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Final Environmental Assessment

Specification of Annual Catch Limits and Accountability Measures for Main Hawaiian Islands Deep 7 Bottomfish Fisheries in Fishing Years 2015-16, 2016-17, and 2017-18

(RIN 0648-XE062)

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Abstract

NMFS proposes to specify annual catch limits (ACL) and accountability measures (AM) for Hawaii Deep 7 bottomfish in fishing years 2015-16, 2016-17, and 2017-18, as recommended by the Western Pacific Fishery Management Council. This environmental assessment (EA) analyzes the potential environmental effects of the proposed action. NMFS would implement the specifications for each fishing year separately. The specifications would apply to bottomfish fishing in federal waters (the Exclusive Economic Zone or EEZ; generally 3-200 nm from shore) around the main Hawaiian Islands (MHI). As an AM, NMFS would close the fishery if data indicate that the fishery will reach the ACL. NMFS would also correct the next year's ACL if an overage occurs. The MHI Deep 7 bottomfish are onaga, ehu, gindai, kalekale, opakapaka, lehi, and hapuupuu.

The Council's Science and Statistical Committee (SSC) recommended a reduction in the

Acceptable Biological Catch (ABC) based on the most recent NMFS-approved stock assessment model (2011), updated with catch and effort data through 2013. The ACL has been 346,000 lb for every fishing year since 2011. For the 2015-2016 fishing year, the Council recommended that NMFS reduce the ACL by 20,000 lb to 326,000 lb. The Council recommended a phase-in approach for lowering the ACL over a three-year period. For the 2016-2017 fishing year, the Council recommended that NMFS reduce the ACL by 8,000 lb to 318,000 lb. For the 2017-2018 fishing year, the Council recommended that NMFS reduce the ACL by 12,000 lb to 306,000 lb.

The fishing year for Deep 7 bottomfish runs from September 1 through August 31 of the subsequent year (referred to as fishing years 2015-2016, 2016-2017, etc.). If the fishery reaches the ACL before August 31, NMFS would close the fishery and it would remain closed until September 1. Each fishing year, Deep 7 bottomfish catches from state waters (generally from the shoreline to 3 nm from shore) and federal waters around the MHI would be counted towards the specified ACL.

The State of Hawaii collects commercial bottomfish catch data from fishing vessels operating in both state and federal waters. As an AM to prevent the fishery from exceeding the ACL, NMFS would close the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters on the date that NMFS projects the fishery will reach the ACL. The fishery would remain closed through the end of the fishing year. Although not part of the proposed action, during a federal fishery closure, Hawaii has the authority to implement a complementary fishery closure in state waters. In addition, if NMFS determines that the Deep 7 bottomfish catch exceeded the ACL in a fishing year, then NMFS would reduce the Deep 7 bottomfish ACL for the following fishing year by the amount of the overage.

The proposed action complies with the Magnuson-Stevens Act, and is consistent with the provisions of the Fishery Ecosystem Plan for the Hawaiian Archipelago (FEP), which require NMFS to specify ACLs and AMs for all federally managed species. The Council recommended the ACLs and AMs in accordance with the ACL process approved by NMFS.

NMFS and the Council prepared this draft EA to evaluate the potential environmental impacts of the proposed ACL and AM specifications. The EA includes a description of the information and methods used by the Council to develop the proposed ACLs and AMs, and alternatives to the proposed specifications. The EA describes the affected environment and the potential effects of the fishery on target and non-target stocks, protected species, and other features of the environment. The preliminary analysis in the draft EA indicates that the proposed action is unlikely to change the MHI Deep 7 bottomfish fishery. While the ACL has been 346,000 lb since 2011, the fishery has not caught more than 309,485 lb in any recent fishing year. The proposed actions prevent overfishing and provide for continued sustainable harvest.

On February 23, 2016, NMFS solicited public comment on the proposed specifications and draft EA for this action. The comment period ended March 9, 2016. NMFS received no public comments. Find the draft and final versions of this EA by searching on RIN 0648-XE062 at www.regulations.gov, or by contacting the responsible NMFS official or the Council at the above address.

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Acronyms and 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
Hawaii DLNR – Hawaii Department of Land and Natural Resource
EA – Environmental Assessment
EEZ – Exclusive Economic Zone
FEP – Fishery Ecosystem Plan FM
FMP – Fishery Management Plan
FR – Federal Register
HDAR – Hawaii Division of Aquatic Resources
MHI – Main Hawaiian Islands
MFMT – Maximum Fishing Mortality Threshold
MSST – Minimum Stock Size Threshold
MSY – Maximum Sustainable Yield
NEPA – National Environmental Policy Act
NMFS – National Marine Fisheries Service
NOAA – National Oceanic and Atmospheric Administration
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 (SEEM)
SSC – Scientific and Statistical Committee of the Council
TAC – Total Allowable Catch
WPFMC – Western Pacific Fishery Management Council

1 Background

As authorized by the Magnuson-Stevens Act, NMFS and the Council manage fisheries for bottomfish in federal waters (EEZ) around the Hawaiian Islands. They manage the fishery under the FEP for the Hawaii Archipelago (Hawaii FEP) and implementing regulations at Title 50 Code of Federal Regulations, Part 665 (50 CFR 665). At present, the only active commercial fishery for bottomfish is in the MHI[1].

In the MHI, NMFS and the Council manage bottomfish management unit species (BMUS) as two separate stock complexes[2]: the MHI Deep 7 stock complex and the MHI non-Deep 7 stock complex. Table 1 lists the fish species in both complexes. The Deep 7 bottomfish are generