020), the three year average total catch (Table 3) has not exceeded the ACL defined in Alternative 3 and we do not expect that this ACL would be exceeded over the 2022–2025 period. NMFS and

Council would develop total catch estimates by combining catch information collected by the State of Hawaii for the commercial fishery (Commercial Fishing Reports) and non-commercial fishery (Hawaii Marine Recreational Fishing Survey, HMFRS, via NMFS's MRIP). Commercial catch estimates are available about one month after fishing year ends while non-commercial catch estimates are available about three months after the end of the fishing year. This post-season AM would be evaluated shortly after annual non-commercial catch estimates were available. If an ACL overage adjustment was required, this timing, about three months after the end of a fishing year, would not limit the ability to modify the ACL for the fishing year already underway.

The ACL under Alternative 3 is not comparable to the ACL associated with Alternative 2 as the Alternative 3 ACL was developed from the 2020 stock assessment (Nadon et al. 2020) while the Alternative 2 ACL was from the 2016 stock assessment (Nadon 2017). Because Alternative 3 explicitly accounts for the non-commercial fishery, which on average catches more uku annually than the commercial fishery (Table 3), this is a more appropriate approach to management than either Alternatives 1 or 2 and is consistent with all requirements of the Magnuson-Stevens Act and the Hawaii FEP and implementing regulations, which require implementation of an ACL and AMs for MHI uku.

Expected Fishery Outcome

Under Alternative 3, the combined commercial and non-commercial fishery catches would only be addressed relative to the ACL of 295,419 lb of uku per year post-season, precluding the possibility of in-season fishery closures. The total catch of uku averaged over three years is compared to the ACL in this alternative. From 2010 to 2020, the three-year average total catch of uku has never reached the ACL specified by Alternative 3 (Table 3). Should the three-year average total catch in the fishery exceed the Alternative 3 ACL post-season, the Council would recommend and NMFS would implement an overage adjustment. This post-season AM provides a management framework to ensure the fishery continues to be sustainable. Any overage adjustment would likely be applied in the year immediately following the overage year because the Council would have time to evaluate catch data, and NMFS would have time to implement the adjusted ACL prior to the end of the fishing year. Considering recent catch history, we anticipate that it is very unlikely that an overage adjustment would be needed (Table 3) in the 2022–2025 management period, as no recent three year average total uku catch has been greater than 261,000 lb and has been nearly 35,000 lb less than the Alternative 3 ACL. If the post-season AM was achieved, requiring three or more years of total catches higher than we have observed in the past 11 years, we also anticipate that the overage would be only a small amount.

In summary, under Alternative 3, uku fishery management would explicitly consider both the commercial and non-commercial fishery, consistent with management reference points developed in the most recent stock assessment (Nadon et al. 2020). Alternative 3 would compare post-season, the three-year average total catch, or combined commercial and non-commercial catch, to the ACL, with ACL overages addressed with an overage adjustment in the following fishing year. No recent three-year average total MHI uku catch has been close to exceeding the 295,419 lb ACL under Alternative 3, and we do not anticipate it to happen during the 2022–2025 fishing years.

2.2.4 Alternative 4: combined commercial and non-commercial ACL of 295,419 lb with both in-season and post-season AM.

Under Alternative 4, NMFS would implement an ACL of 295,419 lb (134 mt) for uku in the MHI each year for 2022, 2023, 2024, and 2025. This ACL corresponds to a risk of overfishing (P*) of 41% in the 2020 stock assessment (Nadon et al. 2020). This alternative differs from Alternative 3 only in that it includes both in-season and post season AMs.

An in-season AM for both commercial and non-commercial catch requires NMFS and Council to monitor catches from both fisheries through the fishing season and project when the total catch combined across those two fisheries would reach the Alternative 4 ACL. NMFS and Council would develop in-season total catch estimates by combining catch information collected by the State of Hawaii for the commercial fishery (Commercial Fishing Reports) and non-commercial fishery (HMRFS via NMFS's MRIP). Commercial fishing reports are compiled by the State of Hawaii on a monthly schedule and catch totals from commercial reports are available roughly 5-10 days after each month's fishing is completed. Non-commercial catch is estimated in six two-month waves through each year, available two weeks after the end of each wave. Non-commercial catch estimates for the previous two month period would be available approximately mid-March for January and February, mid-May for March and April, mid-July for May and June, etc. For projecting when total in-season catch will reach the ACL, NMFS will assume total non-commercial wave catches were split evenly across each month within the wave. NMFS will project total annual catch in-season by adding estimates of future monthly catches to the current known cumulative catch. Estimates of future catch would be based on average catches observed for those months during the previous three years for commercial and non-commercial catch, using similar methods to those used for projecting catch in the Deep 7 bottomfish and bigeye tuna fisheries. As an in-season AM, NMFS would close Federal waters to uku retention for the remainder of the fishing year through a *Federal Register* notice when the combined commercial and non-commercial catch are projected to reach the Alternative 4 ACL. Uku fishing would not close in State waters even after Federal waters were closed, and uku caught commercially in State waters could be sold.

After each fishing year ends, NMFS and the Council would review the total catch, averaged over the most recent three years, with the ACL and implement an overage adjustment if needed. In the last eleven years (2010–2020), the three year average total catch (Table 3) has not exceeded the ACL defined in Alternative 4 and we do not expect that the ACL would be exceeded post-season over the 2022–2025 management period. NMFS and Council would develop total catch estimates by combining post-season catch information as described previously for Alternative 3.

The ACL under Alternative 4 is the same as the ACL under Alternative 3 as they were both developed from the most up to date stock assessment (Nadon et al. 2020), while the Alternative 2 ACL was from the 2016 stock assessment (Nadon 2017). Like Alternative 3, Alternative 4 is consistent with all requirements of the Magnuson-Stevens Act and the Hawaii FEP and implementing regulations, which require implementation of an ACL and AMs for MHI uku. Alternative 4 is more conservative than Alternative 3, as the implementation of an in-season AM means exceeding the ACL is less likely.

<u>Expected Fishery Outcome</u>

Under Alternative 4, the combined commercial and non-commercial fishery catches would be monitored relative to the ACL of 295,419 lb of uku per year both in-season and post-season, with the possibility of in-season fishery closures in Federal waters if the ACL is projected to be reached and ACL overage adjustments post season.

We expect the Alternative 4 in-season AM will only occasionally result in closure of Federal waters. In the eleven years from 2010 through 2020 (Table 3), the combined commercial and non-commercial uku catch exceeded the proposed ACL of once in 2012 when total uku catch was 323,682 lb. This one in 11 exceedance suggests that there is roughly a one in three chance that the ACL will be reached in-season one or more times in the 2022-2025 management period. An intuitive way to calculate this probability is to consider its inverse, the probability that the ACL will not be reached in-season, and then invert it to calculate the probability we're interested in. Ten of 11 years of past total catch history did not achieve the proposed ACL under Alternative 4, or 90.9%. If we assume that each fishing year in the upcoming management period are independent events, or trials, with this probability, then the probability of not exceeding the ACL in any of 2022, 2023, 2024 or 2025 equals 0.909 multiplied together four times (0.909 4), or 0.683. If the probability of not exceeding the ACL over the next four years is 68.3%, then one minus that probability is the probability that the ACL will be exceeded at least once over the same time period (1-0.683), or 0.317. This probability, 31.7%, is very close to a one in three chance, or 33.3%, and so we rounded up to simplify our estimate of how likely that the ACL would be exceeded in-season over the 2022-2025 management period under Alternative 4.

The patterns of cumulative total uku catch through time since 2010 (Figure 2) suggest that if an in-season closure occurred, it would be near the end of the fishing year and would therefore have relatively little impact to operation of either the non-commercial or commercial fishery. However, approximately 66% of commercial uku catch comes from Federal waters (Harvey and Associates 2017), so closure of Federal waters would reduce commercial uku catch after the closure. NMFS expects that fishermen would continue to fish for pelagic fish and other bottomfish in the same way as they already are fishing for these MUS, and any uku caught incidental to these other fisheries within Federal waters would be discarded. Uku commercial catch from State waters during a Federal fishery closure could be sold and all fish reported would be counted toward an ACL exceedance post-season, if applicable.

The total catch of uku averaged over three years would be compared to the ACL post-season under Alterative 4. As described for Alternative 3, from 2010 to 2020, the three-year average total catch of uku has never reached the ACL (Table 3) and we anticipate that it is very unlikely that an overage adjustment would be needed in the 2022–2025 management period. Should the three-year average total catch in the fishery exceed the Alternative 4 ACL post-season, the Council would recommend and NMFS would implement an overage adjustment.

In summary, under Alternative 4, uku fishery management would explicitly consider both the commercial and non-commercial fishery, consistent with management reference points developed in the most recent assessment (Nadon et al. 2020). Alternative 4 would implement both in-season and post-season AMs. We anticipate that there is roughly a one in three chance that in-season total catch would be projected to reach the ACL in one or more years during the 2022-2025 management period, resulting in closure of Federal waters to uku retention for the remainder of that year. We do not anticipate that the three-year average total uku catch would exceed the ACL over

the 2022–2025 period, requiring an ACL overage adjustment post-season. If the fishery were closed before the end of the fishing year, fishermen could continue to catch uku in State waters, since there would not be a corresponding closure of State waters for uku. We anticipate that an in-season closure, if it occurred, would happen relatively late in the fishing season, and have small impacts to fishing activities of the commercial and non-commercial fishery, mostly due to the availability of other species to target during the uku closure.

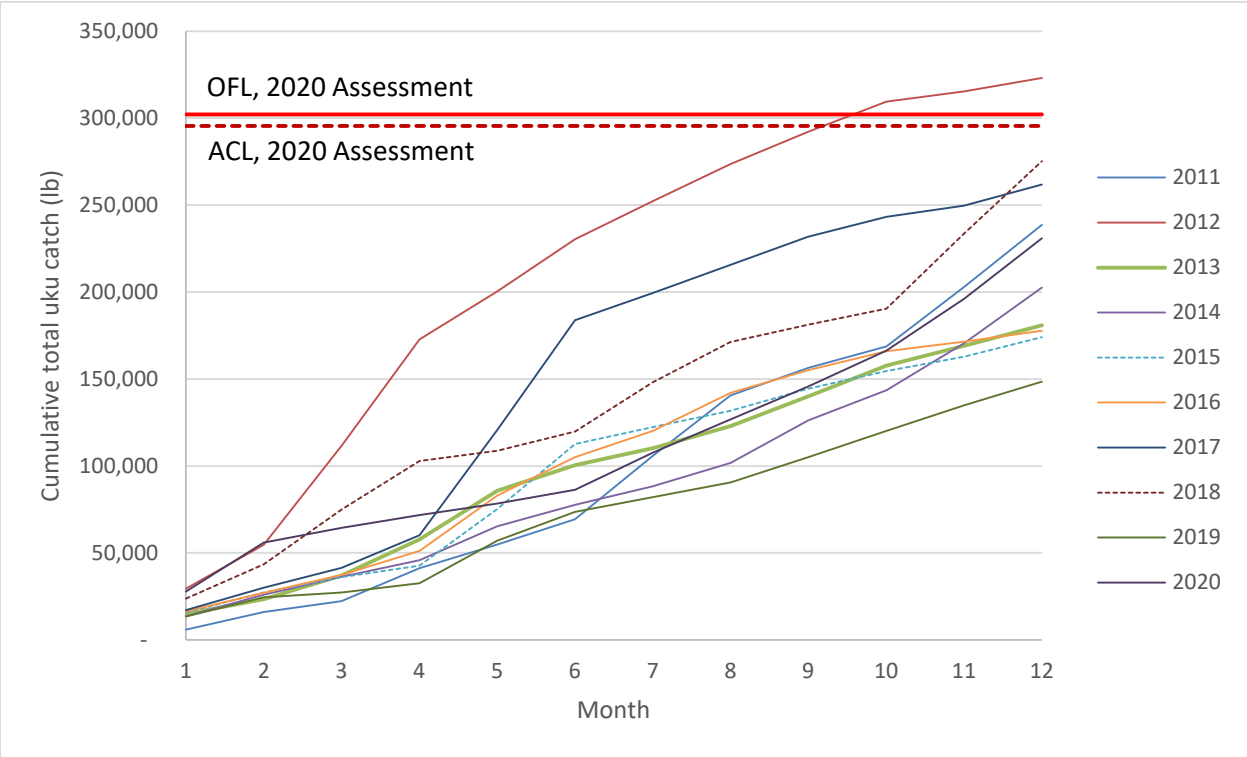

Figure 2. Cumulative monthly combined commercial landings and estimated non-commercial catch ('total catch') of uku in recent years relative to the ACL (295,419 lb) and OFL (302,033) under Alternative 4.

2.2.5 Alternative 5: (*Preferred alternative*) combined commercial and non-commercial ACL of 295,419 lb, ACT of 291,010 lb, with both in-season and post-season AMs.

Alternative 5 is the same as Alternative 4, except for the definition of an ACT. This ACT, set at 291,010 lb, is the catch at a P* level of 36% based on the most recent stock assessment (Nadon et al. 2020). This ACT would be the catch level associated with the in-season AM under Alternative 5 and is intended to reduce the likelihood of exceeding the ACL with an in-season AM based on the ACL alone. The ACL under Alternative 5 would be 295,419 lb, consistent with P* of 41%, for years 2022, 2023, 2024, and 2025. Both in-season and post season AMs are proposed under Alternative 5, the preferred alternative.

An ACT was recommended by Council to address uncertainty in the in-season estimates of non-commercial catch and reduce the likelihood of exceeding the ACL given those uncertainties. Percent standard error (PSE), a measure of precision of an estimate, are published for all non-

commercial catch estimate waves (Table 6) by NOAA on the MRIP website[4]. PSE less than 30 is considered reasonable and suitable for management purposes. Over the last three years (2018-2020), the average PSE for wave estimates of non-commercial uku catch is 55.7 (range 37.0 to 100.2), indicating that in-season wave estimates are quite imprecise. Precision in the overall annual estimates of non-commercial catch is better, with an average PSE of 25.8 (range 23.4 to 28.4) over the same three year period.

Table 6. Percent standard error, a measure of precision, for non-commercial uku catch estimates by estimate wave, 2018-2020. Percent standard errors less than 30 are considered reasonable for management purposes.

Wave	Months	Year		
		2018	2019	2020
1	Jan/Feb	58.2	54.3	74.1
2	Mar/Apr	46.3	n/a	51.8
3	May/Jun	n/a	52.9	49.1
4	Jul/Aug	42.6	100.2	56.5
5	Sep/Oct	72.2	45.3	37.0
6	Nov/Dec	44.0	69.1	37.9

The in-season AM for Alternative 5 would use the same methods as described for Alternative 4, except that in-season total uku catch would be compared to the ACT (291,010 lb) as opposed to the ACL. The ACL under Alternative 5 is the same as the ACL under Alternative 3 and 4 and is based on the 2020 stock assessment (Nadon et al. 2020). Like Alternatives 3 and 4, Alternative 5 is consistent with all requirements of the Magnuson-Stevens Act and the Hawaii FEP and implementing regulations. Alternative 5 is more conservative than Alternative 4, as the implementation of an in-season AM using an ACT lower than the ACL further lowers the likelihood of an ACL overage. An ACT was specified for Alternative 5 primarily in recognition of the relative uncertainty in non-commercial catch estimates in-season.

Expected Fishery Outcome

Under Alternative 5, the combined commercial and non-commercial fishery catches would be monitored relative to the ACT of 291,010 lb of uku in-season and ACL of 295,419 lb of uku post-season, with the possibility of in-season fishery closures in Federal waters if the ACT is projected to be reached and ACL overage adjustments post-season following the methods described for previous alternatives.

We expect the Alternative 5 in-season AM will only occasionally result in closure of Federal waters. In the eleven years from 2010 through 2020 (Table 3), the combined commercial and non-commercial uku catch exceeded the proposed ACT of 291,010 lb once in 2012 when total uku

[4] https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries

catch was 323,682 lb (Figure 2). Similar to Alternative 4, there is roughly a one in three chance that the ACT will be reached in-season one or more times in the 2022-2025 management periods under Alternative 5, resulting in in-season closure of Federal waters. As described for Alternative 4, we anticipate that the implications for commercial and non-commercial fisheries of an in-season closure under Alternative 5 would be relatively small.

The total catch of uku averaged over three years would be compared to the ACL post-season under Alterative 5. As described for Alternative 3 and 4, from 2010 to 2020, the three-year average total catch of uku has never reached the ACL (Table 3) and we anticipate that it is very unlikely that an overage adjustment would be needed in the 2022–2025 management period. Should the three-year average total catch in the fishery exceed the Alternative 5 ACL post-season, the Council would recommend and NMFS would implement an overage adjustment.

In summary, under Alternative 5, uku fishery management would explicitly consider both the commercial and non-commercial fishery, consistent with management reference points developed in the most recent assessment (Nadon et al. 2020) and consistent with all requirements of the Magnuson-Stevens Act and the Hawaii FEP and implementing regulations. Alternative 5 would implement both in-season and post-season AMs. We anticipate an approximately one in three chance that Alternative 5 ACT would be reached in-season in one or more years during the 2022–2025 management period, resulting in closure of Federal waters to uku retention for the remainder of the year. We do not anticipate that the three-year average total uku catch would exceed the ACL over the 2022–2025 period, requiring an ACL overage adjustment post-season. If the fishery were closed before the end of the fishing year, fishermen could continue to catch uku in State waters, since there would not be a corresponding closure of State waters for uku. We anticipate that an in-season closure, if it occurred, would happen relatively late in the fishing season, and have small impacts to fishing activities of the commercial and non-commercial fishery, mostly due to the availability of other species for those fisheries to target during the uku fishery closure.

2.2.6 Alternative 6: combined commercial and non-commercial ACL of 286,601 lb, ACT of 282,192 lb, with both in-season and post-season AM.

Alternative 6 is more conservative than Alternative 5, with an ACL set at 286,601 lb at a P* level of 31% based on the most recent stock assessment (Nadon et al. 2020) for 2022, 2023, 2024 and 2025. This ACL would further reduce the likelihood that the uku fishery would become unsustainable relative to Alternative 5. The ACT under Alternative 6 would be 282,192 lb, consistent with P* of 26%, reducing the chance that the ACL would be exceeded with an in-season AM. Both in-season and post season AMs are proposed under Alternative 6.

The in-season and post-season AMs under Alternative 6 would operate as described for previous alternatives, with the more conservative ACT and ACL considered relative to the in-season and post-season AMs, respectively. The ACL and ACT based proposed for Alternative 6 marks a substantial decrease in the risk of overfishing relative to other alternatives considered. These ACL and ACT were again proposed in recognition of the relative uncertainty in non-commercial catch estimates in-season. Like Alternatives 3 through 5, Alternative 6 is consistent with all requirements of the Magnuson-Stevens Act and the Hawaii FEP and implementing regulations.

<u>Expected Fishery Outcome</u>

Under Alternative 6, the combined commercial and non-commercial fishery catches would be monitored relative to the ACT of 282,191 lb of uku in-season and an ACL of 286,601 lb post-season, with the possibility of in-season fishery closures in Federal waters if the ACT is projected to be reached and ACL overage adjustments post-season following the methods described for previous alternatives.

We expect the Alternative 6 in-season AM will only occasionally result in closure of Federal waters. In the eleven years from 2010 through 2020 (Table 3), the combined commercial and non-commercial uku catch exceeded the proposed ACT of 282,191 lb once in 2012 when total uku catch was 323,682 lb (Figure 2). Similar to Alternatives 4 and 5, there is roughly a one in three chance that the ACT will be reached in-season one or more times in the 2022-2025 management period under Alternative 6, resulting in in-season closure of Federal waters. As described for Alternative 4 and 5, we anticipate that the implications for commercial and non-commercial fisheries of an in-season closure under Alternative 6 would be relatively small.

The total catch of uku averaged over three years would be compared to the ACL post-season under Alterative 6. As described for Alternatives 3-5, from 2010 to 2020, the three-year average total catch of uku has never reached the ACL (Table 3) and we anticipate that it is very unlikely that an overage adjustment would be needed in in 2022–202. Should the three-year average total catch in the fishery exceed the Alternative 6 ACL post-season, the Council would recommend and NMFS would implement an overage adjustment.

In summary, under Alternative 6, uku fishery management would explicitly consider both the commercial and non-commercial fishery, consistent with management reference points developed in the most recent assessment (Nadon et al. 2020) and consistent with all requirements of the Magnuson-Stevens Act and the Hawaii FEP and implementing regulations. Alternative 6 would implement both in-season and post-season AMs. We anticipate the Alternative 6 ACT may be reached in-season in one or more years during the 2022-2025 management period, resulting in closure of Federal waters to uku retention for the remainder of the year. We do not anticipate that the three-year average total uku catch would exceed the ACL over the 2022–2025 period, requiring an ACL overage adjustment post-season. If the fishery were closed before the end of the fishing year, fishermen could continue to catch uku in State waters since there would not be a corresponding closure of State waters for uku. We anticipate that an in-season closure, if it occurred, would happen relatively late in the fishing season and have small impacts to fishing activities of the commercial and non-commercial fishery, mostly due to the availability of other species for those fisheries to target during the uku fishery closure.

2.3 Alternatives Considered, but Rejected from Further Analysis

Under National Standard 1 of the Magnuson-Stevens Act, it is possible to implement a catch limit equivalent to the OFL (50% risk of overfishing). However, an ACL of 297,624 lb, consistent with the OFL in the current assessment (Nadon et al. 2020), was not considered as an option in deliberations of the SSC and Council because it would not be consistent with the process required under the Hawaii FEP for a Tier 3 stock that incorporates results of the P* analysis (Section 1.1.1). An ACL of 297,624 lb is not analyzed as an alternative in this EA.

Alternatives considering separate ACLs for commercial and non-commercial uku fisheries were not considered here, as previous Council (183rd and 186th meeting) and SSC (140th meeting) deliberations considered, and rejected, separate ACLs for the two fisheries.

2.4 Comparison of Features of the Alternatives

Table 7 presents a summary of key aspects of the two no-action and four action alternatives and allows a quick comparison of features of each of the alternatives.

Table 7. Comparison of the fishery management features and expected outcomes of the alternatives considered.

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
General characteristic of the Alternative	No ACL or AM.	ACL and AMs for commercial catch only. Both in-season and post-season AMs. The status quo management.	ACL and AM for commercial and non-commercial catch. Post-season AM only.	ACL and AM for commercial and non-commercial catch. Both in-season and post-season AMs.	ACL and AM for commercial and non-commercial catch. Both in-season and post-season AMs, ACT to address uncertainty in non-commercial catch estimates.	ACL and AM for commercial and non-commercial catch. Both in-season and post-season AMs, ACT to address uncertainty in non-commercial catch estimates.	Alternative 1 & 2 are no-action alternatives. Alternatives 3 – 6 are action alternatives.
Annual Catch Limit (ACL) and associated P* value.	n/a	122,569 lb P* = 42%, 2016 Assessment (commercial fishery only)	295,419 lb P* = 41%, 2020 Assessment	295,419 lb P* = 41%, 2020 Assessment	295,419 lb P* = 41%, 2020 Assessment	286,601 lb P* = 31%, 2020 Assessment	P* is the probability of overfishing given that catch from either the 2016 Assessment (Nadon 2017) or 2020 Assessment (Nadon et al 2020).

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
Annual Catch Target (ACT) and associated P* value.	n/a	n/a	n/a	n/a	291,010 lb P* = 36%	282,191 lb P* = 26%	P* is the probability of overfishing given that catch level from the 2020 Assessment (Nadon et al 2020).
Complies with Magnuson-Stevens Act, Hawaii FEP	No. ACL and AMs not implemented for uku.	No. Fails to incorporate non-commercial fishery catch included in most recent assessment	Yes	Yes	Yes	Yes	
In-season Accountability Measure	N/A	If commercial catch projected to reach ACL, Federal waters closed to uku retention for the remainder of the year.	N/A	If combined commercial and non-commercial catch projected to reach ACL, Federal waters closed to uku retention for the remainder of the year.	If combined commercial and non-commercial catch projected to reach ACT, Federal waters closed to uku retention for the remainder of the year.	If combined commercial and non-commercial catch projected to reach ACT, Federal waters closed to uku retention for the remainder of the year.	Projection methods the same as deep 7 bottomfish and bigeye tuna fishery projections; observed catch added to imputed catch for periods yet to be fished, based on recent year averages for unfished periods.

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
Post-season Accountability Measure	N/A	If 3-yr average commercial catch exceeded ACL, overage adjustment in the following year.	If combined 3-yr average commercial and non-commercial catch exceeded ACL, overage adjustment in the following year.	If combined 3-yr average commercial and non-commercial catch exceeded ACL, overage adjustment in the following year.	If combined 3-yr average commercial and non-commercial catch exceeded ACL, overage adjustment in the following year.	If combined 3-yr average commercial and non-commercial catch exceeded ACL, overage adjustment in the following year.	

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
Likelihood the uku fishery would have an in-season closure to Federal waters over the 2022-2025 management period.	No potential for a closure. Fishing for uku the MHI could occur year round.	Based on recent catches in the commercial fishery, a closure is unlikely but may occur infrequently. Fishermen would need to discard uku caught in Federal waters if the fishery closed.	No potential for a closure. Fishing for uku the MHI could occur year round.	Based on recent catches in commercial & non-commercial fisheries, probability of a closure in one or more years over the 2022-2025 period is about one in three. Fishermen would need to discard uku caught in Federal waters if the fishery closed.	Based on recent catches in commercial & non-commercial fisheries, probability of a closure in one or more years over the 2022-2025 period is about one in three. Fishermen would need to discard uku caught in Federal waters if the fishery closed.	Based on recent catches in commercial & non-commercial fisheries, probability of a closure in one or more years over the 2022-2025 period is about one in three. Fishermen would need to discard uku caught in Federal waters if the fishery closed.	Probability of closure based on frequency of ACL or ACT (depending on the alternative) overages from 2010-2020. For Alt 4 – 6, combined commercial and non-commercial catch exceeded ACL/ACL 1 in 11 years (9.1%), assuming Bernouli process, probability of exceeding ACL/ACT in at least one of years 2022-2025 is 31.7%.

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
AM 2: Overage adjustment if ACL exceeded	Not applicable.	If the fishery were to exceed an ACL based on a three-year average, NMFS, in consultation with the Council, would apply an overage adjustment to the ACL in the following year.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.	In order to determine the overage in a given year, NMFS would compute the average catch for the three most recent years, and then the resulting amount would be compared to the ACL. The amount over the ACL would be the amount by which the subsequent year's ACL would be reduced.

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
Likelihood that a downward reduction in ACL would occur in any given year	Not applicable.	Very unlikely based on recent catch history. In-season AM will reduce likelihood ACL will be exceeded.	Very unlikely based on recent catch history.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.	Post-season AM is based on recent three year average, which has never exceeded the proposed ACLs across all alternatives since ACLs were defined for uku fisheries. Lack of in-season closure of State waters slightly increases possibility ACL will be exceeded, particularly for alternatives without an ACT.
State of HI fishery closure when the ACL/ACT is expected to be reached	Not applicable (no federally-implemented ACL or AM)	No	No	No	No	No	DLNR administrative rules do not provide for a closure for uku based on the fishery approaching a Federal ACL.

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
Fishing Permits required	State Commercial Marine License required to fish commercially for uku around Hawaii.	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	No non-commercial license is required in Hawaii.
Bag Limits and Size Limits	There is no bag limit for uku. State of Hawaii size limits apply: Uku below one pound may not be speared or sold commercially.	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Size limits would continue to apply unchanged under each alternative.

Fishery Management Topic	Alt. 1.	Alt. 2.	Alt. 3.	Alt. 4.	Alt. 5. (Preferred)	Alt. 6.	Remarks
Catch Monitoring	DLNR, Division of Aquatic Resources collects commercial uku catch data from fishing vessels. Reporting is required for all commercial catches. DLNR and NMFS estimate non-commercial catch by two month wave, using Hawaii Marine Recreational Fishery Survey (HMRFS) and Marine Recreational Information Program (MRIP)	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Same as Alt. 1	Monitoring of commercial and non-commercial catch would be the same for all alternatives.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section is the environmental baseline and describes uku fishing in the main Hawaiian Islands, biological, and socioeconomic resources and other features of the environment that could be affected by the MHI uku fishery. Among the factors discussed are target and non-target species, bycatch, protected species, the fishing community and associated revenues, essential fish habitat (EFH) and habitat areas of particular concern (HAPC), marine protected areas (MPAs), and other vulnerable ecosystems. Chapter 4 evaluates the effects of the six alternatives on the baseline.

3.1 Overview of the Uku Fishery

Information about the Hawaii commercial uku fishery is summarized from the previous EAs for uku (NMFS 2017, NMFS 2020). Alternatives considered in this EA include non-commercial fisheries, and so this overview also considers the non-commercial fishery. Because of the wide habitat range where uku is found, it is commonly taken by handline tackle and troll gear (WPFMC 2021), with the majority of reported catch taken by handline (Figure 3), which is also the primary gear type used to catch Deep 7 bottomfish such as onaga and opakapaka. When using handlines fishermen employ a vertical hook-and-line method of fishing, in which weighted and baited lines are lowered and raised with electric or hydraulic powered reels to the desired fishing depth to target particular species (i.e., "handline"). The main line is typically constructed of dacron, or 400 to 450-pound test monofilament, with hook leaders of 80 to 120-pound test monofilament. The hooks are circle hooks, generally of the Mustad (conventional scale) sizes 11/0, 12/0, and 13/0, and a typical configuration uses six to eight hooks branching off the main line. The weight is typically 5 to 6 pounds. The hook leaders are typically 2 to 3 feet long and separated by about 6 feet along the main line. Squid is typically used as bait, but hooks may also be baited with fish such as aku (*Katsuwonis pelamis*) or bigeye scad (*Selar crumenopthalmus*). Some fishermen may also suspend a chum bag containing chopped fish or squid above the highest hook to attract fish.

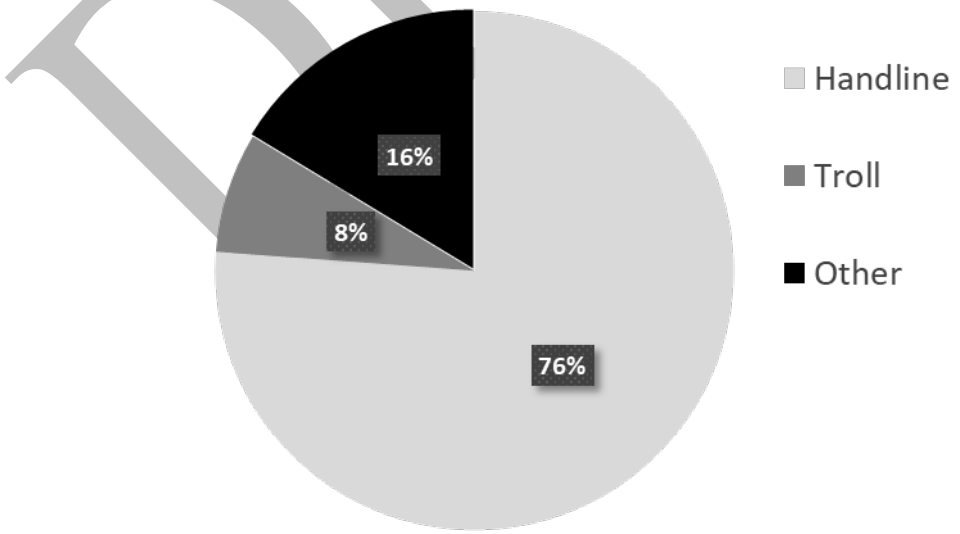

Figure 3. Percent of commercial uku catch in lb by gear type from 2011–2020, where 'other' includes hook and line (casting) and all other methods.

The typical vessel in the commercial MHI bottomfish fleet is made of fiberglass and measures approximately 23 ft long, although there are a few larger full-time commercial vessels in the fishery (Chan and Pan 2017). Specific bottomfish fishing locations favored by fishermen in the MHI vary seasonally according to sea conditions and the availability and price of target species. A 2014 survey of commercial and non-commercial bottomfish fishermen indicates that the majority of MHI bottomfish fishing trips (56%) are limited to state waters, with the balance in the EEZ (Chan and Pan 2017). This is similar to the result of Hospital and Beavers (2012), which reported that the majority of bottomfish trips (66%) are limited to State waters only. bottomfish fishing locations favored by fishermen in the MHI vary seasonally according to sea conditions and the availability and price of target species. Penguin Bank is particularly important for the MHI catch of uku, one of the few bottomfish species available in substantial quantities to Hawaii consumers during summer months.

Uku are generally caught in the commercial fishery in Federal and State waters during single day trips, primarily in summer. The majority of uku catch (~66%) comes from Federal waters (Harvey and Associates 2017). Landings peak from April through June and decline as the yellowfin tuna (*Thunnus albacares*, or ahi) season starts and fishermen shift to targeting the tuna (Figure 4). Figure 4 shows the average standardized catch (year catch for each species minus the average catch of the whole time series divided by the standard deviation) of uku and ahi. Catch of ahi is more than ten times higher than uku, so standardizing the catch allows us to compare relative seasonal trends in the different fisheries. The uku fishery starts earlier than the ahi season and the effort shifts to the latter once the more prized fish come in. Uku landings generally remain low through the rest of the fishing season.

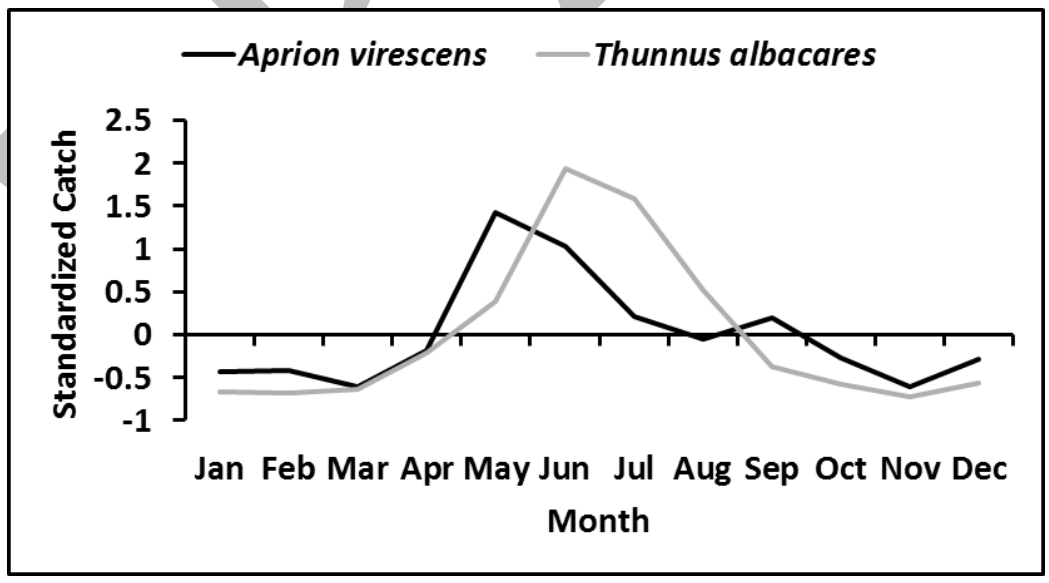

Figure 4. Standardized monthly commercial catches of uku (black) and ahi (gray) from 2012 to 2018.

Non-commercial fisheries were not specifically examined in past EAs. Effort and catch estimates in the non-commercial fishery are broken into boat-based fishing in State waters (≤ 3 miles offshore), Federal waters (>3 miles offshore) and shore-based fishing (Figure 5). Non-commercial effort and catch estimates from Hawaii are published by the NOAA Marine Recreational Information Program (MRIP). These non-commercial effort estimates may include fishing effort from which catch was sold and unlike commercial effort, which are estimated as vessel trips, non-commercial effort estimates are estimates of fishing trips of individual anglers by day, regardless of the number of hours fished (Ref). In the most recent assessment (Nadon et al. 2020) non-commercial catch estimates were corrected to remove sold catch. Over the past 10 years, 86% of non-commercial angler trips where uku were captured occurred in State waters. This is contrasted by average uku catches over the past 10 years (2011-2020) of which only 75% came from State waters (Figure 5). Non-commercial fishing methods include all of the methods used in the commercial fishery with the addition of shore-based hook and line fishing in State waters. A review of all non-commercial fisheries in Hawaii (Torres & Ma 2020), focusing on the fishery in 2015, estimated that only approximately 1% of non-commercial angler trips focused on snappers, including uku.

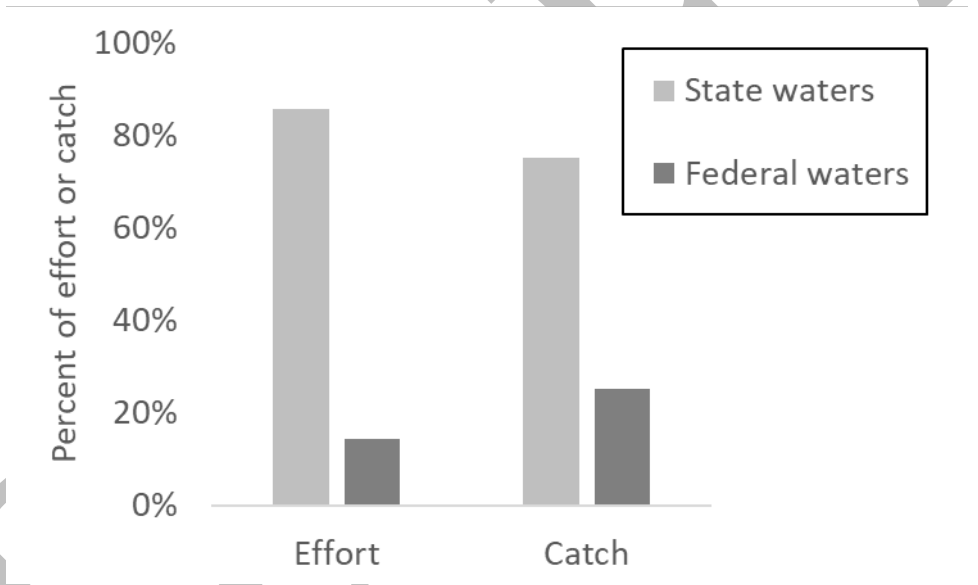

Figure 5. Percent of non-commercial effort where uku was harvested and uku catch from State and Federal waters.
Source: Effort and catch data (2011-2020) obtained from NMFS MRIP website, accessed 08/16/2021.

3.2 Affected Physical Resources

Fishing for uku in the MHI bottomfish fishery is not known to affect air quality, noise, water quality, view planes, or other associated physical resources given the offshore nature of the fishery and relatively small size of vessels used (see Section 3.1).

3.3 Affected Biological Resources

3.3.1 Target and Non-Target Fish Species

The MHI bottomfish fishery targets eight species including snappers, jacks and a single species of grouper. NMFS and the Council manage bottomfish management unit species (BMUS) as two separate stocks: the MHI Deep 7 stock complex and uku. The Deep 7 bottomfish include six snappers (onaga, ehu, gindai, kalekale, opakapaka, and lehi) and one grouper (hapuupuu). Generally, Deep 7 bottomfish are found along high-relief, deep slopes, ranging from 80 to 400 meters (m). Uku may be caught incidentally during Deep 7 bottomfish trips, although at shallower depths. The maximum depth of uku is roughly 230 m (WPFMC 2016).

While fishermen occasionally catch uku as a non-target species during Deep 7 bottomfish fishing operations, it is more typically caught as a target species using similar gear. Fishermen also target uku when fishing for Deep 7 bottomfish is unfavorable due to weather or prohibited due to attainment of the Deep 7 bottomfish ACL. Figure 6 compares catch of uku from 2012–2017 with opakapaka, onaga and ehu, the three principal species in the Deep 7 complex. This period covers recent years when ACLs were implemented for both stocks and the Deep 7 fishery did not close due to reaching the ACL. Uku catch during this period was smaller, though similar in magnitude to opakapaka catch, approximately double onaga catch and five times greater than ehu catch.

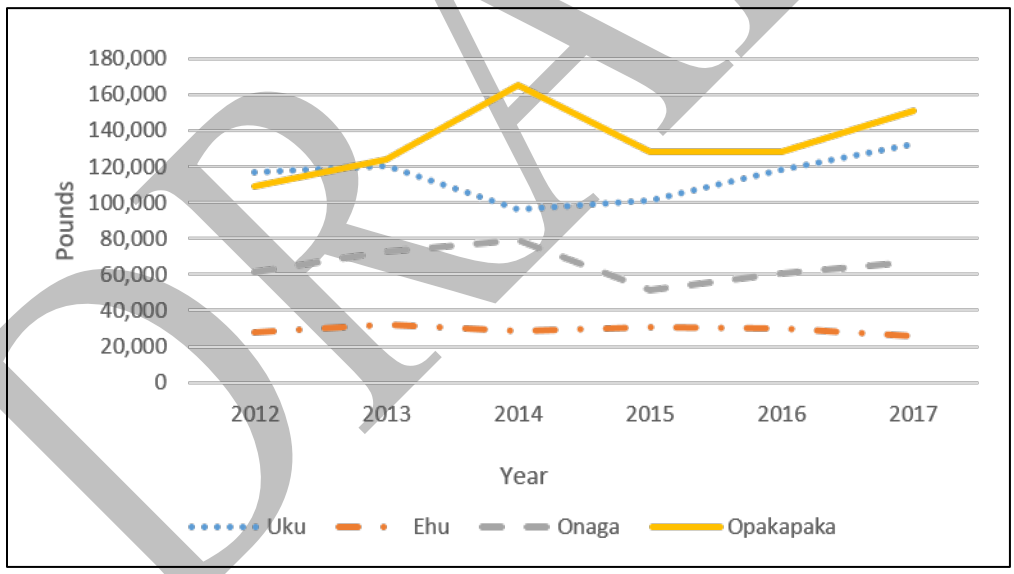

Figure 6. Commercial catch of uku, ehu, onaga and opakapaka from 2011–2020.
Source: WPacFIN website.

3.3.1.1 Target Fish Species – Uku

General background information on uku comes from Amendment 4 of the Hawaii FEP (WPFMC 2016). Uku is in the family Lutjanidae, subfamily Etelinae, and is the only species in its genus. This species is widely distributed throughout the Indian and Pacific oceans from East Africa to Hawaii (Druzhinin 1970, Tinker 1978). Uku reach sexual maturity at an age of 4–5 years and

approximately 42.5–47.5 cm in Hawaii (Everson et al. 1989; Grimes, 1987). Ralston (1979) reported that uku spawns during the summer months. The maximum length is 110 cm (Randall 2007). Haight (1989) reported that uku feed during daytime hours and found the diet of specimens collected from Penguin Bank in the MHI to include fish (89%), larval fish (6%), planktonic crustaceans (1%), shrimp (3%) and crabs (1%). Unlike the benthic species of deepwater lutjanids, uku has feeding habits that do not seem to be constrained by substrate association (Parrish 1987). This species forages throughout the water column (Ralston 1979, Parrish 1987), from the surface down to almost 200 m.

Stock Status for MHI uku

The 2020 uku stock assessment focused on uku only (Nadon et al. 2020), as opposed to the previous assessment that was comprised single-species assessments of 27 reef-associated species around the MHI that included uku (Nadon 2017). The 2020 assessment approach involved the Stock Synthesis approach (Methot 2000) informed by four types of data: historical commercial and recreational catches, catch-per-unit-effort time series time series of body size (weight) frequencies, and fishery-independent diver surveys. The assessment included data processing and CPUE standardization to address issues such as method changes through the non-commercial catch estimate time series as well as removal of catch in the non-commercial data that were identified as sold (Nadon et al. 2020).

The 2020 assessment suggests that spawning stock biomass at the minimum stock size threshold (SSB_{MSST}) is 663,391 lb (301 mt), and the spawning stock biomass in the most recent year in the assessment (2018) is 1,805,584 lb (819 mt) or 2.7 times the SSB_{MSST}. The 2020 assessment estimated the OFL for uku to be 302,033 lb (137 mt), and total catches since 2012 have remained below this level (Table 3). As such, the assessment determined that overfishing was not occurring for uku, it was not overfished, and that the population was likely stable with regard to size composition.

3.3.1.2 Non-Target Fish Species - Bycatch

As is the case for most fisheries, during bottomfish fishing, some of the catch is lost or discarded. Fish may be stripped off the lines by sharks (i.e., lost). The catch might come into the boat but then get deliberately discarded by fishermen if the flesh is damaged by shark bites, or if there are concerns regarding ciguatoxins.

Uku has historically been the primary non-Deep 7 bottomfish species harvested, accounting for approximately 80–90% of the total non-Deep 7 bottomfish catch annually (NMFS 2020). The next most commonly caught non-Deep 7 bottomfish species are white ulua, black ulua, and butaguchi. Bottomfish fishermen generally do not retain kahala because of concerns with ciguatera and parasitic worms in the flesh (WPFMC 2009).

Bycatch information is not readily available from the MHI commercial uku bottomfish fishery. However, bycatch in the broader MHI bottomfish fishery (including Deep 7 and non-Deep 7 bottomfish) was studied by Kawamoto and Gonzales (2005). This study showed that bottomfish fishing is relatively target-specific, and that the bycatch rate is relatively low. Approximately 8.5% of the catch was reported as not retained because it was either lost or deliberately discarded

(Kawamoto and Gonzales 2005). The majority of the bycatch is composed of several jacks that are now classified as ECS (e.g., kahala, butaguchi, and white ulua). Other than these data, there is no recent bycatch information for the commercial MHI bottomfish fishery. Bycatch in the non-commercial fishery is also unknown. As the same gears are used in the non-commercial fishery, we assume that bycatch rate is also relatively low.

While sharks may be incidentally hooked by fishermen fishing for bottomfish, as sharks are attracted to baited hooks, bycatch of sharks is not believed to result in mortality. Fishermen tend to release hooked sharks alive by cutting their hook leaders, and sharks generally do not experience barotrauma when brought up from depth (WPFMC 2009). Additionally, when shark depredation occurs, fishermen generally move to another area to avoid losing more fish.

3.3.2 Protected Species

A number of protected species are documented as occurring in the waters around the Hawaiian Islands including sea turtles, marine mammals, and seabirds. There exists potential for interactions with the MHI uku fishery. This fishery has been evaluated for impacts on protected resources and is managed in compliance with the requirements of the Magnuson-Stevens Act, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act, and other applicable statutes.

3.3.2.1 Species protected under the Endangered Species Act (ESA)

Table 8 lists endangered or threatened species occurring around Hawaii including five sea turtles, the Hawaiian monk seal, five whales, four seabirds, and two fishes.

Table 8. Endangered and threatened marine species and seabirds with the potential to interact with the MHI uku fishery

Common name (*Scientific name*)	ESA listing status in Hawaii	Occurrence in Hawaii
Listed Sea Turtles		
Green sea turtle (*Chelonia mydas*)	Threatened Distinct Population Segment (DPS) in Hawaii	Most common turtle in the Hawaiian Islands. Most nesting occurs in the northwestern Hawaiian Islands. Foraging and hauling out in the MHI.
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered	Small population foraging around Hawaii and low level nesting on Maui and Hawaii Islands.

Common name (*Scientific name*)	ESA listing status in Hawaii	Occurrence in Hawaii
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	No nesting or foraging grounds in Hawaii. Rarely sighted while traveling between nesting and foraging habitats.
Olive riddle sea turtle (*Lepidochelys olivacea*)	Threatened	No nesting or foraging grounds in Hawaii. Infrequently sighted while traveling between nesting and foraging habitats.
North Pacific loggerhead (*Caretta caretta*)	Endangered DPS in Hawaii	No nesting or foraging grounds in Hawaii. Infrequently sighted while traveling between nesting and foraging habitats.
Listed Marine Mammals		
Hawaiian monk seal (*Neomonachus schauinslandi*)	Endangered	Endemic tropical seal. Occurs throughout the archipelago. Population trend uncertain; no mortality or serious injuries attributed to MHI bottomfish fishery (Carretta, et al. 2017).
Blue whale (*Balaenoptera musculus*)	Endangered	No sightings or strandings reported in Hawaii but acoustically recorded off Oahu and Midway Atoll. No record of interactions with the MHI Bottomfish Fishery.
Fin whale (*B. physalus*)	Endangered	Infrequent sightings in Hawaii waters.
Sei whale (*B. borealis*)	Endangered	Worldwide distribution. Primarily found in cold temperate to subpolar latitudes. Rare in Hawaii.
Sperm whale (*Physeter macrocephalus*)	Endangered	Found in tropical to polar waters worldwide. Sighted off the Northwestern Hawaiian Islands (NWHI) and the MHI.

Common name (*Scientific name*)	ESA listing status in Hawaii	Occurrence in Hawaii
MHI insular false killer whale (*Pseudorca crassidens*)	Endangered DPS in Hawaii	Found in waters within 140 km (60 nm) of the MHI.
Listed Sea Birds		
Newell's shearwater (*Puffinus auricularis newelli*)	Threatened	Rare. Breeds only in colonies on the MHI where it is threatened by predators and urban development.
Hawaiian petrel (*Pterodroma phaeopygia*)	Endangered	Rare.
Band-rumped storm-petrel (*Oceanodroma castro*)	Endangered DPS in Hawaii	Rare.
Short-tailed albatross (*Phoebastria albatrus*)	Endangered	Nest in small numbers on Midway Atoll in the NWHI.
Listed Fish		
Giant manta ray (*Manta birostris*)	Threatened	Found worldwide in tropical, subtropical, and temperate bodies of water and is commonly found offshore, in oceanic waters, and near productive coastlines.
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened	Found worldwide in tropical and sub-tropical waters. They live from the surface of the water to at least 498 feet deep.
Critical Habitat		
Monk seal critical habitat	Endangered	Includes the seafloor and marine habitat to 10 m above the seafloor from the 200 m depth contour through the shoreline, and extending into terrestrial habitat 5 m inland from the shoreline between identified boundary points around all islands in the MHI*.

Common name (*Scientific name*)	ESA listing status in Hawaii	Occurrence in Hawaii
Insular False killer whale critical habitat	Endangered DPS in Hawaii	Extends from the 45-m depth contour to the 3,200-m depth contour around the MHI from Niihau east to Hawaii.

Source: NOAA Fisheries endangered species website, accessed December 3, 2018

Applicable ESA Consultations – Hawaii Bottomfish fisheries

In a biological opinion (BiOp) covering MHI bottomfish fisheries (including uku)[5], dated March 18, 2008, NMFS evaluated the impact of the bottomfish fisheries on blue, fin, sei, and sperm whales; green, loggerhead, olive ridley, hawksbill, and leatherback sea turtles; and Hawaiian monk seals. NMFS determined that, except for the Hawaiian green sea turtle, bottomfish fishing activities are not likely to adversely affect any other ESA-listed marine species found in Federal waters of the MHI, or result in the destruction or adverse modification of critical habitat (NMFS 2008).

For green sea turtles, NMFS determined that there is a potential for them to be killed by vessels transiting state waters on route to and from Federal waters around the MHI, and authorized an incidental take of up to two green sea turtles per year. However, this analysis used an estimated 71,800 bottomfish fishing trips per year (NMFS 2008). The total annual numbers of commercial non-Deep 7 bottomfish fishing trips and reports since the 2008 BiOp have been less than 2,400 per year (Table 17). Uku is the primary targeted non-Deep 7 species, so non-Deep 7 trips may be considered a reasonable proxy for the number of uku fishing trips. Therefore, the potential for collisions with bottomfish vessels is substantially lower than estimated in the 2008 BiOp considering the MHI uku fishery. Even with the assumption of a relatively high number of fishing trips, the BiOp concluded that the MHI bottomfish fishery is not likely to jeopardize the existence of green sea turtles.

On April 6, 2016, NMFS issued a final rule that removed the range-wide listing of the green sea turtle and instead listed eight Distinct Population Segments (DPS) as threatened and three DPSs as endangered (81 FR 20057). The Hawaiian green turtle population was listed as a DPS under this rule as the Central North Pacific DPS. NMFS determined that this population should retain a threatened designation under ESA. Because the 2008 BiOp analyzed this same population and its ESA status did not change, NMFS did not re-initiate consultation and the conclusions of the 2008 BiOp remain valid with respect to the green turtle DPS.

NMFS has determined that since completion of the 2008 BiOp, there has been no new information to suggest that the MHI bottomfish fisheries interact with the species considered in

[5] The 2008 BiOp analyzed effects of new management measures for bottomfish fishing in the MHI, including licensing and catch reporting for all bottomfish management unit species (BMUS - Deep 7, uku and several other species) and a total allowable catch for Deep 7 bottomfish. Due to similarity in fishing methods for BMUS, fishing for all these species was covered in this analysis as bottomfish fishing.

that consultation (blue, fin, sei, and sperm whales; green, loggerhead, olive ridely, hawksbill, and leatherback sea turtles; and Hawaiian monk seals) in a manner or to an extent not previously considered in that consultation. Thus, the conclusions of the 2008 BiOp remain valid with respect to these species. (NMFS 2019c).

In 2013, NMFS re-initiated consultation under ESA in response to listing the MHI insular false killer whale distinct population segment under the ESA. In a modification to the 2008 BiOp dated August 7, 2013, NMFS determined that commercial and non-commercial bottomfish fisheries in the MHI may affect, but are not likely to adversely affect MHI insular false killer whales (NMFS 2013b). The BiOp cited the spatial separation between the species and bottomfish fishing activities, the low likelihood of collisions, and the lack of observed or reported fishery interactions, among other reasons (NMFS 2013b).

On July 24, 2018, NMFS designated critical habitat for insular false killer whales from the 45-m depth contour to the 3,200-m depth contour around the MHI from Niihau east to Hawaii (83 FR 35062). This area encompasses the geographic and depth ranges of the bottomfish fishery in the MHI. Under the Magnuson-Stevens Act, prey species are also considered to be part of critical habitat. Though three carangid non-Deep 7 bottomfish species (kahala, white ulua, and black ulua) have been described as IFKW prey species, uku has not (NMFS 2018). Also, in its biological report for the designation of IFKW critical habitat, NMFS concluded that "because these prey species represent an insignificant fraction of total bottomfish fishery harvests, adverse impacts to MHI IFKW critical habitat are not expected" (NMFS 2018) and determined that the proposed action may affect, but is not likely to adversely modify MHI IFKW DPS critical habitat (NMFS 2019c). On February 1, 2019 NMFS initiated informal consultation under ESA to seek concurrence with this conclusion, as required by 50 CFR 402.16.

On August 21, 2015, (80 FR 50925) NMFS published a final rule to designate areas in the MHI as monk seal critical habitat. Specific areas for designation include sixteen occupied areas within the range of the species: ten areas in the Northwestern Hawaiian Islands (NWHI) and six in the MHI (NMFS 2014). These areas contain one or a combination of habitat types: preferred pupping and nursing areas, significant haul-out areas, and/or marine foraging areas, that will support conservation for the species. Specific areas in the MHI include marine habitat from the 200 m depth contour line, including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor, through the water's edge 5 m into the terrestrial environment from the shoreline between identified boundary points on the islands of: Kaula, Niihau, Kauai, Oahu, Maui Nui (including Kahoolawe, Lanai, Maui, and Molokai), and Hawaii. In areas where critical habitat does not extend inland, the designation ends at the mean lower low water line.

As a result of the August 21, 2015 final rule designating monk seal critical habitat in the MHI, NMFS initiated consultation on the continuation of the bottomfish fishery in the Hawaiian archipelago (NMFS 2016). In a memo dated March 1, 2016, NMFS concurred with a determination that the bottomfish fishery is not likely to adversely affect the designated Hawaiian monk seal critical habitat because effects of the proposed action are expected to be discountable or insignificant. Specifically, NMFS determined,

- there exists spatial separation between the fishery and monk seal haul-out, pupping and nursing areas

- removal of bottomfish species by the fishery will not have a discernable overall effect on monk seal forage items
- fishing gear is unlikely to cause discernable changes to bottom structure.

On January 30, 2018, NMFS published a final rule listing oceanic whitetip sharks as threatened species under the ESA (83 FR 4153). Information for the oceanic whitetip shark is summarized primarily from the 2016 Status Review (Young et al. 2016), the final listing rule (83 FR 4153), and other sources cited below.

The oceanic whitetip shark is distributed worldwide in epipelagic tropical and subtropical waters between 30° N and 35° S. The species is highly migratory and typically found offshore in deep waters. NMFS has determined that protective regulations under ESA section 4(d) are not necessary or appropriate for the conservation of the species at this time. Accordingly, incidental take of the oceanic whitetip is not prohibited under the ESA section 9.

The most recent stock assessment by Tremblay-Boyer et al. (2019) estimated current biomass of oceanic whitetip sharks in the western and central Pacific Ocean to be 494 t. Using methods presented in the 2016 Status Review (Young et al. 2016) estimates 494 t of shark biomass would be equivalent to roughly 13,500 individuals.

Based on commercial and non-commercial logbooks and voluntary reports, Hawaii bottomfish fishermen have documented interactions with oceanic whitetip sharks; however, from 2000–2017 interactions have been infrequent (0.236 per year) and there are questions about species identification. NMFS determined that bottomfish fishing may affect and is likely to adversely affect the oceanic whitetip shark (NMFS 2019c). Even though NMFS determined the fishery is likely to adversely affect oceanic whitetip shark, we determined on February 1, 2019 and again on July 9, 2021 that the continued operation of the fishery is not likely to jeopardize this species during the period of consultation, or result in an irreversible or irretrievable commitment of resources precluding implementation of any reasonable and prudent alternatives (NMFS 2019b, NMFS 2021). On February 1, 2019 NMFS initiated formal consultation under ESA to determine whether bottomfish fishing activities are likely to jeopardize the continued existence of this species, as required by 50 CFR 402.16.

On January 22, 2018, NMFS published a final rule listing giant manta rays as threatened species under the ESA (83 FR 2916). Information for the giant manta ray is summarized primarily from the 2016 Status Review (Miller and Klimovich 2017), the final listing rule (83 FR 2916), and other sources cited below. NMFS has determined that protective regulations under ESA section 4(d) are not necessary or appropriate for the conservation of the species at this time. Accordingly, incidental take of the manta ray is not prohibited under the ESA section 9.

The giant manta ray is found worldwide in tropical, subtropical, and temperate bodies of water. It is commonly found offshore, in oceanic waters, and near productive coastlines. The giant manta ray is considered a migratory species, with estimated distances travelled of up to 1,500 km. There are no current or historical estimates of the global abundance of giant manta ray. Hawaii bottomfish fisheries do not target giant manta rays for meat or gill rakers, and there are no records of giant manta ray incidental captures or entanglements. Giant manta rays feed on plankton (Miller and Klimovich 2017), making it highly improbable that the rays would attempt to prey on

fish-baited hooks used in these fisheries, or become entangled in fishing gear. There are no reported or observed collisions with giant manta rays bottomfish fishing vessels in any island area. Given this information, NMFS expects the bottomfish fishery to have discountable or insignificant effects on the giant manta ray population. On February 1, 2019 NMFS initiated informal consultation under ESA to seek concurrence with this determination, as required by 50 CFR 402.16. Also, on February 1, 2019, and again on July 9, 2021, NMFS SFD determined that the conduct of the Hawaii bottomfish fisheries during the period of consultation will not violate ESA Section 7(a)(2) and 7(d) with respect to these listings.

On April 15, 2021 NMFS announced a 90-day finding on a petition to list the shortfin mako shark (*Isurus oxyrinchus*) as threatened or endangered under the ESA and to designate critical habitat concurrent with the listing, so NMFS is initiating a status review of the species to determine whether listing under the ESA is warranted (86 FR 19863). The shortfin mako is a large pelagic shark that occurs across all temperate and tropical ocean waters. Previously, NMFS determined that the shortfin mako shark in the North Pacific Ocean was not overfished or experiencing overfishing based on a 2018 stock assessment (ISC 2018). As a pelagic shark, the shortfin mako is not known to interact with MHI uku fisheries, and it was not discussed in the 2020 EA. The alternatives under consideration are not expected to change the fishery in any way, and would not be expected to change the level of interactions with the shortfin mako shark (86 FR 19863) in response to a petition. If the short fin mako shark is listed, NMFS would consult as required under section 7 of the ESA to determine the effects of the fishery on this species.

3.3.2.2 Species protected under the Marine Mammal Protection Act (MMPA)

Several non-ESA listed whales, dolphins, and porpoises occur in waters around Hawaii. All marine mammal species are protected under provisions of the MMPA. Table 9 provides a list of non-ESA listed marine mammals known to or reasonably expected to occur in waters around the Hawaiian Archipelago that have the potential to interact with MHI bottomfish fisheries.

The commercial and non-commercial bottomfish fisheries in the MHI are not known to have adverse effects on non-ESA listed marine mammals (Table 9). Although all species occur in the EEZ where the fisheries operate, the only interactions documented between these fisheries and the marine mammals listed in Table 9 are some recorded observations of bottlenose dolphins (*Tursiops truncatus*) stealing fish from bottomfish fishing lines near Hawaii and Kaula Island (Nitta and Henderson 1993). A rate of 2.67 dolphin-damaged fish per 1,000 was observed in the NWHI bottomfish fishery by NMFS observers between 1990 and 1993 (Kobayashi and Kawamoto 1995). The impact of the bottomfish fishery on the behavior or foraging success of bottlenose dolphins is unknown, but is not known to be adverse. The other species listed in Table 9 may be found within the action area and could interact with bottomfish fisheries in the MHI; however, no incidental takes of these species have been reported.

Table 9. Non-ESA-listed marine mammals occurring in waters around the MHI

Common Name	Scientific Name	Interactions with MHI bottomfish fishery
Blainville's beaked whale	*Mesoplodon densirostris*	No interactions observed or reported.

Common Name	Scientific Name	Interactions with MHI bottomfish fishery
Bottlenose dolphin	*Tursiops truncatus*	Some interactions observed or reported.
Bryde's whale	*Balaenoptera edeni*	No interactions observed or reported.
Common dolphin	*Delphinus delphis*	No interactions observed or reported.
Cuvier's beaked whale	*Ziphius cavirostris*	No interactions observed or reported.
Dall's porpoise	*Phocoenoides dalli*	No interactions observed or reported.
Dwarf sperm whale	*Kogia sima*	No interactions observed or reported.
False killer whale (other than MHI Insular DPS)	*Pseudorca crassidens*	No interactions observed or reported.
Fraser's dolphin	*Lagenodelphis hosei*	No interactions observed or reported.
Humpback whale	*Megaptera novaeangliae*	No interactions observed or reported.
Killer whale	*Orcinus orca*	No interactions observed or reported.
Longman's beaked whale	*Indopacetus pacificus*	No interactions observed or reported.
Melon-headed whale	*Peponocephala electra*	No interactions observed or reported.
Minke whale	*B. acutorostrata*	No interactions observed or reported.
Pantropical spotted dolphin	*Stenella attenuate*	No interactions observed or reported.
Pygmy killer whale	*Feresa attenuata*	No interactions observed or reported.
Pygmy sperm whale	*K. breviceps*	No interactions observed or reported.
Risso's dolphin	*Grampus griseus*	No interactions observed or reported.
Rough-toothed dolphin	*Steno bredanensis*	No interactions observed or reported.
Short-finned pilot whale	*Globicephala macrorhynchus*	No interactions observed or reported.
Spinner dolphin	*Stenella longirostris*	No interactions observed or reported.
Spotted dolphin	*Stenella attenuata*	No interactions observed or reported.
Striped dolphin	*Stenella coeruleoalba*	No interactions observed or reported.

Souce: WPFMC (2021).

Applicable MMPA Coordination – Hawaii Bottomfish Fisheries

The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S., and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction). Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries (LOF) that classifies U.S. commercial fisheries into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. A Category I fishery is one with frequent incidental morality and serious injury of marine mammals. A Category II fishery is one with occasional incidental morality and serious injury of marine

mammals. A Category III fishery is one with a remote likelihood or no known incidental morality and serious injury of marine mammals.

On May 16, 2019 (84 FR 22051), NMFS published the final LOF for 2019 which classified the Hawaii bottomfish handline fishery as a Category III fishery under Section 118 of the MMPA. Participants in Category III fisheries are not required to register in the Marine Mammal Authorization Program prior to engaging in commercial fishing. The proposed action does not change the conduct of the bottomfish fishery in any way and therefore will not introduce impacts not previously considered in prior MMPA determinations and the LOF classification.

3.3.2.3 Seabirds of the Hawaiian Archipelago

Seabirds forage in both State and Federal waters, but are not known, and are unlikely to interact with the MHI bottomfish fishery. Interactions with the bottomfish fishery are unlikely because of the methods used to deploy and retrieve fishing tackle. Bottomfish fishermen drop a weighted mainline vertically over the side of the vessel, and the hooks sink rapidly beyond the range of a diving seabird. Electric or hydraulic pullers retrieve lines rapidly. The time that bait is within the range of a diving seabird is limited, and the proximity of the vessel hull and fishermen to the bait is a significant deterrent against seabirds becoming hooked. There have been no reports of interactions between the MHI bottomfish fishery and seabirds.

Table 10 lists all of the seabirds found on and around Hawaii that could potentially interact with fisheries. The short-tailed albatross, an endangered species, is a migratory seabird that nests in low numbers in the NWHI and has been seen flying over the waters around Hawaii. Other listed seabirds found in the region are the endangered Hawaiian petrel, the Band-rumped storm-petrel, and the threatened Newell's shearwater. Non-ESA-listed seabirds known to be present in Hawaii include the black-footed albatross, Laysan albatross, wedge-tailed, Audubon's, short-tailed and Christmas shearwaters, as well as the masked, brown, and red-footed boobies (or gannets), and a number of petrels and terns, frigate birds, and tropicbirds.

Table 10. Sea birds occurring in waters around the MHI. R= Resident/Breeding; V= Visitor/Migrant.

R/V	Common name	Scientific name
R	Hawaiian petrel	*Pterodroma phaeopygia* (ESA: Endangered)
R	Band-rumped storm-petrel	*Oceanodroma castro* (ESA: Endangered DPS)
R	Newell's shearwater	*Puffinus auricularis newelli* (ESA: Threatened)
V	Short-tailed albatross	*Phoebastria albatrus* (ESA: Endangered)
R	Black-footed albatross	*Ph. nigripes*
R	Laysan albatross	*Ph. immutabilis*
R	Wedge-tailed shearwater	*Puffinus pacificus*
V	Short-tailed shearwater	*Pu. tenuirostris*
R	Christmas shearwater	*Pu. nativitatis*
V	Leach's storm-petrel	*Oceanodroma leucorhoa*

R/V	Common name	Scientific name
R	Red-footed booby	*Sula sula*
R	Brown booby	*S. leucogaster*
R	Masked booby	*S. dactylatra*
R	White-tailed tropicbird	*Phaethon lepturus*
R	Red-tailed tropicbird	*Ph. rubricauda*
R	Great frigatebird	*Fregata minor*
R	Sooty tern	*Onychoprion fuscatus, formerly Sterna fuscata*
R	Brown noddy	*Anous stolidus pileatus*
R	Black noddy	*A. minutus melanogenys*
R	White tern / Common fairy-tern	*Gygis alba rothschildi*

Source: Pyle and Pyle (2017)

3.3.3 Habitats and Vulnerable Ecosystems

3.3.3.1 Essential Fish Habitat

Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Act as those waters and substrate that are necessary for fish spawning, breeding, feeding, and growth to maturity. This includes marine areas and their chemical and biological properties that are utilized by inhabiting organisms. Substrate includes sediment, hard bottom, and other structural relief underlying the water column as well as their associated biological communities. In 1999, the Council developed and NMFS approved Amendment 6 to the Bottomfish and Seamount Groundfish FMP (74 FR 19067, April 19, 1999), which defined EFH for MHI bottomfish.

In 2009, the Council developed and NMFS approved five new archipelagic-based FEPs. The FEPs incorporated and reorganized elements of the Councils' species-based FMPs into spatially-oriented plans (75 FR 2198, January 14, 2010). EFH definitions and related provisions for all FMP fishery resources were subsequently carried forward into the respective FEPs. In addition to and as a subset of EFH, the Council described Habitat Areas of Particular Concern (HAPC) based on the following criteria: ecological function of the habitat is important, habitat is sensitive to anthropogenic degradation, development activities are or will stress the habitat, and/or the habitat type is rare. In considering the potential impacts of a proposed fishery management action on EFH, all designated EFH must be considered.

In 2016, NMFS refined the Hawaii seamount groundfish EFH and HAPC by categorizing BMUS into three assemblages (i.e., Shallow, Intermediate, and Deep) and identifying EFH and HAPC for each group by life stage (WPFMC and NMFS 2016). Table 11 revisits the species listed in (WPFMC and NMFS 2016) and organizes the species which remain in the FEP as BMUS according to these assemblages.

Table 11. Depth assemblage for all Hawaii BMUS

Depth Assemblage	Common Name	Scientific Name	Local Name
Shallow	Gray jobfish	*Aprion virescens*	uku
Intermediate	Silver jaw snapper	*Aphareus rutilans*	lehi
Intermediate	Hawaiian grouper	*Hyporthodus quernus*	hapuupuu
Intermediate	Pink snapper	*Pristipomoides filamentosus*	opakapaka
Deep	Short-tail red snapper	*Etelis carbunculus*	ehu
Deep	Long-tail red snapper	*E. coruscans*	onaga
Deep	Lavender snapper	*P. sieboldii*	kalekale
Deep	Banded snapper	*P. zonatus*	gindai

The designated areas of EFH for bottomfish are summarized in Table 12. HAPC is the same for all life stages and is summarized in Table 13.

Table 12. EFH for MHI bottomfish

Assemblage	EFH (eggs)	EFH (post-hatch pelagic)	EFH (post-settlement)	EFH (sub-adult/adult)
Shallow	Pelagic zone of the water column in depths from the surface to 240 m, extending from the official US baseline to a line on which each point is 50 miles from the baseline	Same as eggs	Benthic or benthopelagic zones, including all bottom habitats, in depths from the surface to 240 m bounded by the official US baseline and 240 m isobath	Same as post-settlement

Assemblage	EFH (eggs)	EFH (post-hatch pelagic)	EFH (post-settlement)	EFH (sub-adult/adult)
Intermediate	Pelagic zone of the water column in depths from the surface to 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*) extending from the official US baseline to a line on which each point is 50 miles from the baseline	Pelagic zone of the water column in depths from the surface 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*), extending from the officialU.S. baseline to the EEZ boundary	Benthic (*H. quernus* and *A. rutilans*) or benthopelagic (*A. rutilans* and *P. filamentosus)* zones, including all bottom habitats, in depths from the surface to 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*) bounded by the 40 m isobath and 100 m (*P. filamentosus),* 280 m (*A. rutilans*) or 320 m (*H. quernus*) isobaths	Same as post-settlement
Deep	Pelagic zone of the water column in depths from the surface to 400 m, extending from the officialU.S. baseline to a line on which each point is 50 miles from the baseline	Pelagic zone of the water column in depths from the surface to 400 m, extending from the officialU.S. baseline to the EEZ boundary	Benthic zone, including all bottom habitats, in depths from 80 to 400 m bounded by the officialU.S. baseline and 400 m isobath	Benthic (*E. carbunculus* and *P. zonatus*) or benthopelagic (*E. coruscansi*) zones, including all bottom habitats, in depths from 80 to 400 m bounded by the officialU.S. baseline and 400 m isobaths

Table 13. HAPC for all life stages of MHI bottomfish

Island	Oahu	Molokai	Maui	Kahoolawe	Hawaii
Locations*	Kaena Point, Kaneohe Bay, Makapuu	Penguin Bank	Pailolo Channel	North Kahoolawe	Hilo

* See Amendment 4 to the Hawaii FEP for specific site HAPC locations (WPFMC and NMFS 2016)

3.3.3.2 EFH/HAPC for other MUS

The MHI bottomfish fishery fishes for uku in areas that have been designated as EFH and HAPC for other insular management unit species including Kona crab, deepwater shrimp, precious corals, and Pelagic MUS. EFH and HAPC for these other species are listed in Table 14 (Insular MUS) and Table 15 (Pelagic MUS).

Table 14. EFH and HAPC for all life stages of crustacean MUS

Species/Species complex	EFH	HACP
Kona crab : Kona crab (*Ranina ranina*)	**Eggs and larvae:** the water column from the shoreline to the outer limit of the EEZ down to a depth of 150 m (75 fm) **Juvenile/adults:** all of the bottom habitat from the shoreline to a depth of 100 m (50 fm)	All banks in the NWHI with summits less than or equal to 30 m (15 fathoms) from the surface
Deepwater shrimp (all FEP areas): (*Heterocarpus* spp.)	**Eggs and larvae:** the water column and associated outer reef slopes between 550 and 700 m **Juvenile/adults:** the outer reef slopes at depths between 300-700 m	No HAPC designated for deepwater shrimp.

Table 15. EFH and HAPC for all life stages of Pelagic MUS

Species Complex	EFH	HAPC

Species Complex	EFH	HAPC
Temperate species Striped Marlin (Tetrapurus audax), Bluefin Tuna (Thunnus thynnus), Swordfish (Xiphias gladius), Albacore (Thunnus alalunga), Mackerel (Scomber spp.), Bigeye (Thunnus obesus), Pomfret (family Bramidae)	**Eggs and larvae:** the (epipelagic zone) water column down to a depth of 200 m (100 fm) from the shoreline to the outer limit of the EEZ **Juvenile/adults:** the water column down to a depth of 1,000 m (500 fm) from the shoreline to the outer limit of the EEZ	The water column from the surface down to a depth of 1,000 m (500 fm) above all seamounts and banks with summits shallower than 2,000 m (1,000 fm) within the EEZ
Tropical species Yellowfin (*Thunnus albacares*), Kawakawa (*Euthynnus affinis*),Skipjack (*Katsuwonus pelamis*),Frigate and bullet tunas (*Auxis thazard, A. rochei*), Blue marlin (*Makaira nigricans*), Slender tunas (*Allothunnus fallai*), Black marlin (*Makaira indica*), Dogtooth tuna (*Gymnosarda unicolor*), Spearfish (*Tetrapturus* spp.), Sailfish *(Istiophorus platypterus*), Mahimahi (*Coryphaena hippurus, C. equiselas*), Ono (*Acanthocybium solandri*), Opah (*Lampris* spp.*)*	Same as EFH for temperate pelagic MUS	Same as HAPC for temperate pelagic MUS
Sharks Pelagic thresher shark (*Alopias pelagicus*), Bigeye thresher shark (*Alopias superciliousus)*, Common thresher shark (*Alopias vulpinus*), Silky shark (*Carcharhinus falciformis*), Oceanic whitetip shark (*Carcharhinus longimanus*), Blue shark (*Prionace glauca*), Shortfin mako shark (*Isurus oxyrinchus*), Longfin mako shark (*Isurus paucus*), Salmon shark (*Lamna ditropis*)	Same as EFH for temperate pelagic MUS	Same as HAPC for temperate pelagic MUS
Squid Neon flying squid (*Ommastrephes bartamii*), Diamondback squid (*Thysanoteuthis rhombus*), Purple flying squid *(Sthenoteuthis oualaniensis)*	Same as EFH for temperate pelagic MUS	Same as HAPC for temperate pelagic MUS

3.3.3.2 Marine Protected Areas

Bottomfish fishing is prohibited in the following marine protected areas (MPAs): State of Hawaii Bottomfish Restricted Fishing Areas (BRFAs) for Deep 7 bottomfish, and for all bottomfish in Kahoolawe Island Reserve, Papahānaumokuākea Marine National Monument, and in State of Hawaii MPAs where and/or when fishing is prohibited. Uku fishing is not prohibited in the State of Hawaii BRFAs. Bottomfish fishing does occur in the Hawaiian Islands Humpback Whale National Marine Sanctuary, but is not known to adversely affect any of the resources or habitat of the Sanctuary. Other areas considered to have sensitive habitat value include areas designated by NMFS and the Council as EFH and HAPC, and critical habitat (see above, section 3.3.2.1).

3.3.3.3 Vulnerable Marine or Coastal Ecosystems

There are several species of precious corals found in Hawaii. These corals are typically grouped into shallow (10-50 fm) and deep (150-750 fm) groups. Black corals in the *Antipathes* and *Myripathes* genera comprise the shallow group; while pink (*Corallium*), gold (*Callogorgia, Calyptrophora, Gerardia,* and *Narella*), and bamboo (*Acanella* and *Lepidisis*) corals make up the deep group. Studies have found that some of the deepwater species may live in the range of two to four thousand years (Roark et al. 2009)

Known precious coral beds in the action area in the MHI are located off the southern shore of Kauai, Oahu (Makapuu and Kaena point), Maui (Auau Channel), Hawaii Island (Keahole point and between Milolii and South Point; Table 16 ; NMFS 2013a). The beds off southern Kauai and in the Auau channel are black coral beds, and generally shallower than the depth zone where fishing for Deep 7 bottomfish is conducted. Known beds of pink, gold and bamboo corals are found at Makapuu, Kaena point and Keahole Point. The precious coral beds off Kaena Point and Makapuu are located within BRFAs established by the State of Hawaii (https://dlnr.hawaii.gov/dar/fishing/bottom-fishing/).

Table 16. EFH and HAPC for precious corals in the MHI

Coral Group	Island	Area	EFH	HAPC
Shallow water	Kauai	Southern border	Yes	No
	Maui	Auau Channel	Yes	Yes
	Hawaii	Milolii to South Point	Yes	No
Deep water	Oahu	Kaena Point	Yes	No
	Oahu	Makapuu	Yes	Yes
	Keahole Point	Hawaii	Yes	No

3.4 Socio-economic Setting

Considered in the socioeconomic setting of the MHI uku fishery is the applicable fishing community, both commercial and non-commercial, ex-vessel catch values and revenues, and environmental justice issues.

3.4.1 Fishing Communities

The Magnuson-Stevens Act defines a fishing community as "...a community that is substantially dependent upon or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew, and fish processors that are based in such communities" (16 U.S.C. 1802 (16)). NMFS further specifies in the National Standard guidelines that a fishing community is "...a social or economic group whose members reside in a specific location and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries dependent services and industries (for example, boatyards, ice suppliers, tackle shops)". National Standard 8 of the Magnuson-Stevens Act requires that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and the rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (a) provide for the sustained participation of such communities and (b) to the extent practicable, minimize adverse economic impacts on such communities.

In 2002, the Council identified each of the islands of Kauai, Niihau, Oahu, Maui, Molokai, Lanai and Hawaii as a fishing community for the purposes of assessing the effects of fishery conservation and management measures on fishing communities, providing for the sustained participation of such communities, minimizing adverse economic impacts on such communities, and for other purposes under the Magnuson-Stevens Act. The Secretary of Commerce subsequently approved these definitions on August 5, 2003 (68 FR 46112). As a result, for the current proposed action, the fishing communities are each of the seven populated areas. The fishermen from these areas who fish for uku and bottomfish could be affected by the management measure, and the related community members that rely on uku would also be indirectly affected through the availability of uku in the short and long-term for sale or consumption. In general the uku fishery is considered sustainable, and provides a local source of fresh fish for distribution and consumption. Uku fishing activities and uku consumption are not known to result in public health or safety issues.

3.4.1.1 Fishery Participants

Commercial

Any person taking any marine life for commercial purposes in Hawaii is required to obtain a commercial marine license (CML) from the State of Hawaii and submit monthly reports of all catch to the Division of Aquatic Resources. The collection of commercial fishing reports comes through two sources: paper reports received by mail, fax, or PDF copy via e-mail, and reports filed online through the Online Fishing Report system. These data are shared with NMFS and the Council for tracking catches relative to the ACL. The number of fishermen licensed to

commercially harvest bottomfish in the MHI increased dramatically in the 1970s, and peaked in late 1980s with 509 active vessels in a single year. However, participation in the fishery then declined in the early 1990s, rebounded somewhat in the late 1990s, but has decreased in recent years to a low of 252 licensed vessels in 2020. In the last 10 years, an average of 355 licensees have reported uku catch each year. Of the licenses reporting catching uku over the past 10 years, 40.9% report deep-sea handlining, 14.4% report inshore handlining, 8.6% report trolling, and 36.2% report other methods, primarily casting.

Annual catch limits were first specified for non-Deep 7 bottomfish in 2012. Since that time, participation in the commercial fishery sector (measured by the number of fishermen with licenses reporting catch of uku) has shown a slow but increasing decline since 2015 (Table 17). Effort, measured by the number of fishing trips, has also decreased, especially in the last three years. The overall number of commercial uku fishing reports generally mirrors total trips, with a clear decline in the last three years (Table 17).

Table 17. Summary of fishing activity in the commercial uku fishery from 2010 to 2020

Year	Licenses	trips	# reports	No. caught
2010	407	1,924	1,075	13,660
2011	383	1,700	986	13,048
2012	407	1,754	1,075	13,600
2013	395	1,814	1,054	14,052
2014	379	1,679	1,004	11,687
2015	417	1,846	1,085	12,882
2016	378	1,915	1,051	15,133
2017	363	1,775	1,018	17,503
2018	286	1,235	746	10,145
2019	286	1,295	793	11,106
2020	252	1,024	622	5,937
5-yr avg.	313	1449	846	11,965
10-yr avg.	355	1604	943	12,509

Source: WPFMC (2021).

Non-Commercial

A Main Hawaiian Islands Non-Commercial Bottomfish Permit is required for any person, including vessel owners, fishing non-commercially for bottomfish management unit species in the EEZ around the main Hawaiian Islands. If the fisherman possesses a current state of Hawaii CML or is a charter fishing customer, he or she is not required to have this permit. There are very limited data on the non-commercial fishing sector for uku in the MHI. In 2007, NMFS and the Council implemented a suite of measures to monitor fishing mortality of MHI bottomfish (including Deep 7 and non-Deep 7 bottomfish), including mandatory permit and reporting requirement for the non-commercial bottomfish sector in Federal waters to complement the Hawaii commercial license reporting requirement (WPFMC and NMFS 2007). Initially, NMFS issued 76 non-commercial bottomfish permits in 2008 and 91 in 2009; however, since then, the number of permits issued has declined precipitously to two in 2018 and zero in 2021. Similarly, four catch reports were received the first two years of the program, but no reports have been received since 2011.

It has been suggested that some non-commercial bottomfish fishermen have opted to obtain a State CML rather than the Federal non-commercial permit, because there is no bag limit associated with the State CML and the CML had cost roughly the same amount as the Federal permit. Although the State doubled the cost of a CML recently, the change in cost did not result in a migration back to Federal non-commercial permits. Cost-earning surveys conducted by Hospital and Beavers (2012) report that over 20% of CML holders do not sell any bottomfish, indicating that a substantial number of CML holders are non-commercial. Therefore, it is possible that some non-commercial catch of uku is being reported through the CML system rather than through Federal non-commercial logbooks. However non-commercial catch from fishermen who do not have a CML, and that fish in State waters, is not reported because the State does not require a license or catch reporting for non-commercial fishing in State waters. However, uku catch from non-commercial fishing in State waters is estimated by HMRFS and MRIP surveys.

Subsistence fishing

Although uku are caught for home consumption, uku fishing is not considered to be part of a subsistence fishery. Conversely, the uku fishery does not affect any subsistence harvest or gathering.

Safety at Sea

As it has been conducted historically, the uku fishery does not have notable concerns with safety at sea, as might be the case in a fishery severely constrained by an ACL. In fisheries constrained by an ACL, limited available catch encourages fishermen to go out in poor weather conditions that compromise their safety, in the hopes that they can land some of the ACL before the fishery closes. The uku fishery, as part of the non-Deep 7 fishery prior 2019, has not approached its ACL recently, and an in-season closure for the uku fishery has not occurred to date. Accordingly, this issue has not been a problem for uku fishermen in Hawaii.

3.4.1.2 Revenue

In 2020, uku commercial fishermen landed an estimated 37,530 lb of uku, which was sold for an estimated total of $180,966 at a value of $4.82 per lb (Table 18). This large drop in catch and value relative to prior years is attributed to COVID-19 restrictions to tourism in Hawaii, and the resulting low demand for uku from the restaurant industry (WPFMC 2020). Even ignoring the low sales numbers in 2020, uku sold volume in 2018 and 2019 was the lowest since 2010, despite relatively high prices (Table 18).

Table 18. Summary of estimated revenue in MHI uku fishery

Year	Lb. caught	Lb. sold	Est. value ($)	Price ($/lb)
2010	121,046	109,125	428,151	3.92
2011	109,432	94,056	489,137	4.43
2012	116,395	92,831	481,547	4.53
2013	121,476	102,079	484,757	4.22
2014	97,003	82,571	407,285	4.44
2015	101,897	92,063	467,416	4.62
2016	118,622	113,662	608,039	4.96
2017	132,710	124,762	633,665	4.83
2018	75,250	69,495	381,400	5.32
2019	90,016	82,756	424,630	5.05
2020	47,912	37,530	180,966	4.82
5-yr avg.	92,902	85,641	445,740	5.00
10-yr avg.	101,071	89,181	455,884	4.72

Source: WPFMC (2021).

3.4.2 Scientific, Historic, Cultural and Archaeological Resources

A number of historical and archaeological resources could be found in Federal waters of the MHI, but there are no known districts, sites, highways, structures or objects that are listed in or eligible for listing in the National Register of Historic Places in the areas in which the federal uku fishery operates. Shipwrecks may exist in areas in which the fishery operates, but this fishery is not known to adversely affect shipwrecks. Bottomfish fishermen tend to avoid fishing in or anchoring on or near known shipwrecks in order to avoid losing gear.

There are no known fishing koa (traditional fishing grounds) in Federal waters in which the MHI bottomfish fishery operates. Unique scientific resources may occur in marine protected areas in the MHI, where fishing activity including uku fishing is restricted by state laws.

3.5 Management Setting

3.5.1 Administrative and Regulatory Processes

Under the authority of the Magnuson-Stevens Act, NMFS is responsible for implementing regulations to sustainably manage the BMUS fishery in Federal waters surrounding the MHI. The

NOAA Office of Law Enforcement (OLE) and the U.S. Coast Guard enforce Federal fisheries rules. They may conduct enforcement activities through patrols both on and off the water, and they also conduct criminal and civil investigations. The Enforcement Section of the NOAA Office of General Counsel provides legal support to the NOAA OLE and other NOAA offices, and prosecutes cases.

NMFS is mandated to implement ACLs and AMs annually for each stock or stock complex of MUS identified in an FEP. Federal regulations require both commercial and non-commercial bottomfish fishermen in Hawaii to obtain a Federal permit and report all catch (50 CFR 665). NMFS accepts the Hawaii CML in lieu of a Federal permit and has established a non-commercial permit that must be carried while fishing for BMUS in Federal waters. All reported catch from commercial and non-commercial fishing, and in State or Federal waters is counted toward an ACL, when an ACL is specified. Regardless of whether an ACL is specified or not, commercial uku catches are monitored using data from the State of Hawaii commercial fishing report system and reported in annual reports from the Council (e.g., WPFMC 2018a). Catch data is monitored in-season on a monthly basis, and post-season on an annual basis.

To prevent and minimize adverse bottomfish fishing impacts to EFH, each western Pacific FEP prohibits the use of explosives, poisons, bottom trawl and other non-selective and destructive fishing gear. State laws governing the bottomfish fishery in the MHI include CMLs, reporting requirements, and the implementation of BRFAs. Federal law also requires the Council-appointed Hawaii FEP plan team to prepare an annual report on the performance of all Federal fisheries, including MHI bottomfish fisheries by June 30 of each year. The report must contain, among other things, recommendations for Council action and an assessment of the urgency and effects of such actions.

3.6 Resources Eliminated from Detailed Study

The proposed action and potential alternatives would not affect resources of scientific, historic, cultural, or ecological importance in the MHI, other than those described above. Boats in the uku fishery are also local and do not have the potential for introducing or spreading non-native species. Uku are not part of a subsistence fishery. The uku fishery does not affect any subsistence harvest or gathering. These topics will not be considered further in this EA.

4 ENVIRONMENTAL EFFECTS OF THE ALTERNATIVES

This section describes the potential effects of each Alternative on the components of the affected environment or other socio-economic elements identified in Section 3 above.

4.1 Potential Effects on the Uku fishery

4.1.1 Alternative 1: *(no action)* no ACL or AM

Under Alternative 1, we expect the fishery would continue in the manner in which it was conducted in recent years. Not implementing an ACL or AMs is not expected to result in large changes to the conduct of the fishery, including gear types used, areas fished, level of catch or effort, participation, seasonality, or effects on target and non-target stocks or protected species. This continuity is expected because catches of uku have not been constrained by accountability

measures even though they have applied since uku has been managed as a single species. Since there has not been an in-season accountability measure such as a fishery closure as part of management of the non-Deep 7 bottomfish fishery, annual catch was a result of fishery dynamics If the combined commercial and non-commercial fishery were to catch the 2010-2020 average of 221,192 lb, the fishery would be sustainable. However, total catch in 2012 exceeded the OFL, although at that time, non-commercial catch was not included in management. Catch at the level of the OFL does not take into account scientific uncertainties identified in the P* process, and so does not ensure long-term sustainability of the fishery resource. Though the fishery is unlikely to sustain catches at this level based on recent history, this alternative does not include management prevent impacts to the fishery as required by the Magnuson-Stevens Act, implementing regulations, and the Hawaii FEP.

4.1.2 Alternative 2: *(no action – status quo/baseline)* commercial-only ACL of 127,205 lb and AMs

Under Alternative 2, the commercial-only fishery would be limited to a catch of up to 127,205 lb of uku per year. The commercial fishery is unlikely to reach the ACL of 127,205 lb if fishery performance is similar to the average of recent years, but may reach the ACL if commercial fishery performance is similar to the recent high year in 2017 (Table 3). If this occurred during the 2022-2025 management period, NMFS would close the fishery in Federal waters. Based on recent catch history, if the uku fishery did close, it would not be until near the end of the fishing year, and effects on the fishery are expected to be minimal. The State of Hawaii does not currently have the ability to implement a complementary fishery closure, so in the event of a Federal closure some fishermen may move to fishing for uku in State waters, or switch to targeting other species such as Deep 7 bottomfish that are in high demand late in the year for holiday celebrations (NMFS 2018). Catch of uku in State waters would be monitored through the State CML system, and any catch considered in the post-season evaluation to determine if an overage adjustment is needed. If commercial catch were to exceed 127,205 lb in 2021 when there is no in-season AM, average catch would still be evaluated as part of the post-season AM. An overage adjustment would be based on the average of the most recent three years of commercial catch, and no recent three-year period average catch has exceeded the ACL. Based on this history, NMFS concludes that it is unlikely that this AM would be triggered.

4.1.3 Alternative 3: combined commercial and non-commercial ACL of 295,419 lb with post season AM

Under Alternative 3, the combined commercial and non-commercial fishery would be limited to a catch of 295,419 lb. As with Alternative 2, catch would not reach the ACL if fishery performance is similar to the average of recent years, but may reach this level if total fishery performance is similar to the recent high in 2012 (Table 3). For this alternative, no in-season AM is proposed, so in-season closures would not occur. For the same reasons detailed in Alternative 2, a post-season overage adjustment is unlikely to be needed as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL.

4.1.4 Alternative 4: combined commercial and non-commercial ACL of 295,419 lb with both in-season and post-season AM

In addition to the ACL proposed in Alternative 3, Alternative 4 would include an in-season AM relative to the ACL of 295,419 lb. Given combined fishery performance since 2010, we anticipate reaching the ACL one or more times in the 2022-2025 management period with a probability of approximately one in three, although total fishery catches have shown marked declines in the last three years. Based on recent catch history, if the uku fishery did close, it would not be until near the end of the fishing year, and effects on the fishery are expected to be minimal. As described for Alterative 2, State waters would not be closed if total fishery catch was projected to reach the ACL. For the same reasons detailed in Alternative 2, a post-season overage adjustment is unlikely to be needed as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL.

4.1.5 Alternative 5: (*preferred alternative*) combined commercial and non-commercial ACL of 295,419 lb, ACT of 291,010 lb, with both in-season and post-season AMs

Alternative 5 shares the same ACL as Alternatives 3 and 4, and would include an in-season AM relative to an ACT of 291,010 lb to address uncertainty in non-commercial catch. As for Alternative 4, we anticipate reaching the ACT one or more times in the 2022-2025 management period with about a one in three chance, although total fishery catches in the most recent years suggest the probability of reaching the ACT may be lower. Based on recent catch history, if the uku fishery did close, it would not be until near the end of the fishing year, and effects on the fishery are expected to be minimal. As described for Alterative 2, State waters would not be closed if total fishery catch was projected to reach the ACL. For the same reasons detailed in Alternative 2, a post-season overage adjustment is unlikely to be needed as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL.

4.1.6 Alternative 6: combined commercial and non-commercial ACL of 286,601 lb, ACT of 282,192 lb, with both in-season and post-season AM

Alternative 6 differs from Alternative 5 only with respect to a more conservative ACL and ACT. As for Alternative 4 & 5, we anticipate reaching the more conservative ACT of Alternative 6 one or more times in the 2022-2025 management period with a probability of approximately one in three, although total fishery catches in the most recent years suggest the probability of reaching the ACT may be lower. Based on recent catch history, if the uku fishery did close, it would not be until near the end of the fishing year, and effects on the fishery are expected to be minimal. As described for Alterative 2, State waters would not be closed if total fishery catch was projected to reach the ACT. For the same reasons detailed in Alternative 2, a post-season overage adjustment is unlikely to be needed as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL.

4.2 Potential Effects on Physical Resources

There are no known significant impacts to air quality, noise, water quality, view planes, or terrestrial resources from past or current bottomfish fishing activity. Fishing behavior and effort (Section 3.1) are not expected to change under any alternative in a manner that would result in

effects on physical resources. Therefore, given the characteristics of the vessels in the fishery and the offshore nature of the fishing activity, none of the alternatives would result in impacts to air quality, noise, water quality, view planes, or terrestrial resources. The fishery is not having an adverse effect on unique features of the geographic environment, and none of the action alternatives would result in adverse effects on such resources as marine protected areas (see section 4.3.3).

4.3 Potential Effects on Biological Resources

4.3.1 Target, Non-Target and Bycatch Species

4.3.1.1 Alternative 1: *(no action)* no ACL or AM

Target species

Under this no action alternative, NMFS would not implement an ACL or AM for uku in the MHI. However, NMFS and the Council would continue to monitor catches based on all available sources of information. Under this Alternative, the fishery operating in the absence of an ACL or AMs in calendar years 2022, 2023, 2024 or 2025 would not be likely to exceed the OFL, but may exceed catch levels that ensure sustainability by considering scientific and management uncertainty. As discussed in section 20 and section 4.1.1, reported total catches of uku were not constrained by management recent years and have, except for 2012, remained below the estimated OFL of 302,033 lb. The lack of an ACL and AMs under Alternative 1 would not provide NMFS and the Council with the ability to prevent overfishing and ensure the long-term sustainability of the MHI uku stock should fishing effort increase.

Non-target and bycatch species

The depth range of uku overlaps with Deep 7 BMUS such as opakapaka (NMFS 2016), so incidental catch of these fish could occur from uku fishing. MHI Deep 7 bottomfish are managed under an ACL and AMs that include an in-season closure and potential overage adjustments to the ACL in subsequent years. When the MHI Deep 7 bottomfish fishery closed in the past, fishermen tended to target uku; however, the Deep 7 fishery is unlikely to be closed given that catches over the last ten years have averaged just over half of the proposed ACL of 492,000 lb. Any Deep 7 bottomfish reported from uku fishing would be applied to the ACL implemented by NMFS for that species complex, and would not result in effects to the stock that are not already accounted for by the most recent stock assessment (Langseth et al. 2018) and the EA (NMFS 2019a) supporting the implementation of the Deep 7 bottomfish ACL. This stock is healthy and would not be affected by uku fishing under this Alternative.

Bycatch in the uku fishery is very low, averaging less than 1.3% of total catch by number of fish over the past 10 years (WCPFC 2020). Under this alternative, fishery effects on non-target stocks are expected to continue at low levels. Some ECS (such as white ulua and kahala) are incidentally caught while fishing for uku. However, non-target ECS are generally not retained. Electronic navigation and fish-finding equipment greatly aid fishermen in returning to a particular fishing spot and catching desired species with little incidental catch (Haight, Kobayashi, and Kawamoto 1993). Most bycatch species are also relatively shallow water species and/or those that do not

experience severe effects of barotrauma (Kawamoto and Gonzales 2005), are known to be ciguatoxic, and have little or no market value (i.e., kahala, butaguchi and white ulua) or are sharks which are released alive.

It is not expected that fishing for uku under Alternative 1 would change given recent catch history, or that the fishery would have an adverse effect on non-target or bycatch species. Ongoing fisheries monitoring by NMFS and the Council would help fishery scientists and managers to detect any increase in non-target catch or bycatch and address any potential concerns in future management measures as needed. For these reasons, even without ACL or AM management, the expected effects of Alternative 1 on target and non-target stocks would be minor and catches are expected to remain similar to levels in recent years. Target and non-target stocks are expected to remain healthy under Alternative 1, though this alternative does not provide management measures to ensure the sustainability of the uku fishery.

4.3.1.2 Alternative 2: *(no action – status quo/baseline)* commercial-only ACL of 127,205 lb and AMs

Target species

Under Alternative 2, NMFS and the Council would continue to monitor uku catch based on all available sources of information. If fishery performance is similar to recent years (Table 3) there is a small chance commercial catch could reach the ACL proposed under this alternative (127,205 b) in-season and the commercial fishery be closed in Federal waters, although catches in the most recent three years have been well below the ACL. In this case, non-commercial fisheries would be closed in Federal waters as well. If this occurred, it would likely occur at the end of the year and have minor fishery impacts. If the fishery closed in-season, some fishermen may target uku in State waters, but any commercial catch in State waters would be reported through the same CML system used to track uku catch throughout the MHI. Non-commercial uku catch in State waters would be estimated by the HMRFS and MRIP surveys. In the event that the fishery does not close in time and the commercial catch exceeds the ACL, it is still very unlikely that three-year average commercial catch would exceed 127,205 lb, although an adjustment by the amount of the overage would be applied to the following year's ACL if that were the case. No set of three consecutive years of commercial fishery catch have reached this ACL on an average basis in recent decades. Under this alternative, the combination of ACLs and AMs would prevent impacts on stocks of uku and ensure the fishery remains sustainable.

Non-target and bycatch species

Similar to Alternative 1, the uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternative 2. In the event that the uku fishery did close, some fishermen may switch to targeting Deep 7 BMUS. Any incidental commercial catch of Deep 7 bottomfish during uku fishing would be reported and applied towards the ACL for that species complex. The Deep 7 fishery catches are well below the ACL and OFL (Langseth et al. 2018; NMFS 2019a), so a closure of the uku fishery would not affect the sustainability of this fishery. Bycatch of non-target stocks is in both commercial and non-commercial fisheries are expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (e.g., kahala, butaguchi and white ulua), or sharks which are released alive.

In summary, Alternative 2 is not likely to result in significant changes in the conduct of the fishery, including gear types used, areas fished, and level of catch, which would result in adverse effects on target or non-target stocks or bycatch species, and the commercial fishery would be managed and harvests limited through the ACL and AMs. Any in-season closure based on commercial catch reaching the ACL would reduce non-commercial catch as well, with closure of Federal waters to all uku retention. Therefore, under this alternative, harvest of uku in the MHI would continue to be sustainable, and the uku stock is not expected to be subject to overfishing or become overfished.

4.3.1.3 Alternative 3: combined commercial and non-commercial ACL of 295,419 lb with post season AM

Target species

Under Alternative 3, the combined commercial and non-commercial fishery would be limited to a catch of 295,419 lb. This ACL is associated with a 41% chance of overfishing. Total catch would be unlikely to reach the ACL if fishery performance is similar to the average of recent years, but may reach this level if total fishery performance is similar to the recent high in 2017 (Table 3). For this alternative, no in-season AM is proposed, so in-season closures would not occur. A post-season overage adjustment is unlikely to be needed as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL. Alternative 3 is not expected to change the commercial or non-commercial fishery significantly in a way that would adversely affect the uku stock and thus the fishery would be expected to remain sustainable.

Non-target species and bycatch

The combined commercial and non-commercial uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternative 3. Incidental catch of Deep 7 BMUS and other bycatch species during commercial uku fishing would be monitored through the State CML program and HMRFS and MRIP surveys for the non-commercial fishery. Bycatch of non-target stocks in both fisheries is expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi and white ulua), or sharks which are released alive.

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Alternative 3 is not likely to result in significant changes in the conduct of the fishery, including gear types used, areas fished, or have large adverse effects on target or non-target stocks or bycatch species. Under this alternative, both commercial and non-commercial harvest of uku in the MHI would be monitored relative to the ACL and continue to be sustainable, and the stock is not expected to be subject to overfishing or become overfished.

4.3.1.4 Alternative 4: combined commercial and non-commercial ACL of 295,419 lb with both in-season and post-season AM

Target species

Like Alternative 3, under Alternative 4 the combined commercial and non-commercial fishery would be limited to a catch of 295,419 lb. This ACL is associated with a 41% chance of

overfishing. Total catch would be unlikely to reach the ACL if fishery performance is similar to the average of recent years, but may reach this level if total fishery performance is similar to the recent high in 2017 (Table 3). For Alternative 4, in-season closures are possible and, based on recent fishing history, are expected to occur with a probability of one in three, although total catches in have not exceeded the ACL under this alternative since 2012 (Table 3). If an in-season closure occurred, it would likely occur at the end of the year and have minor fishery impacts. If closed in-season, some fishermen may target uku in State waters, but any commercial catch in State waters would be reported through the same CML system used to track uku catch throughout the MHI and non-commercial uku catch in State waters would be estimated by the HMRFS and MRIP surveys. A post-season overage adjustment is unlikely to be needed as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL. Alternative 4 is not expected to change the commercial or non-commercial fishery significantly in a way that would adversely affect the uku stock and the fishery would be expected to remain sustainable.

Non-target species and bycatch

The combined commercial and non-commercial uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternative 4. Incidental catch of Deep 7 BMUS during commercial uku fishing would be monitored through the State CML program and HMRFS and MRIP surveys for the non-commercial fishery. Bycatch of non-target stocks in both fisheries is expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi and white ulua), or sharks which are released alive.

In summary, Alternative 4 is not likely to result in significant changes in the conduct of the fishery, including gear types used, areas fished, and level of catch, which would result in adverse effects on target or non-target stocks or bycatch species, and both the commercial and non-commercial fishery would be managed and harvests limited through the ACL and AMs. Any in-season closure based on total catch reaching the ACL would reduce both commercial and non-commercial catch, with closure of Federal waters to all uku retention. Therefore, under this alternative, harvest of uku in the MHI would continue to be sustainable, and the uku stock is not expected to be subject to overfishing or become overfished.

4.3.1.5 Alternative 5: (***preferred alternative***) combined commercial and non-commercial ACL of 295,419 lb, ACT of 291,010 lb, with both in-season and post-season AMs

Target species

Like Alternatives 3 and 4, the combined commercial and non-commercial fishery would be limited to a catch of 295,419 lb under preferred Alternative 5. In addition, this alternative would include an ACT of 291,010 lb relative to in-season catch to reduce the likelihood of exceeding the ACT due to uncertainty in non-commercial catch estimates. Total catch would be unlikely to reach the ACT if fishery performance is similar to the average of recent years, but may reach this level if total fishery performance is similar to the recent high in 2017 (Table 3). For Alternative 5, in-season closures are possible and, based on recent fishing history, are expected to occur with a probability of one in three, although total catches in have not exceeded the ACT under this

alternative since 2012 (Table 3). With specification of an ACT, this alternative is less likely to have in-season closures than Alternative 4. If an in-season closure occurred, it would likely occur at the end of the year and have minor fishery impacts. If closed in-season, some fishermen may target uku in State waters, but any commercial catch in State waters would be reported through the same CML system used to track uku catch throughout the MHI and non-commercial uku catch in State waters would be estimated by the HMRFS and MRIP surveys. A post-season overage adjustment is unlikely to be needed as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL. Alternative 5 is not expected to change the commercial or non-commercial fishery significantly in a way that would adversely affect the uku stock and the fishery would be expected to remain sustainable.

Non-target species and bycatch

The combined commercial and non-commercial uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternative 5. Like other alternatives, incidental catch of Deep 7 BMUS and other bycatch species during commercial uku fishing would be monitored through the State CML program and HMRFS and MRIP surveys for the non-commercial fishery. Bycatch of non-target stocks in both fisheries is expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi and white ulua), or sharks which are released alive.

In summary, Alternative 5 is not likely to result in significant changes in the conduct of the fishery, including gear types used, areas fished, and level of catch, which would result in adverse effects on target or non-target stocks or bycatch species, and both the commercial and non-commercial fishery would be managed and harvests limited through the ACL, ACT and AMs. Any in-season closure based on total catch reaching the ACT would reduce both commercial and non-commercial catch, with closure of Federal waters to all uku retention. Therefore, under this alternative, harvest of uku in the MHI would continue to be sustainable, and the uku stock is not expected to be subject to overfishing or become overfished.

4.3.1.6 Alternative 6: combined commercial and non-commercial ACL of 286,601 lb, ACT of 282,192 lb, with both in-season and post-season AMs

Target species

Alternative 6 would limit the combined commercial and non-commercial fishery to a catch of 286,601 lb with a more conservative ACT of 282,192 lb. Total catch would be unlikely to reach this more conservative ACT if fishery performance is similar to the average of recent years, but may reach this level if total fishery performance is similar to the recent high in 2017 (Table 3). If an in-season closure occurred, it would likely occur at the end of the year and have minor fishery impacts. If closed in-season, some fishermen may target uku in State waters, but any commercial catch in State waters would be reported through the same CML system used to track uku catch throughout the MHI and non-commercial uku catch in State waters would be estimated by the HMRFS and MRIP surveys. A post-season overage adjustment is unlikely to be needed under Alternative 6 as recent three-year average combined commercial and non-commercial catch has not exceeded the ACL. Alternative 6 is not expected to change the commercial or non-

commercial fishery significantly in a way that would adversely affect the uku stock and the fishery would be expected to remain sustainable.

Non-target species and bycatch

As was the case for previous alternatives, the combined commercial and non-commercial uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternative 6. Like other alternatives, incidental catch of Deep 7 BMUS and other bycatch species during commercial uku fishing would be monitored through the State CML program and HMRFS and MRIP surveys for the non-commercial fishery. Bycatch of non-target stocks in both fisheries is expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi and white ulua), or sharks which are released alive.

In summary, Alternative 6 is not likely to result in significant changes in the conduct of the fishery, including gear types used, areas fished, and level of catch, which would result in adverse effects on target or non-target stocks or bycatch species, and both the commercial and non-commercial fishery would be managed and harvests limited through the ACL, ACT and AMs. Any in-season closure based on total catch reaching the ACT would reduce both commercial and non-commercial catch, with closure of Federal waters to all uku retention. Therefore, under this alternative, harvest of uku in the MHI would continue to be sustainable, and the uku stock is not expected to be subject to overfishing or become overfished.

4.3.2 Protected Species

A number of protected species are documented as occurring in the waters around the Hawaiian Islands and there is the potential for interactions with the MHI uku fishery. This fishery been evaluated for impacts on protected resources and is managed in compliance with the requirements of the Magnuson-Stevens Act, the MMPA, the ESA, the Migratory Bird Treaty Act, and other applicable statutes. Section 3.3.2 of the 2020 EA (NMFS 2020), "Protected Species," describes the baseline with respect to recent and projected interactions between the uku fishery operating under the baseline. The fishery is known to have a low level of interactions with protected species incidental to fishing including with marine mammals, sea turtles, seabirds, sharks, and rays (2020 EA, section 4.3.2) and the information from the 2020 EA is incorporated by reference.

On February 1, 2019 NMFS SFD requested reinitiation of formal consultation under section 7(a)(2) of the ESA for the MHI bottomfish fishery in response to the listing of the oceanic whitetip shark and giant manta ray as threatened, and the designation of critical habitat for the MHI IFKW DPS, and on June 5, 2019, NMFS Protected Resources Division reinitiated consultation. Also, on February 1, 2019, and again on July 9, 2021, NMFS SFD determined that the conduct of the Hawaii bottomfish fisheries during the period of consultation will not violate ESA Section 7(a)(2) and 7(d) with respect to these listings.

As of the drafting of this EA, PIRO Protected Resources Division is continuing to evaluate information relevant to the consultation. The proposed action under consideration would not change the manner in which the fishery operates with respect areas fished, gear used, or methods

employed, so interactions with the protected are not anticipated to change in frequency or intensity from those analyzed in the 2020 EA. The MKI uku fishery will continue to not likely to adversely affect with oceanic whitetip sharks and giant manta rays, or critical habitat of the MHI IFKW DPS.

4.3.2.1 Species protected under the Endangered Species Act (ESA)

Green Sea Turtles

In a 2008 BiOp prepared for the bottomfish fishery (NMFS 2008), NMFS determined that except for the Hawaiian green sea turtle, bottomfish fishing activities are not likely to adversely affect any ESA-listed marine species that may be found in Federal waters of the MHI, or result in the destruction or adverse modification of critical habitat. For green sea turtles, NMFS determined the bottomfish fishery is likely to adversely affect, but not likely to jeopardize the green sea turtles in Hawaii. An incidental take statement estimated up to 2 turtles per year may be killed during vessel transit.

Although the 2008 BiOp estimated vessel strikes based on the number of vessels registered with the State of Hawaii for the Deep 7 bottomfish fishery, these results are analogous to the uku fishery given similarity in fishing methods, vessels, and gear. The BiOp evaluated the effects of 71,800 bottomfish fishing trips per year on green sea turtles in Hawaii, and estimated the likely number of strikes of green sea turtles during these trips. The average number of commercial fishing trips for Deep 7 from 2008–2020 was 2,679, while the number of non-Deep 7 trips was 1,609 (WPFMC 2020). The average number of trips since ACLs were first implemented for non-Deep 7 bottomfish (2012-2020) is 1,593, and the highest number of trips is 1,915 in 2016 (Table 17). Respectively, this equates to 2.22% and 2.67% of the trips used to evaluate effects on green sea turtles in the 2008 BiOp, so commercial bottomfish fisheries in Hawaii, and the uku fishery in particular, are operating at considerably lower levels than NMFS used to analyze effects of bottomfish fishing on green sea turtles. Even adding the 14,000 non-commercial trips targeting snapper species estimated for 2015 suggests that combined commercial and non-commercial uku fisheries are much lower than analyzed in the 2008 BiOp. In 2016 the population of green sea turtles in Hawaii was designated as a DPS (81 FR 20057). The 2008 BiOp evaluated the Hawaii population of green sea turtles (now the Central North Pacific DPS) as a unit rather than evaluating effects of the MHI bottomfish fishery on the range-wide population of green sea turtles, and the findings of the BiOp remain applicable.

Under all of the alternatives presented here, we expect the uku commercial and non-commercial fisheries would continue to operate as they have in recent years, including with respect to effort, intensity and areas fished. The commercial fishery operating at this level was analyzed as described above and NMFS determined that the bottomfish fishery is not likely to jeopardize the existence of green sea turtles. This analysis indicates that even absent ACLs and AMs, the uku fishery would not jeopardize the population of green sea turtles in Hawaii. In the unlikely event that the fishery was closed as an in-season AM under Alternatives 2, 4, 5 or 6, fishing activity may shift to another fishery such as the MHI Deep 7 bottomfish fishery, which was analyzed under the 2008 BiOp. This fishery is also operating well below the level of fishing effort that the BiOp analyzed, so this level of effort has been accounted for in existing analyses, and under all

alternatives considered, the proposed action is not expected to have a substantial effect on the overall population size of green sea turtles in Hawaii, and is not likely to reduce appreciably the likelihood of both survival and recovery of the species in the wild. For this reason, we have determined the proposal is not likely to have significant impacts to green sea turtles.

Insular False Killer Whales

In 2013, NMFS re-initiated consultation under ESA in response to listing of MHI insular false killer whale distinct population segment (MHI IFKW DPS) under the ESA (NMFS 2013b). In a modification to the 2008 BiOp dated August 7, 2013, NMFS determined that bottomfish fisheries in the MHI are not likely to adversely affect MHI IFKW.

On July 24, 2018 NMFS designated critical habitat for IFKW (83 FR 35062). Most prey species taken by MHI IFKW are pelagic fishes or squid, though kahala and unidentified jacks that may be caught incidentally while uku fishing have been identified as prey as well. Also, in its biological report for the designation of IFKW critical habitat, NMFS concluded that "because these prey species represent an insignificant fraction of total bottomfish fishery harvests, adverse impacts to MHI IFKW critical habitat are not expected" (NMFS 2018). Additionally, these species are frequently not retained due to concerns with ciguatera toxicity.

We expect the uku fishery to continue to operate as it has in recent years with respect to fishing effort and species caught across all of the alternatives considered in this environmental assessment. Under Alternatives 2, 4, 5 and 6, that include in-season AMs, there is a low potential that the uku fishery may be closed in Federal waters within the fishing year, although we expect closures to only occur late in the fishing year and are not expected to significantly change the fishery. The fishery operating as it has in recent years was analyzed as described above, and NMFS determined that the proposed action may affect, but is not likely to adversely modify, MHI IFKW DPS critical habitat (NMFS 2019c). This analysis indicates that across all alternatives, the uku fishery would not be expected to have significant impacts on populations of IFKW prey species that are considered part of IFKW critical habitat. NMFS and the Council will continue to monitor catches of these IFKW prey species, so that data will be available for future consideration. Under all alternatives considered, the proposed action is not expected to have a substantial effect on the overall population size or critical habitat of MHI IFKW DPS, and is not likely to reduce appreciably the likelihood of both survival and recovery of the species in the wild.. For this reason, we have determined the proposed action is not likely to have significant impacts to the MHI IFKW DPS or their critical habitat.

On February 1, 2019, NMFS reinitiated informal consultation under ESA to seek concurrence with its conclusion that bottomfish fishing activities are not likely to adversely affect critical habitat of the MHI IFKW DPS, as required by 50 CFR 402.16. Also, on February 1, 2019, and again on July 9, 2021, NMFS SFD determined that the conduct of the Hawaii bottomfish fisheries during the period of consultation will not violate ESA Section 7(a)(2) and 7(d) with respect to these listings.

Monk Seals

In the 2008 BiOp prepared for the fishery (NMFS 2008), NMFS determined that bottomfish fishing activities are not likely to adversely affect the Hawaiian monk seal because the predicted rate of hooking that would result in serious injury or mortality was 1 event every 67 years.

On August 21, 2015, (80 FR 50925) NMFS published a final rule to designate areas in the MHI as monk seal critical habitat. Gear typically used in the bottomfish and uku fisheries is unlikely to cause discernable changes to bottom structure within monk seal critical habitat. Monk seals are foraging generalists, and fish species caught while bottomfish fishing are unimportant in monk seal diets (Sprague, Littnan, and Walters 2013). It is therefore unlikely the MHI uku fishery will have a discernable overall effect on monk seal forage items. In a memo dated March 1, 2016, consultation concluded with NMFS concurrence with a finding that the bottomfish fishery is not likely to adversely affect Hawaiian monk seal critical habitat, because the fishery does not affect monk seal haul-out, pupping or nursing habitat; does not affect prey species available to monk seals; and does not have physical effects on monk seal critical habitat. Effects of the fishery are therefore expected to be discountable or insignificant.

ACLs for the MHI non-Deep 7 bottomfish fishery during years 2015 and 2016, which immediately preceded the preparation of the March 1, 2016 memo, were 178,000 lb. Considering that approximately 80% to 90% of non-Deep 7 catch was uku, this level of catch (142,000–160,000 lb) would be greater than that has been caught in the uku commercial fishery in recent years. This level of commercial catch is greater than expected under any of the alternatives examined here. Therefore, under all alternatives considered, the proposed action is not expected to have a substantial effect on the overall population size or critical habitat of monk seals, and is not likely to reduce appreciably the likelihood of both survival and recovery of the species in the wild. For this reason, we have determined the proposed action is not likely to have significant impacts to monk seals.

Listed Sharks and Rays

In January 2018, NMFS published a final rule listing oceanic whitetip sharks and giant manta rays as threatened species under the ESA (January 30, 2018, 83 FR 4153 and January 22, 2018, 83 FR 2916, respectively). NMFS has not proposed critical habitat or protective regulations for either species under ESA Section 4(d) at this time.

Based on commercial and non-commercial logbooks and voluntary reports, Hawaii bottomfish fishermen have documented interactions with oceanic whitetip sharks; however, from 2000–2017 interactions have been infrequent (0.236 per year) and there are questions about species identification so the actual number may be lower. This interaction rate equates to an interaction with 0.0002% of the WCPO population, based on population estimates from Young et al. (2016). NMFS determined that the proposed action may affect and is likely to adversely affect the oceanic whitetip shark (NMFS 2019c). On February 1, 2019, NMFS reinitiated formal consultation under ESA to determine whether bottomfish fishing activities are likely to jeopardize the continued existence of this species, as required by 50 CFR 402.16. Also, on February 1, 2019, and again on July 9, 2021, NMFS SFD determined that the conduct of the Hawaii bottomfish fisheries during

the period of consultation will not violate ESA Section 7(a)(2) and 7(d) with respect to these listings.

Hawaii bottomfish fisheries do not target giant manta rays for meat or gill rakers, and there are no records of giant manta ray incidental captures or entanglements. Giant manta rays feed on plankton (Miller and Klimovich 2017), making it highly improbable that the rays would attempt to prey on fish-baited hooks used in these fisheries, or become entangled in fishing gear. Similarly, there are no reported or observed collisions with giant manta rays and bottomfish fishing vessels in any island area. On February 1, 2019, NMFS reinitiated informal consultation under ESA to seek concurrence with this conclusion, as required by 50 CFR 402.16. Also, on February 1, 2019, and again on July 9, 2021, NMFS SFD determined that the conduct of the Hawaii bottomfish fisheries during the period of consultation will not violate ESA Section 7(a)(2) and 7(d) with respect to these listings.

Under all alternatives considered here, we expect the commercial and non-commercial uku fishery would not change the manner in which they operate with respect areas fished, gear used, or methods employed, so an increase in the rate of interactions with the oceanic whitetip shark or giant manta ray are not anticipated. Under the action alternatives, fishing activity is expected to be similar to or less than the baseline alternative. The fishery operating at current levels was analyzed in a biological evaluation (NMFS 2019c), and NMFS determined that continued operation of the fishery would not have jeopardize populations of oceanic whitetip sharks or giant manta rays during the period of consultation (NMFS 2019b; NMFS 2021). Therefore, fishing under all alternatives is not expected to have a significant effect on the overall population size of either the oceanic whitetip shark or the giant manta ray.

On April 15, 2021 NMFS announced a 90-day finding on a petition to list the shortfin mako shark (*Isurus oxyrinchus*) as threatened or endangered under the ESA and to designate critical habitat concurrent with the listing, so NMFS is initiating a status review of the species to determine whether listing under the ESA is warranted (86 FR 19863). The shortfin mako is a large pelagic shark that occurs across all temperate and tropical ocean waters. Previously, NMFS determined that the shortfin mako shark in the North Pacific Ocean was not overfished or experiencing overfishing based on a 2018 stock assessment (ISC 2018). As a pelagic shark, the shortfin mako is not known to interact with MHI uku fisheries, and it was not discussed in the 2020 EA. The alternatives under consideration are not expected to change the fishery in any way, and would not be expected to change the level of interactions with the shortfin mako shark (86 FR 19863) in response to a petition. If the short fin mako shark is listed, NMFS would consult as required under section 7 of the ESA to determine the effects of the fishery on this species.

4.3.2.2 Species protected under the Marine Mammal Protection Act (MMPA)

On January 14, 2021 (86 FR 3028), NMFS published the final List of Fisheries (LOF) for 2021, which classified the Hawaii bottomfish handline fishery as a Category III fishery under Section 118 of the MMPA. Because non-commercial fisheries are not included in the LOF and use a variety of gear types (Section 3.1), we note that other Hawaii-based commercial fisheries using gears consistent with the non-commercial fishery are also classed as Category III: Hawaii inshore handline, Hawaii pelagic handline, Hawaii troll, and Hawaii rod and reel. A Category III fishery is one with a remote likelihood or no known incidental morality and serious injury of marine

mammals. Under all alternatives considered here, NMFS does not expect changes to the conduct of the uku fisheries, including gear types used, areas fished, level of catch or effort, target and non-target stocks, or protected species. Thus, none of the alternatives would be expected to result in changes in the fishery that would cause impacts to marine mammals not previously considered by the LOF classification. For these reasons, we do not expect significant impacts to marine mammals as a result of the proposed action or alternatives considered.

4.3.2.3 Seabirds of the Hawaiian Archipelago

Seabirds fly over and forage in the areas in which the MHI bottomfish fisheries operate, however, seabirds are unlikely to interact with bottomfish fisheries because of the methods used to deploy and retrieve fishing tackle. There have been no reports of interactions between the Hawaii bottomfish fisheries and seabirds. The commercial and non-commercial MHI uku fisheries are not expected to change under any considered alternatives with respect to gear types used, areas fished, level of catch or effort, or target and non-target stocks; therefore, it is unlikely that these fisheries would affect seabirds. Therefore, none of the alternatives would result in a significant impact to distribution, abundance, reproduction, or survival of ESA-listed seabirds.

4.3.3 Habitats and Vulnerable Ecosystems

4.3.3.1 Essential Fish Habitat

EFH is defined in the Magnuson-Stevens Act as those waters and substrate that are necessary for fish spawning, breeding, feeding, and growth to maturity. In addition to and as a subset of EFH, the Council described habitat areas of particular concern (HAPC) for bottomfish. To prevent and minimize adverse bottomfish fishing impacts to the environment, the Hawaii FEP prohibits the use of explosives, poisons, bottom trawl, and other non-selective and destructive fishing gear. Bottomfish fishing is prohibited in North Kahoolawe as part of the Kahoolawe Island Reserve. None of the alternatives under consideration would change these regulations. Additionally, research studies to date, including the use of a submersible to directly observe the bottom in low, medium, and high fishing activity areas, indicate that bottomfish fishing operations do not have adverse impacts to the habitat (Kelley and Moffit 2004; Kelley and Ikehara 2006).

Fishing activity under either of the no-action alternatives is not expected to change from recent years with respect to gear types used, areas fished, level of catch or effort, target and non-target stocks; therefore, it is unlikely that the fishery would affect EFH of uku or any other MUS under this alternative. Similarly, the uku fishery is not expected to change substantially under the any of the action alternatives, and fishing activity would be the same as the uku fishery in recent years. It is therefore expected that implementation of any alternative would not result in effects to EFH or HAPC of any MUS managed under the Hawaii FEP (section 3.3.3).

4.3.3.2 Marine Protected Areas

Bottomfish fishing is prohibited in the Kahoolawe Island Reserve, Papahānaumokuākea Marine National Monument, and in State of Hawaii MPAs where and/or when fishing is prohibited. These MPAs would not be affected by the proposed action, so adverse effects to them would be unlikely under all Alternatives under consideration.

Bottomfish fishing does occur in the Hawaiian Islands Humpback Whale National Marine Sanctuary. Although humpback whales are found within the action area and could interact with the bottomfish fishery, no reported or observed entanglements of humpback whales by bottomfish fishing gear have occurred in the history of the fishery (NMFS 2008, NMFS unpublished data). None of the proposed alternatives would change the way bottomfish fishing is conducted with respect to these MPAs, so continued operation of the uku fishery under the baseline or action alternatives would not result in adverse impacts to the Sanctuary or other MPAs.

4.3.3.3 Vulnerable Marine or Coastal Ecosystems

Precious coral beds in the action area are located off the southern shore of Kauai, Oahu (Makapuu and Kaena point), Maui (Auau Channel), Hawaii Island (Keahole point and between Milolii and South Point) (NMFS 2013a). Known beds of deepwater precious corals (pink, gold and bamboo) are found at Makapuu and Kaena point on Oahu and Keahole Point on Hawaii Island. These species are slow-growing and some colonies may live over 4,000 years (Roark et al. 2009) making them highly susceptible to accidental damage or exploitation. Exposure of precious corals to damage from bottomfish fishing activities is limited due to existing Federal regulations (e.g., use of trawls, poisons, explosives) that are not subject to change due to the proposed action.

In addition to overlapping deepwater precious coral habitat, the uku fishery operates in areas that include coral reef ecosystem habitat (e.g., areas shallower than 50 m). However, this fishery is not known to adversely affect habitat, as described above in the effects analysis for EFH. Studies of bottomfish habitat from submersibles have not found adverse impacts to habitat from bottomfish fishing activities (Kelley and Moffit 2004; Kelley and Ikehara 2006). Fishing activity under the all alternatives defined here is not expected to change from recent years; therefore, it is unlikely that the fishery would affect vulnerable marine ecosystems such as deep coral ecosystems under this alternative. None of the alternatives under consideration would change the way the fishery is conducted with respect to these areas, so no impacts are expected to these areas as a result of implementing ACLs, ACTs and AMs under any alternative.

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

4.4 Potential Effects on Socio-economic Setting

4.4.1 Fishing Communities

The affected fishing community includes fishermen, vendors, and consumers. The islands of Kauai, Niihau, Oahu, Maui, Molokai, Lanai and Hawaii are each considered fishing communities for the purposes of assessing the effects of the current proposed action. The fishery provides a local source of fresh fish for these communities, and uku fishing activities and uku consumption are not known to result in public health or safety issues. The MHI uku fishery provides fish for

sustenance, gifts to friends and family, and local markets. In turn, the fishery provides positive social, cultural, and economic benefits to fishermen, buyers, and fishing communities in Hawaii. The fishermen from these areas who fish for uku and bottomfish could be affected by the management measure, and the related community members that rely on uku would also be indirectly affected through the availability of uku in the short- and long-term for sale or consumption.

Under the no-action alternatives, fishing is not expected to change relative to recent years with respect to magnitude or location of fishing effort or catch, although a lack of catch limits provides less certainty that the fishery would be managed sustainably and long-term to ensure availability of uku for fishermen and markets. Given recent catch history in the fishery, it is possible on an annual basis the total fishery might exceed the catch level of 295,419 lb, which was recommended through the process required under the Magnuson-Stevens Act and the Hawaii FEP and designed to ensure catch limits reflect scientific and other uncertainty to ensure a sustainable fishery. Catches above this level could affect the long-term sustainability of the fishery, and compromise the support this fishery provides to fishing communities.

All of the considered action alternatives would provide for a fishery that is actively managed for sustainability, which would ensure long-term benefits to the fishing communities. The fishery is not expected to reach the ACLs/ATCs specified under the action alternatives and close often given recent catch history (Table 3), so fishing communities are unlikely to be affected by implementation of this preferred alternative. In the event that the fishery exceeded recent catch levels and a closure was needed, it would likely occur near the end of the year. Fishing at this time tends to switch to targeting Deep 7 bottomfish species to supply fish for holiday celebrations, so fishing communities would not be strongly affected if an in-season AM was triggered under Alternatives 2, 4, 5 or 6. Similarly, it is very unlikely that the three-year average catch would exceed the ACL given recent catch history under any of the action alternatives considered, so NMFS does not expect that an overage adjustment would be needed in any fishing year. In the long term, the use of AMs under all of the action alternatives would also ensure the fishery remains sustainable, so any short-term effect would be offset by the long-term benefit.

It is unlikely that implementation of Alternative 5, the preferred alternative, would be controversial. The Council developed the ACL in accordance with requirements of the Magnuson-Stevens Act and the Hawaii FEP. The basis for the ACL is a recent stock assessment (Nadon et al. 2020), determined to be best available scientific information by NMFS and the Council's SSC. The proposed ACL, ACT and AMs under Alternative 5 were discussed at public meetings during this process (section 1.7), and no comments were received that indicated effects would be highly controversial.

4.4.1.1 Fishery participants

Effects on Subsistence Harvest or Gathering

Although uku are caught for home consumption, they are not considered to be part of a subsistence fishery. The uku fishery does not affect subsistence harvest or gathering activities of other species. The fishery under any of the alternatives considered here would not affect subsistence harvest or gathering activities.

Effects on Safety at Sea

As it has been conducted historically, the uku fishery does not have notable concerns with safety at sea. No changes to the fishery are expected under the two no-action alternatives. Under the ACLs and ACTs proposed under the action alternatives, the fishery is unlikely to close until the end of the fishing year, so a "race to fish" would not occur as it might in a fishery severely constrained by an ACL/ACT. The implementation of ACLs and ACTs under the action alternatives would not alter the fishery with respect to this concern. Because none of the proposed alternatives are expected to result in changes to the conduct of the MHI uku fishery, including gear types used, areas fished, or a race to fish, none of the proposed alternatives would result in safety issues or associated concerns for fishermen at sea.

4.4.1.2 Revenue

To estimate the impact of the Alternatives to the fishing community, economic analyses focused on the commercial component of the total catch as non-commercial fishery catches are not sold. In 2020, fishermen sold a total of 37,530 lb of uku at a value of $180,966, equating to an average estimated value of $5.05/lb (Table 18). On average over the last five years, fisherman caught 92,902 lb and sold 85,641 lb (92.2%) for $445,740.

Under Alternative 1, NMFS would not implement an ACL or AMs for uku in the MHI. Therefore, fishing would be unconstrained during the 2022 – 2025 management period and continue throughout the duration of each calendar year. NMFS expects that catch in these years would be comparable to observed catch levels in the most recent five years. Commercial catch at this level would provide $464,510 if fisherman sold all catch, or $445,740 if they sold 92% as they have on average recently (WPRFMC 2021). Although the average catch over the past five years has been 92,902 lb, and commercial catches have trended lower in recent years, it is possible catch could be similar to the maximum catch reported in recent years in the absence of an ACL (131,710 lb in 2017). Using the 2020 average price per pound of $4.82, the expected annual fleet-wide revenue from 2022-2025 under Alternative 1 is greater than $635,000 dollars if the fishery were to catch at recent maximum levels and sell all their catch, or $584,000 if they sold 92% of the catch.

With all of the other alternatives considered here, the uku fishery is expected to continue as it has in recent years, thus the expected commercial fishery revenue would equal that under Alternative 1, or approximately $446,000 annually. With ACLs, ACTs and AMs based on combined commercial and non-commercial fisheries, under the action alternatives (Alternatives 3 – 6) it is technically possible that commercial fisheries could obtain the maximum catch reported in recent years, thus have the same maximum potential revenue as Alternative 1, or $584,000. Under Alternative 2, with a commercial only ACT and in-season and post season AMs, commercial catches would be limited to 127,205 lb, and thus the maximum potential revenue would be 3.4% less, or $564,000

4.4.2 Scientific, Historic, Archaeological, or Cultural Resources

There are no known districts, sites, highways, structures or objects that are listed in or eligible for listing in the National Register of Historic Places within Federal waters of the MHI where

bottomfish fishing activities are conducted. Shipwrecks and other objects from the December 7, 1941 attack at Pearl Harbor could possibly occur in Federal waters around all of the islands. However, bottomfish fishing in the MHI is not known to result in adverse impacts to these resources, because commercial and non-commercial uku fishermen use light gear relative to other commercial fisheries and tend to avoid fishing in or anchoring on or near known shipwrecks in order to avoid losing gear.

There are no known fishing koa (traditional fishing grounds) in Federal waters in which the MHI uku fishery operates. Sites with unique scientific resources have not been identified in the MHI, apart from those protected by the State of Hawaii as MPAs. Fishing is generally restricted in these areas, including fishing for uku, so the uku fishery would not affect these resources. Under all alternatives considered here, operations of the uku fishery would not be expected to change from recent years, and thus would not have adverse effects on scientific, historic, cultural or archaeological resources.

4.5 Potential Effects on the Management Setting

4.5.1 Administrative and Regulatory Processes

The proposed action is a continuation of ongoing and coordinated management efforts to maintain a sustainable bottomfish fishery in the MHI through implementation of ACLs, ACTs and AMs is based on the best scientific information available. Under all Alternatives considered, the Council-appointed FEP plan team would continue to prepare an annual report on the performance of the MHI bottomfish fisheries, including the commercial and non-commercial fishing sector, by June 30 of each year. Additionally, all other regulations implemented by other Federal agencies and the State of Hawaii would continue to apply to bottomfish fishing vessels operating in the EEZ. The State would continue to manage uku catches through CMLs and reports, size limits, and areas closed to fishing. The State of Hawaii is considering implementing additional management measures for uku, including non-commercial bag limits, but it is unknown if these measures will apply during the 2022-2025 management period. Enforcement would be required to enforce regulations related to destructive fishing practices and licensing, and would remain the same as for recent years.

Under Alternative 1 and 3, NMFS would not implement in-season AMs for the uku fishery and thus administrative costs would be slightly lower relative to all other alternatives because: 1) without an in-season AM, NMFS would not need to monitor catch monthly, and 2) NMFS would not need implement or enforce a fishery closure in-season. All other alternatives (Alternatives 2, 4, 5 and 6) have in-season AMs and approximately the same likelihood that an in-season fishery would be required, thus administrative costs across these alternatives would be similar.

The MHI uku fishery, under all of the alternatives considered here, is unlikely to negatively impact either biodiversity or ecosystem function, as the uku stock continues to be healthy, the fishery would continue to have a low bycatch rate, and because the fishery does not have large and adverse effects on habitats or populations of other fishes as discussed previously (see Section 4.3.1). Also the uku fishery does not have known indirect effects on biodiversity (e.g., through impacts predator-prey relationships or ecosystem productivity) or ecosystem function.

If Alternatives 1 or 2 were enacted, their use would not establish a precedent for future actions with significant effects or represent a decision in principle about future consideration. NMFS is required under the Magnuson-Stevens Act to set ACLs for each fishery using the best scientific information available. Alternative 1 fails to set ACLs for the uku fishery, and Alternative 2 fails to account for the best scientific information available; thus neither could set a precedent. NMFS is able to adjust ACLs through subsequent rulemaking, so implementation of the baseline alternative does not narrow future options for management.

4.6 Other Potential Effects

4.6.1 Biodiversity and Ecosystem Function

Under all alternatives considered here, the fishery is expected to perform has it has in recent years, with the potential for late-season closures under some alternatives if fishing were to reach recent maximum catches. The MHI uku fishery is unlikely to negatively impact either biodiversity or ecosystem function, as the uku stock continues to be healthy, the fishery would continue to have a low bycatch rate, and because the fishery does not have large and adverse effects on habitats or populations of other fishes as discussed previously (see Section 4.3.1). Also the uku fishery does not have known indirect effects on biodiversity (e.g., through impacts predator-prey relationships or ecosystem productivity) or ecosystem function.

For all but Alternative 1, ACLs are lower than the most recent OFL estimate (302,033 lb) from the 2020 stock assessment (Nadon et al. 2020). The Council developed the proposed ACLs, ACTs, and AMs for all but Alternative 2, which follows the status quo based on the previous assessment (Nadon 2017) using the best available scientific information, in accordance with the fishery regulations, and after considering catches, participation trends, and estimates of the status of fishery resources. The ACLs, ATCs, and AMs are also not likely to cause large adverse impacts to marine resources because harvest levels are currently sustainable and uku fishing is not expected to change under any alternative. NMFS and the Council would continue to monitor catch of MUS and ECS, and would adapt management accordingly should new management needs become apparent.

Potential to introduce or spread of non-native species

Uku fishing is not known to be a potential vector for introducing or spreading new alien species, as this is a small-boat fishery and none of vessels fish outside of Hawaiian waters. Regardless of the action alternative selected, NMFS does not anticipate that the Federal action would result in changes in the conduct of the fishery in terms of gear types used, areas fished, and level of catch and effort as compared to baseline conditions. For this reason, none of the alternatives are expected to increase the potential for the spread of alien species into or within Hawaiian waters.

To date, there have been no identified impacts to marine biodiversity and/or ecosystem function from the MHI uku fishery and none of the alternatives under consideration are expected to change the way the fishery is conducted and result in impacts to these environmental features. The proposed ACLs, ACTs, and AMs would not result in changes to the MHI uku fishery and would not have large adverse impacts to marine biodiversity and/or ecosystem function.

4.6.2 Highly uncertain effects, unique or unknown risks

Given recent catch history in the fishery, it is unlikely that operation of the unconstrained uku fishery would risk effects to the human environment. However, of the alternatives under consideration, Alternative 1 involves the most uncertainty because the fishery would not be actively managed using ACLs and AMs to limit fishing activity to a sustainable level.

The proposed action is part of continued management of uku under a system of ACLs and AMs that was first used in 2012. The Council selected the ACL conservatively, based on BSIA in accordance with approved procedures and methods. The AMs offer additional assurance against uncertain effects, and were developed by fishery managers and scientists. Effects on the human environment of operation of the uku fishery and management of the uku fishery under ACLs and AMs are known and have been considered in the development and recommendation of management alternatives.

The ACL proposed under action Alternatives 3 through 6 has built in buffers to account for uncertainty. We do not anticipate that any of the proposed alternatives would have a risk of large unknown effects that could result in adverse cumulative effects. The Council and its SSC applied a qualitative method to develop the P* estimates. P* (risk of overfishing) was computed using the best scientific information available and including scientific uncertainty for four dimensions: 1) assessment information, 2) assessment uncertainty, 3) stock status, and 4) productivity and susceptibility (WPFMC and NMFS 2011). Building in this buffer reduces the potential for large adverse cumulative effects of the proposed ACLs and AMs on sustainability of the fishery.

The Council and its SSC also applied a qualitative analysis related to other concerns and management uncertainties considering four factors: 1) Social, 2) Economic; 3) Ecological, and 4) Management uncertainty (SEEM) considerations (WPFMC and NMFS 2011). This analysis did suggest minor management uncertainty, specifically uncertainty in non-commercial catch estimates, so the ACL is set lower than the ABC. In addition, specification of ACTs in Alternatives 5 and 6 provide additional buffer against uncertain effects. Consideration of the factors in the SEEM analysis reduces the potential for unexpected adverse effects of the proposed ACLs and AMs on sustainability of the fishery due to any of these factors.

4.6.3 Environmental Justice

The fishery for uku in Hawaii is not known to have a large adverse environmental effect on stocks of fish that may be caught by subsistence fisherman or on other marine resources that may be targeted for subsistence consumption. The fishery does not pollute marine waters and thus does not have adverse effects to human health or on marine life. NMFS and the Council manage fisheries through Federal regulations that are intended to conserve marine resources and habitats to enhance the economic and social well-being of fishing communities, including members of minority populations and low-income populations. None of the alternatives under consideration will change the manner in which the fishery operates. For these reasons, none of the alternatives would have the potential to have a disproportionately high and adverse human health or environmental effect on environmental justice populations; nor would the alternatives have an adverse effect on subsistence patterns of consumption.

4.7 Potential Cumulative Effects of the Alternatives

Cumulative effects refer to the combined effects on the human environment that result from the incremental impact of the proposed action, and its alternatives, when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Further, cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. The cumulative effects analysis examines whether the direct and indirect effects of the alternatives considered on a given resource could interact with the direct and indirect effects of other past, present and reasonably foreseeable actions on that same resource.

Past, present and reasonably foreseeable management actions for the MHI uku fishery that may relate to the proposed action include:

- Managing MHI non-Deep 7 bottomfish fishery since 2012 with catch limits and accountability measures intended to prevent the fishery from exceeding a catch limit (see Section 1.1 for relevant recent fishery management history);
- Ongoing monitoring of the fishery (monthly for commercial fisheries and every two months for non-commercial fisheries) and fishery closures if the fishery approaches or is expected to reach an ACL under Alternatives 2 and 4 or ACT under Alternatives 5 and 6 (see Section 1.1). Monitoring of the fishery would continue under all Alternatives, though in-season and post-season monitoring relative to an ACL or ACT would not be required under Alternatives 1 and 3. Monitoring under all alternatives would be used to inform required annual reports on Federal fishery performance.
- Other past management measures for the MHI non-Deep7 bottomfish fishery, and present measures for the uku fishery intended to allow monitoring and enforcement (see Section 1.1).
- Establishment and subsequent expansion of the Papahānaumokuākea Marine National Monument (Monument), which included a prohibition on commercial fishing. NMFS implemented regulations prohibiting commercial bottomfish fishing in the Monument in 2006 (71 FR 51134).
- Periodic stock status updates (e.g., Sabater and Kleiber 2014, Nadon 2017, Nadon et al. 2020). These periodic updates would continue regardless of the alternative selected.
- Annual review of the fishery performance by the SSC and the Council; including review of ACLs, ACTs, and AMs and any modifications that may be called for in light of new information. This annual review would not change under any of the action alternatives.
- State regulations help Federal mangers and scientists monitor fishing, provide additional fishery regulations, and provide locations for bottomfish research. Regulations by the State of Hawaii that include provisions that may affect uku catch include the presence of BRFAs around Hawaii. Since the State removed four of the BRFAs, there could be a temporary increase of fishing effort in these areas. If effort in the former BRFAs does increase, uku catch may increase slightly as a non-target species caught while fishing for Deep 7 bottomfish. The uku fishery would continue to be monitored and the in-season closure AM implemented if needed. Therefore, even though the State opened four of the BRFAs, fishing for uku would remain sustainable.

- On February 8, 2019, NMFS published a final rule and amendment to the Hawaii FEP that designates a number of species of non-Deep 7 bottomfish as ECS (84 FR 2767). Pursuant to this rule, NMFS and the Council would continue to monitor catch of ECS, but they would not be subject to ACLs. Not implementing ACLs for ECS would not change the potential effects of any of the alternatives considered in this EA because the ACLs for ECS that were previously included in the non-Deep 7 bottomfish did not include AM and catch was only evaluated after the fishing year ended, and because the non-Deep 7 ACLs were not exceeded in recent years. NMFS and the Council would also monitor ECS catch to determine if a targeted fishery for any of these species develops creating a need for Federal management.

Other reasonably foreseeable management actions that may relate to the proposed action:

- The Council is expected to continue to recommend ACLs for a number of Hawaii FEP MUS, including Deep 7 bottomfish, deepwater shrimp, precious corals, and Kona crab. These fisheries have been managed using ACLs and AMs since 2007 for Deep 7 bottomfish and 2012 for the remaining MUS. The MHI uku fishery does not overlap with these other fisheries to a large extent such that ACLs and AMs under consideration in the uku fishery would result in more fishing in these other fisheries or in the pelagic fisheries, except as discussed previously for Deep 7 bottomfish. Conversely, uku is not caught incidentally in any of these fisheries except in the MHI Deep 7 bottomfish fishery, so implementation of ACLs would not affect the uku fishery as discussed previously. In the case of the Deep 7 fishery, uku may be caught incidentally while fishing for Deep 7 such as opakapaka. Commercial catch of uku would be reported through the State CML reporting system, and would be applied toward the uku ACL. The Deep 7 bottomfish fishery is unlikely to close given recent catch history relative to the recent ACL (84 FR 8835; March 12, 2019). Implementation of this ACL is therefore unlikely to affect the MHI uku fishery. Because these fisheries have a history of management under catch limits, they do not have unknown or uncertain impacts, and do not interact substantially with the MHI uku fishery. For this reason, the impacts of the proposed MHI uku ACL and AM can be considered separately from the ACLs and AMs for other Hawaii fisheries.
- NMFS is expected to develop a new stock assessment for uku that will inform management measures for 2025 and beyond. At such time as the new stock assessment is determined to be BSIA, the Council may make new recommendations for ACLs, ACTs, and AMs for these years. Rules implemented on the basis of these recommendations may change the management measures implemented under the present proposed action for 2022 – 2025. These rules would be implemented according to the same public process as the current action and in accordance with all applicable laws and regulations, and subject to review under NEPA.

Relevant external factors

- A number of factors have the potential to affect participation in MHI commercial bottomfish fisheries, including those targeting uku. Current factors may include, but are not limited to: high fuel costs, high costs of other equipment and supplies, and costs of living that affect time available to fish; experienced fishermen leaving the fishery and the high level of skill needed to enter the fishery (Yau 2018). The effect of these factors is

that, although it is speculative, we do not anticipate a large expansion in uku fishing in the scope of time covered by this EA. Because of the qualitative nature of this information, we will not refer to these factors in the cumulative effects analysis.

4.7.1 Cumulative Effects Related to Effects on the Physical Resources

The MHI uku fishery is not known to have adverse effects on air quality, noise, water quality, view planes, or terrestrial resources, and continued management of the fishery using ACLs and AMs would not change relative impacts to the physical environment (see Section 4.2). Fishing behavior and effort are not expected to change substantially under any of the proposed Alternatives.

4.7.2 Cumulative Effects Related to Effects on the Biological Resources

4.7.2.1 Target species – Uku

The implementation of a multi-year ACL, ACT and AM for the uku fishery over the 2022-2025 management period is not expected to result in cumulative environmental effects to the health of the MHI uku stock. This is because the proposed action would set the ACL below the OFL of 302,033 lb estimated for uku in the 2020 stock assessment (Nadon et al. 2020) at a level that includes consideration of scientific and other uncertainties through the P* and SEEM processes. Annual catches in fishing years 2019–2021 are expected to remain below the proposed ACLs. Analysis in the 2022 stock assessment found that the uku fishery is healthy.

Under Alternative 1, the fishery would not operate with an ACL or AMs in the next four years. This alternative would not provide active management of the uku stock to prevent overfishing. There is the potential for an increase in catch and fishing effort because the fishery would not be constrained, though it is expected that uku catches will remain within the range landed in recent years.

Under the Alternatives 2, 4, 5, and 6, fishing could be constrained in-season by a fishery closure if the ACL or ACT is projected to be caught. Under Alternative 3, there is no in-season AM, but there is a post-season AM relative to the ACL. If the fishery caught more than the ACL under all but Alternative 1, and the three-year average catch exceeded the ACL, the ACL would be decreased in the following fishing year to offset the overage. The ACLs, ACTs and AMs together would result in continued sustainable management of the uku stock in Federal waters and prevent cumulative effects under Alternatives 2 through 6.

Continued management of the fishery under all alternatives is not expected to result in large and adverse effects to the uku stock in the MHI. The 2020 stock assessment assumes average total catch would be relatively constant and equal to the ACL under Alternatives 3 through 6. If the entire ACL implemented by this EA was not caught in a particular year, the actual risk of overfishing the following year would be less than the estimated risk of overfishing associated with the ACL. For example, if the fishery does not catch 295,419 lb in one or more fishing years as expected, the actual risk of overfishing would be less than 41% for an ACL of 295,410 lb in later fishing years in the 2022-2025 management period. This aspect of the estimates of the risk of overfishing provides an additional layer of precaution to ACLs in future years if catch is lower than the ACL as expected. Based on the recent performance of the fishery, total annual catches

are expected to remain below the proposed ACLs most years, so the realized risk of overfishing would likely be less than the 41% (alternatives 3-5) or 36% (Alternative 6), which is based on year after year catch at the ACL.

The 2020 stock assessment considered the potential effects on stock health of commercial and non-commercial catches in the MHI. Therefore, all catches of uku were considered, and there would not be an unknown or unsustainable cumulative effect. Also, the SSC used results of visual surveys as a basis for the ABC recommendation, which provide more conservative estimates for OFL and ABC than those produced by previous uku catch levels (Williams and Ma 2013). These factors result in a conservative ACL recommendation that prevents cumulative effects on fish stocks.

4.7.2.2 Non-Target Species and Bycatch

Potential cumulative effect of the MHI uku ACL on Deep 7 bottomfish fishing

Implementing ACLs, ACTs, and AMs for uku as proposed under the action alternatives is not expected to cause impacts that interact with potential environmental effects for the MHI Deep 7 bottomfish stock complex. If that fishery were to close, some vessels may switch to fishing for uku. However, based on recent fishing history and expected levels of fishing, the MHI commercial Deep 7 bottomfish fishery in Hawaii is unlikely to close in upcoming fishing years. Regardless of events in the Deep 7 bottomfish fishery, uku catches would continue to be monitored and reviewed under the ACLs, ACTs, and AMs analyzed in this EA. Conversely, if the uku fishery did close, some fishermen might switch to fishing for Deep 7 bottomfish. This fishery catches well below its ACL, so any effort displaced from uku to the Deep 7 fishery would not affect the sustainability of these stocks. Also, because both fisheries would continue to be monitored and managed for sustainability, the proposal to continue to implement ACLs, ACTs, and AMs for uku would not have effects that could result in cumulatively large and adverse effects on MHI bottomfish stocks or other resources. The proposal to implement ACLs, ACTs, and AMs for MHI uku would not affect the sustainability of MHI Deep 7 bottomfish under future fishing.

Potential cumulative effects of the MHI uku ACL on non-Deep 7 bottomfish fishing

From 2013 to 2016, the MHI non-Deep 7 bottomfish fishery catch, 80% to 90% of which was comprised of uku, has not surpassed its associated ACL; there was no ACL implemented for MHI non-Deep 7 bottomfish in 2017 or 2018. In 2017, commercial catch of uku was 131,947 lb (Table 3). This catch is the highest level of commercial catch for the non-Deep 7 bottomfish fishery in the MHI since 1994, but it is below the most recent MHI non-Deep 7 bottomfish ACL (178,000 lb) (NMFS 2015) and the previous estimates of MSY (265,000 lb) and OFL proxy (259,200 lb) for the MHI non-Deep 7 bottomfish (Sabater and Kleiber 2014). Since 2018, the MHI commercial uku fishery has caught only 41%, on average, of the 127,205 lb ACL from 2019 to 2021. Because recent uku ACLs have been higher than average catches and the non-Deep 7 bottomfish fishery was not constrained by ACLs or an in-season AM, average commercial catches of MHI non-Deep 7 bottomfish ECS are not expected to change under any alternative under consideration. Catch of non-Deep 7 bottomfish ECS in each of the next three years is expected to remain within the range of recent catch levels. Thus, none of the alternatives are expected to result in a large cumulative

effect to non-Deep 7 bottomfish ECS. Catch of non-Deep 7 bottomfish ECS will continue to be monitored through commercial catch reports so NMFS and the Council can adapt future management if fishery targets change.

Bycatch in the MHI bottomfish fishery is low and not believed to affect these species (Kawamoto and Gonzales 2005; NMFS 2018). Even if effort in the MHI uku bottomfish fishery were to increase (e.g., in the unlikely event of a Deep 7 fishery closure), effects on non-target species caught by the fishery are not expected to result in cumulatively large adverse effects to those species. This is because non-target catch rates are relatively low in comparison to catches of target species; the non-target species most often caught by the fishery are generally discarded alive and the most commonly caught non-Deep 7 ECS such as taape have large and healthy populations (Nadon 2017). NMFS and the Council will also continue to monitor catch of ECS to evaluate changes to catch that would prompt management measures. For these reasons, continued management of the fishery under ACLs and AMs is not expected to result in cumulatively large and adverse effects to non-target species.

Potential cumulative effects on other Hawaii FEP fisheries

In addition to the ACLs, ACTs, and AMs for uku being considered in this EA, NMFS will implement the Council's ACL and AM recommendations for all other Hawaii fisheries for 2022 and beyond, including crustacean fisheries (deepwater shrimp and Kona crab), and precious coral fisheries (black coral, pink coral, and bamboo coral). These fisheries have been managed using ACLs and AMs since 2012; they do not have unknown or uncertain impacts, and do not interact with the MHI bottomfish fisheries in any way.

The MHI uku fishery does not overlap with these other fisheries to a large extent such that ACLs, ACTs and AMs in the uku bottomfish fishery would result in more fishing in these other fisheries. For this reason, the impacts of the proposed MHI uku ACLs, ACTs and AMs will not result in cumulative effects and can be considered separately from the ACLs and AMs for Hawaii crustacean and precious coral fisheries.

Potential cumulative effects on protected species

Under all alternatives under consideration, fishing is expected to remain within levels considered during consultations and no additional effects to protected species are expected. The fishery would continue to be authorized and conducted in accordance with Section 7 of the ESA and the MMPA (as described in Sections 3.3.2 and 4.3.1.4). The analysis of effects of the uku fishery under each of the alternatives found that the fishing is not likely to have significant effects on the survival or recovery of any listed species, largely because the fishery has low levels of interactions with these listed species, because fishery participants release protected species caught on hooks, and because vessel collisions with sea turtles are far below levels that would jeopardize survival and recovery. NMFS analysis of effects on ESA- and MMPA-listed species took into consideration outside actions that affect the same species. In general, continued management of the fishery under the full suite of management measures, including the proposed ACLs, ACTs and AMs for the next several years, would not change the fishery in any way that is likely to have the potential for large and adverse cumulative effects on listed species.

4.7.3 Cumulative Effects Related to Effects on the Socio-economic Setting

Management of the MHI commercial uku fishery using ACLs, ACTs, and AMs is not known to have large adverse effects on the socio-economic setting. Implementation of an ACL greater than recent average catch allows for greater harvests, associated increases in effort and revenue, and a continued supply of bottomfish to fishing communities (see Section 4.4.1). Social and economic considerations were incorporated into the development of the ACLs through the Council deliberation process and public comment periods, and none of the proposed ACLs or ACTs are expected to have adverse cumulative effects to the socio-economic setting given the nature of the fishery for uku in the MHI.

Implementation of proposed ACLs and ACTs is not likely to be associated with a rapid expansion of the fishery that could have adverse social effects. A number of factors serve as barriers to increased participation in MHI bottomfish fishing. In particular, having success fishing for bottomfish requires a high degree of skill (Yau 2018). This factor, combined with high costs of boats, equipment and other supplies, prevent the commercial fishery from becoming overcapitalized. The MHI uku non-commercial fishery provides bottomfish for sustenance, gifts to friends and family, and, in the case of the commercial fishery, local markets; this provides positive social, cultural and economic benefits to fishermen, buyers and fishing communities in Hawaii (Hospital and Beavers 2012). Management of the fishery under scientifically based catch limits supports a sustainable fishery that maintains these social and economic benefits.

4.7.4 Cumulative Effects Related to Effects on the Management Setting

The proposed action is a continuation of ongoing, long-term management of the MHI uku fishery in the wake of the ECS amendment (84 FR 2767) that caused uku to be the only remaining MUS from the MHI non-Deep 7 bottomfish species complex. This fishery has been managed by NMFS and the Council through the specification of ACLs and AMs since 2012, in coordination with the State of Hawaii. Implementation of the proposed ACLs, ACTs, and AMs for the 2022, 2023, 2024, and 2025 fishing years will not change the ongoing management environment, and will not add a cumulative effect to the management setting in a substantial way (Section 4.5). None of the proposed ACLs or ACTs are expected to result in substantial cumulative adverse effects on the cost of administering the fishery (including monitoring catches, implementing the annual limits, closing the fishery, or enforcing regulations). Because of the lack of large changes in management, none of the proposed alternatives possesses the potential to have substantial cumulative effects on fishery participants in terms of compliance with the fishery requirements.

4.7.5 Other Considerations

4.7.5.1 Climate Change and Greenhouse Gases

Changes in the environment from global climate can affect physical and biological conditions of the ocean that in turn can affect marine species. Among the changes anticipated and being studied include water temperatures and acidification, vertical stratification, changes in circulation patterns, thermal expansion, sea level changes, and changes to storm frequency and severity. These changes can affect production, species migrations and distribution, behavior, nutrients, and food web shifts; and could result in positive or negative effects to specific species (Doney 2006;

Kleypas et al. 2006; Pörtner et al. 2014; Polovina et al. 2011). Changes to these properties may affect marine species differently through complex physical, physiological, and ecological interactions (Pörtner et al. 2014; Sydeman et al. 2015). Impacts from climate change and ocean acidification specific to fishes such as uku have not been identified, and may be difficult to discern from other impacts. However, regardless of which alternative is selected, monitoring of physical conditions and biological resources by a number of agencies would continue to occur and would allow fishery managers to make adjustments in fishery management regimes in response to changes in the environment or stock status. Attention to trends in fishery performance and appropriate management measures will be key to offsetting negative effects of climate change (Gaines et al. 2018). Appropriate fishing mortality controls, such as those proposed here, are a way to mitigate climate impacts.

The efficacy of the proposed ACLs, ACTs, and AMs in providing for sustainable levels of fishing for bottomfish such as uku is not expected to be adversely affected by climate change. Recent catches relative to OFL estimates and a 2020 stock assessment helped to inform the development of the ACLs, ACTs, and AMs. NMFS will developing a new stock assessment that will provide updated information on the uku fishery in 2024 or 2025. Monitoring would continue, and, if monitoring shows overfishing is occurring, ACLs and other fishery management provisions could be adjusted in the future.

Because the proposed management actions represent a continuation of fairly intensive fishery management, including both monitoring for harvest limits as well as interactions with protected species; and because the fishery is managed under a suite of fishery management measures that provide continued research, monitoring, and evaluation, the potential effects of climate change are not expected to combine with the proposed ACLs, ACTs and AMs to result in a cumulatively large and adverse effect on any marine resource.

Consideration of greenhouse gas emissions

The current uku fishery relies on vessels which are powered by fossil fuels and which emit greenhouse gases from fossil fuel combustion. The proposed ACLs, ACTs, and AMs in alternatives under consideration would not result in a change in fishing in any way that would have large effects on vessel use or fuel consumption or greenhouse gas emissions. Even if the fishery were to be subject to a fishery closure, such closures are likely to occur near the end of the fishing year and vessel owners are likely to already be using their vessels for other fishing, recreational, or economic purposes. For these reasons, neither action alternative is expected to result in changes to the manner in which vessels are used, so there would be no change in greenhouse gas emissions.

For these reasons, climate change, considered in addition to all other factors affecting MHI uku stocks (including fishing), is not expected to result in a large and adverse cumulative impact on the fishery in the short- or long-term. The proposed ACLs are intended to provide for long-term sustainability of the uku fishery, and monitoring of the fishery over time will provide data to evaluate effects of climate change in conjunction with other scientific studies so that NMFS and the Council can adapt management measures as needed. Conversely, continued operation of the uku fishery under the alternatives under consideration is not expected to change greenhouse gas emissions and subsequent effects on the climate.

4.8 Other Actions Including Connected Actions

The proposed action is intended to manage the fishery sustainably and includes accountability measures. The fishery will continue to be monitored to track and evaluate catch relative to the ACL, ACT, and AMs are implemented to prevent and mitigate effects on fish stocks if necessary. No additional mitigation is required to limit the degree of effect of the proposed action or alternatives to be less than minor or insignificant.

4.9 Summary of Effects

The environmental effects of the six alternatives considered in this EA are summarized in Table 19.

Table 19. Environmental Effects of the Alternatives.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
Overview of the Alternatives	No ACL or AM.	ACL and AMs for commercial catch only. Both in-season and post-season AMs. The status quo management.	ACL and AM for commercial and non-commercial catch. Post-season AM only.	ACL and AM for commercial and non-commercial catch. Both in-season and post-season AMs.	ACL and AM for commercial and non-commercial catch. Both in-season and post-season AMs, ACT to address uncertainty in non-commercial catch estimates.	ACL and AM for commercial and non-commercial catch. Both in-season and post-season AMs, ACT to address uncertainty in non-commercial catch estimates.
4.1 Effects on the uku fishery: expected fishery outcome of alternatives	No change to fishery, small chance of exceeding Council recommended ACL.	No change to fishery, small chance of commercial catch exceeding the ACL based on 2016 assessment requiring closure in-season.	No change to fishery.	No change to fishery, small chance of commercial catch exceeding the ACL based on 2020 assessment requiring closure in-season.	Same as Alt. 4.	Same as Alt. 4.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.1 Effects on the uku fishery: location, gear, participation, effort, seasonality	Approximately two thirds of the total harvest of uku is made in Federal waters across the MHI. Uku is seasonal, with a peak in fishing activity in early summer. Alt. 1 would not result in a change to the fishery with respect to location, gear, seasonality, participation, or intensity. (Section 2.2.1, section 3.1, section 4.1.1)	Same as Alt. 1, though some uku fishing may shift into State waters near the end of the fishing year in the event that the fishery is closed in Federal waters. (Section 2.2.2, section 3.1, section 4.1.2)	Same as Alt. 1. (Section 2.2.2, section 3.1, section 4.1.2)	Same as Alt. 1, though some uku fishing may shift into State waters near the end of the fishing year in the event that the fishery is closed in Federal waters. (Section 2.2.2, section 3.1, section 4.1.2)	Same as Alt. 1, though some uku fishing may shift into State waters near the end of the fishing year in the event that the fishery is closed in Federal waters. (Section 2.2.2, section 3.1, section 4.1.2)	Same as Alt. 1, though some uku fishing may shift into State waters near the end of the fishing year in the event that the fishery is closed in Federal waters. (Section 2.2.2, section 3.1, section 4.1.2)

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.2 Physical Resources: air and water quality, noise, and viewplanes	No effect, not considered further.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.2 Physical Resources: unique features of the geographic environment	The Hawaii bottomfish fisheries including the uku fishery do not affect unique features of the geographic environment.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.3 Biological Resources: target species	Not managed under a catch limit as required by the Magnuson-Stevens Act. There would not be management controls in place to ensure sustainability. Combined commercial and non-commercial catch have not exceeded the OFL under the 2020 assessment in more than 8 years, but if exceeded, the fishery could be unsustainable.	Not managed using BSIA as required by the Magnuson-Stevens Act. Commercial catches would be constrained at the ACL specified in 2019-2021 management and depending on non-commercial catches, is expected to remain sustainable.	Commercial and non-commercial catches would be constrained at the ACL post-season and are expected to remain sustainable.	Commercial and non-commercial catches would be constrained at the ACL both in-season and post-season and are expected to remain sustainable.	Commercial and non-commercial catches would be constrained at the ACT in-season and ACL post-season and are expected to remain sustainable.	Commercial and non-commercial catches would be constrained at the ACT in-season and ACL post-season and are expected to remain sustainable.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.3 Biological resources: Deep 7 bottomfish stock	Uku are caught using similar gear to the MHI Deep 7 bottomfish fishery, but in shallower water. Catches of uku do not cause changes to the Deep 7 bottomfish fishery, which is managed under a separate ACL and AMs. The MHI Deep 7 bottomfish fishery is unlikely approach it's ACL.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.3 Biological resources: other non-target and bycatch	Effects on non-target stocks are expected to continue at low levels. Most bycatch species are shallow water species and/or those that do not experience severe effects of barotrauma, are known to be ciguatoxic and have little or no market value, or are sharks, which are released alive.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.3 Biological resources: protected species	The MHI bottomfish fisheries overlap the range of a number of protected species, which are described in section 3.3.2. The MHI uku fishery would continue to operate within existing ESA and MMPA authorizations. The uku fishery would continue to have a low level of authorized interactions with protected species that are incidental to fishing. A low level of incidental vessel collisions with turtles could	Same as Alt. 1. If there was an in-season closure, fishermen may engage in other types of fishing, but this would not cause new adverse effects on listed species that have not already been considered for that fishery.	Same as Alt. 1.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.3 Biological resources: critical habitat	No change to effects on critical habitat of monk seal or the MHI insular false killer whale DPS.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.3 Biological resources: habitats and vulnerable ecosystems	The MHI uku fishery overlaps with water column and substrate EFH for bottomfish management unit species (BMUS), precious coral MUS, Kona crab, and pelagic MUS. The MHI uku fishery does not affect habitat. No change is expected to the fishery, so no effects to EFH, HAPCs or MPAs.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.3 Biological resources: other vulnerable marine or coastal ecosystems	The MHI uku fishery is not known to be adversely affecting other vulnerable coastal ecosystems including deep coral ecosystems. Bottomfish fishing does not affect habitat.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.4 Socio-economic setting: fishing communities	The affected fishing community is the populated islands of the Hawaiian Archipelago and includes fishermen, vendors, and consumers. Fishing is not expected to change from recent years, so fishing communities would not be affected.	Fishery not likely to close, or would close near the end of the year when other species or fishing areas could be targeted, so no large change expected from Alt. 1.	Same as Alt. 1.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.
4.4 Socio-economic setting: public health or safety	fishery is not causing an adverse effect on public health or safety	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.4 Socio-economic setting: controversial?	Public participation in the management process to date indicates the action is non-controversial.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: fishery participants	Unlikely to have effects on the human environment.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: subsistence harvest or gathering	The uku fishery does not affect any subsistence harvest or gathering.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: safety at sea	There are no known safety-at-sea issues in the MHI uku fishery.	The proposed ACL is high enough that a race to fish is not expected so this alternative would not be associated with reducing safety-at-sea in the fishery.	Same as Alt. 2.	Same as Alt. 2.	The proposed ACT is high enough that a race to fish is not expected so this alternative would not be associated with reducing safety-at-sea in the fishery.	Same as Alt. 5.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.4 Socio-economic setting: revenue	Fishing is expected to continue at levels similar to recent years, and fishermen would realize $446,000 if they catch 92,902 lb and sell 92% of their catch.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: historic sites	No listed sites, and no effects to sites that may be eligible for listing.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.4 Socio-economic setting: scientific, cultural and archaeological resources (e.g., shipwrecks, cultural fishing areas or koa)	Any known unique scientific resources protected from all fishing as State MPAs. There are no known traditional fishing sites in Federal waters. There are no known effects to shipwrecks, as bottomfish fishermen avoid them.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.5 Management setting: NMFS management	NMFS would not need to implement an ACL and AMs annually. NMFS would continue to participate in annual fishery monitoring activities with the Council.	NMFS would continue to participate in Council monitoring activities on an annual basis. Additional administrative costs would be required for NMFS to monitor commercial uku catch on a monthly basis, and to implement an in-season fishery closure or any ACL overage adjustment if needed.	NMFS would continue to participate in Council monitoring activities on an annual basis and implement any ACL overage adjustment if needed.	NMFS would continue to participate in Council monitoring activities on an annual basis. Additional administrative costs would be required for NMFS to monitor commercial uku catch on a monthly basis and non-commercial catch after each two month wave estimate, and to implement an in-season fishery closure or any ACL overage adjustment if needed.	Same as Alt. 4.	Same as Alt. 4.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.5 Management setting: precedent for future actions or represent a decision in principle about a future consideration	No. Magnuson-Stevens Act and the Hawaii FEP require that NMFS implement ACLs and AMs for all management unit species. This alternative would not results in significant effects or narrow future options for management.	No. Magnuson-Stevens Act and the Hawaii FEP require that NMFS use BSIA in all management decisions. This alternative would not results in significant effects or narrow future options for management	This alternative would not results in significant effects or narrow future options for management	Same as Alt. 3.	Same as Alt. 3.	Same as Alt. 3.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.5 Management setting: council management activities	The Council would continue to monitor and review uku fish catches at the end of a fishing year in the annual report.	The Council would review uku commercial catches in-season relative to ACL with potential for in-season fishery closure and at the end of a fishing year and consider 3-year average recent catches and determine whether an ACL overage adjustment is required.	The Council would review uku commercial and non-commercial catches at the end of a fishing year and consider 3-year average recent catches and determine whether an ACL overage adjustment is required.	The Council would review uku commercial and non-commercial catches relative to ACL with potential for in-season relative to potential in-season fishery closure and at the end of a fishing year and consider 3-year average recent catches and determine whether an ACL overage adjustment is required.	The Council would review uku commercial and non-commercial catches relative to ACT with potential for in-season relative to potential in-season fishery closure and at the end of a fishing year and consider 3-year average recent catches and determine whether an ACL overage adjustment is required.	Same as Alt. 5.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.5 Management setting: State management activities:	State would administer the CML and catch reporting programs and would enforce fishery related laws in State waters and on shore.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.5 Management setting: complementary Federal and State management	The State does not currently have a catch limit or closure for uku in State waters around Hawaii, but is considering implementing these in the future.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.5 Management setting: fishermen's compliance	Fishermen would comply with State laws regarding commercial marine license to catch fish for sale, reporting requirements, size limits, closed fishing areas.	As Alt. 1, and fishermen would need to learn about the potential for an in-season closure, and comply with the no-retention regulation for uku caught in Federal waters if a closure was implemented.	Same as Alt. 1.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.
4.5 Management setting: enforcement	Enforcement needs would not change.	If the fishery did close in Federal waters during the season, additional resources would be needed to enforce the closure.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.6 Other: biodiversity and ecosystem function	Uku fishery at expected levels will not affect the population of uku, and does not have known effects on biodiversity or ecosystem function.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.6 Other: unique or unknown risks	Unlikely, but this alternative involves the most uncertainty since the fishery would be unconstrained.	Unlikely given the conservative approach to define the ACL and AMs.	Same as Alt. 2.	Same as Alt. 2.	Unlikely given the conservative approach to define the ACL, ACT, and AMs.	Same as Alt. 5.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.6 Other: environmental justice	The uku fishery does not affect patterns of subsistence use or members of low-income or minority groups disproportionately. The uku fishery operating under this alternative would not have the potential for adverse environmental or health effects on low-income or minority populations.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3.**	**Alt. 4.**	**Alt. 5. (Preferred)**	**Alt. 6.**
4.7 Cumulative effects	Over time, continued fishing without ACL or AMs could result in unsustainable fishing because this alternative lacks regulatory authority to ensure fishing does not exceed sustainable levels.	No cumulative effects. Alternative 2 continues management under Magnuson-Stevens Act and Hawaii FEP that has been in place since 2012, and is designed to prevent cumulative effects to target or non-target stocks, maintain continuity for management, and provide continuous benefits for fishing communities.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.	Same as Alt. 2.

5 APPLICABLE LAWS

Section 303 of the Magnuson-Stevens Act requires that any fishery management plan prepared by any fishery management council or by the Secretary of Commerce contain conservation and management measures that are consistent with the National Standards of the Act, other provisions of the Act, regulations implementing recommendations by international fishery management organizations and any other applicable law. This section identifies provisions of the other applicable laws that the NMFS and the Council has identified the proposed action must comply with, and rationale for why this action is consistent with each applicable law.

5.1 National Environmental Policy Act

In accordance with NEPA, NOAA Administrative Order (NAO) 216-6A – *Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands* requires NMFS to consider the effects of proposed agency actions and alternatives on the human environment. As part of this process, NMFS and the Council provide opportunities for the involvement of interested and affected members of the public before a decision is made. NMFS and the Council prepared this EA in accordance with NEPA and its implementing regulations, at 40 CFR 1500–1508, and in coordination with various Federal and local government agencies that are represented on the Council.

On MONTH DAY, 2021, NMFS published a proposed rule with ACLs, ATCs, and AMs for uku, accompanied by a draft EA dated MONTH DAY, 2021 (## FR ####). NMFS requested public review and comments on the proposed rule and draft EA. The comment period ended MONTH DAY, 2021. NMFS received several comments that [generally supported the rule]. NMFS considered public comments in finalizing the EA; none of the comments resulted in a change to the rule or the analysis in the EA.

The NMFS Regional Administrator will use this EA to consider the effects of the proposed action on the human environment, taking into consideration public comments on the proposed action presented in this document, and to determine whether the proposed action would have a significant environmental impact requiring the preparation of an environmental impact statement.

5.2 Coastal Zone Management Act

The Coastal Zone Management Act requires a determination that a recommended management measure has no effect on the land, water uses, or natural resources of the coastal zone or is consistent to the maximum extent practicable with an affected state's enforceable coastal zone management program. NMFS determined that this proposed action is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of the State of Hawaii. NMFS submitted this determination for review by the appropriate state agency under section 307 of the CZMA on MONTH DAY, 2021. On MONTH DAY, 2021, the State of Hawaii responded that it considers the proposed action to be an implementing measure of the Hawaii FEP, which the Hawaii CZM Program previously reviewed and issued a consistency determination. Therefore, the proposed action is not subject to the Federal consistency review by the Hawaii CZM Program.

5.3 Endangered Species Act

The ESA provides for the protection and conservation of threatened and endangered species. Section 7(a)(2) of the ESA requires Federal agencies to ensure that any action authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. Pursuant to Section 7 of the ESA, NMFS has evaluated or is evaluating the MHI uku fishery for potential effects to ESA-listed species under the jurisdiction of NMFS that occur in action area. The conclusions of these consultations are briefly summarized in Table 20.

Table 20. ESA Section 7 consultations for Hawaii bottomfish fisheries

Year	Key considerations	Conclusion
2008	blue, fin, humpback, Northern right, sei or sperm whales; olive ridley, hawksbill, and leatherback sea turtles and Hawaiian monk seal	Not likely to be adversely affected
2008	Green sea turtle	Likely to be adversely affected, not likely to jeopardize
2013	MHI false killer whale DPS	Not likely to be adversely affected
2016	Hawaiian monk seal critical habitat	Not likely to be adversely affected
	MHI false killer whale critical habitat	Consultation pending
	Oceanic whitetip shark	Consultation pending
	Giant manta ray	Consultation pending

Because the proposed action is not expected to significantly modify vessel operations or other aspects of the fishery, NMFS and the Council do not expect the bottomfish fisheries in Hawaii to have an effect on any previously listed species or designated critical habitats that were not considered in prior consultations.

NMFS recently listed the oceanic whitetip shark and giant manta ray as threatened species under the ESA. NMFS also recently designated critical habitat for the MHI insular false killer whale distinct population segment. The two species and critical habitat occur within the area of operation of the MHI bottomfish fishery. Based on the information in the supporting biological evaluation (NMFS 2019c), we concluded that the proposed action (1) may affect and is likely to adversely affect the oceanic whitetip shark, (2) may affect, but is not likely to adversely affect, the giant manta ray, and (3) is not likely to adversely modify designated critical habitat for the MHI insular false killer whale. On February 1, 2019 NMFS SFD requested reinitiation of formal

consultation under section 7(a)(2) of the ESA for the MHI bottomfish fishery in response to the listing of the oceanic whitetip shark and giant manta ray as threatened, and the designation of critical habitat for the MHI IFKW DPS, and on June 5, 2019, NMFS Protected Resources Division reinitiated consultation. Also, on February 1, 2019, and again on July 9, 2021, NMFS SFD determined that the conduct of the Hawaii bottomfish fisheries during the period of consultation will not violate ESA Section 7(a)(2) and 7(d) with respect to these listings.

As of the drafting of this EA, PIRO Protected Resources Division is continuing to evaluate information relevant to the consultation. The proposed action under consideration would not change the manner in which the fishery operates with respect areas fished, gear used, or methods employed, so interactions with the protected are not anticipated to change in frequency or intensity from those analyzed in the 2020 EA. The MKI uku fishery will continue to not likely to adversely affect with oceanic whitetip sharks and giant manta rays, or critical habitat of the MHI IFKW DPS.

5.4 Marine Mammal Protection Act

The MMPA prohibits, with certain exceptions, the take of marine mammals in the U.S. and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States. The MMPA gives NMFS as delegated by the Secretary of Commerce, the authority and duties for all cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions, except walruses). With this responsibility, NMFS required to prepare and periodically review stock assessments of marine mammal stocks.

Under Section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries (LOF) that classifies U.S. commercial fisheries into one of three categories. These categories are based on the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. Specifically, the MMPA mandates that each fishery be classified according to whether it has frequent, occasional, or a remote likelihood of or no known incidental mortality or serious injury of marine mammals. A Category I fishery is one with frequent incidental morality and serious injury of marine mammals. A Category II fishery is one with occasional incidental morality and serious injury of marine mammals. A Category III fishery is one with a remote likelihood or no known incidental morality and serious injury of marine mammals.

According to the 2021 LOF (86 FR 3028; January 14, 2021), the Hawaii bottomfish handline fishery is classified a as a Category III fishery under Section 118 of the MMPA. Because non-commercial fisheries are not included in the LOF and use a variety of gear types (Section 3.1), we note that other Hawaii-based commercial fisheries using gears consistent with the non-commercial fishery are also classed as Category III: Hawaii inshore handline, Hawaii pelagic handline, Hawaii troll, and Hawaii rod and reel. Participants in Category III fisheries are not required to register in the Marine Mammal Authorization Program prior to engaging in commercial fishing. Because NMFS and the Council do not expect the proposed action to modify vessel operations or other aspects of any fishery, it would not introduce impacts not previously considered in prior MMPA determinations or the List of Fisheries classification.

5.5 National Historic Preservation Act

The National Historic Preservation Act requires Federal agencies undergo a review process for all federally funded and permitted projects that will affect sites listed on, or eligible for listing on, the National Register of Historic Places. There are presently no known districts, sites, highways, cultural resources structures or objects listed in or eligible for listing in the National Register of Historic Places in the EEZ around the MHI. Uku fishing is not known to have a damaging impact on the marine environment, including any man-made resources or structures. None of the alternatives would likely change the conduct of the uku fishery.

5.6 Executive Order 12866 (Regulatory Impact Review)

A "significant regulatory action" means any regulatory action that is likely to result in a rule that may –

1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal government or communities;
2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

NMFS has determined that this action is not significant for the purpose of E.O. 12866.

5.7 Executive Order 13132 (Federalism)

The objective of E.O. 13132 is to guarantee the Constitution's division of governmental responsibilities between the Federal government and the states. Federalism implications are defined as having substantial direct effects on states or local governments (individually or collectively), on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. NMFS and the Council do not expect that this action would impact or alter the relationship between the Federal government and the government of the State of Hawaii.

5.8 Information Quality Act

The Information Quality Act (IQA) and NOAA standards (NOAA Information Quality Guidelines, September 30, 2002) recognize information quality is composed of three elements: utility, integrity, and objectivity. National Standard 2 of the Magnuson-Stevens Act states that an FMP's (FEP's) conservation and management measures shall be based upon the best scientific information available. This EA incorporates the best biological, social, and economic information available to date, including the most recent biological information on, and assessment of, the fishery resources and protected resources, and the most recent information available on fishing communities, including their dependence on the MHI uku fishery, and up-to-date economic

information (landings, revenues, etc.). The management alternatives contained in this EA are supported by the best available scientific information, and are designed to meet the conservation goals and objectives of the Hawaii FEP, the Magnuson-Stevens Act, and other applicable laws.

The data and analyses used to develop and analyze the measures contained in the information product are presented in this EA. All reference materials are properly referenced within the appropriate sections of the EA. The information product was prepared by Council and NMFS staff based on information provided by NMFS PIFSC, NMFS PIRO, and the State of Hawaii Division of Aquatic Resources. The information product was reviewed by PIRO and PIFSC staff, and NMFS Headquarters (including the Office of Sustainable Fisheries). Legal review was performed by NOAA General Counsel Pacific Islands and General Counsel for Enforcement and Litigation for consistency with applicable laws, including but not limited to the Magnuson-Stevens Act, National Environmental Policy Act, Administrative Procedure Act, Paperwork Reduction Act, Coastal Zone Management Act, Endangered Species Act, Marine Mammal Protection Act, and Executive Orders 13132 and 12866.

5.9 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act is to minimize the paperwork burden on the public resulting from the collection of information by or for the Federal government. It is intended to ensure that the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501(1)). The proposed action would not establish any new permitting or reporting requirements.

5.10 Administrative Procedure Act

All Federal rulemaking is governed under the provisions of the Administrative Procedure Act (APA) (5 U.S.C. Subchapter II) which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider and respond to public comment on those rules before they are finalized. In developing the proposed ACL and AM recommendations, the Council held public meetings, provided opportunities for the public to comment on the proposed methods and recommendations, and the Council considered comments from the public and advisory bodies in making its recommendation.

On MONTH DAY, 2021, NMFS published a proposed rule with ACLs and AMs for uku, accompanied by a draft EA dated MONTH DAY, 2021 (## FR ####). NMFS requested public review and comments on the proposed rule and draft EA. The comment period ended MONTH DAY. NMFS received several comments that [generally supported the rule]. NMFS considered public comments in finalizing the EA and in making its decision on the proposed action, and responds to the comments in the final rule. [None of the comments resulted in a change to the rule or the analysis in the EA.]

5.11 Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires government agencies to assess and present the impact of their regulatory actions on small entities, including small businesses, small organizations, and small governmental jurisdictions. The assessment is done by preparing an

Initial Regulatory Flexibility Analysis (IRFA) and Final Regulatory Flexibility Analysis (FRFA) for each proposed and final rule, respectively. Under the Regulatory Flexibility Act, an agency does not need to conduct an IRFA or FRFA if a certification can be made that the proposed rule, if adopted, will not have a significant adverse economic impact on a substantial number of small entities. Based on the available information presented in this EA, NMFS has determined that all entities in the MHI uku fishery are small entities under the SBA's definition of a small entity, i.e., they are engaged in the business of finfish harvesting (NAICS Code: 114111), are independently owned or operated, are not dominant in their field of operation, and have annual gross receipts not in excess of $11 million. Even though this proposed action would apply to a substantial number of vessels, the implementation of this action would not result in significant adverse economic impact to individual vessels. Furthermore, there would be little, if any, disproportionate adverse economic impacts from the proposed rule based on gear type, or relative vessel size. The proposed rule also will not place a substantial number of small entities, or any segment of small entities, at a significant competitive disadvantage to large entities. NMFS does not expect the proposed action to have a significant economic impact on a substantial number of small entities.

5.12 Executive Order 12898 (Environmental Justice)

E.O. 12898 requires Federal agencies to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. E.O. 12898 also provides for agencies to collect, maintain, and analyze information on patterns of subsistence consumption of fish, vegetation, or wildlife. That agency action may also affect subsistence patterns of consumption and indicate the potential for disproportionately high and adverse human health or environmental effects on low-income populations, and minority populations. Agencies should also consider environmental justice when conducting NEPA analyses.

The fishery for uku in Hawaii is not known to have a large adverse environmental effect on stocks of fish that may be caught by subsistence fisherman or on other marine resources that may be targeted for subsistence consumption. The fishery does not pollute marine waters and so does not have adverse effects to human health or on marine life. NMFS and the Council manage fisheries through Federal regulations that are intended to conserve marine resources and habitats to enhance the economic and social well-being of fishing communities, including members of minority populations and low-income populations. For all these reasons, none of the alternatives under consideration would have the potential to have a disproportionately high and adverse human health or environmental effect on environmental justice populations; nor would the action alternatives have an adverse effect on subsistence patterns of consumption.

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7 DRAFT PROPOSED REGULATIONS

PART 665 – FISHERIES IN THE WESTERN PACIFIC

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

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

2. In § 665.211 revise Table 1 to paragraph (a) and paragraph (b) to read as follows:

§ 665.211 Annual Catch Limits (ACL).

(a) * * *

Table 1 to paragraph (a)

Fishery	**2021-22 ACL (lb)**	**2022-23 ACL (lb)**	**2023-24ACL (lb)**
Deep 7 bottomfish	492,000	492,000	492,000

Fishery	**2022 ACL (lb)**	**2023 ACL (lb)**	**2024 ACL (lb)**	**2025 ACL (lb)**
Uku	295,419	295,419	295,419	295,419

Fishery	**2022 ACT (lb)**	**2023 ACT (lb)**	**2024 ACT (lb)**	**2025 ACT (lb)**
Uku	291,010	291,010	291,010	291,010

* * * * *

(b) When a bottomfish ACL or ACT is projected to be reached based on analyses of available information, the Regional Administrator shall publish a document to that effect in the FEDERAL REGISTER and shall use other means to notify permit holders. The document will include an advisement that the fishery will be closed beginning at a specified date, which is not earlier than seven days after the date of filing the closure notice for public inspection at the Office of the Federal Register, until the end of the fishing year in which the ACL or ACT is reached.

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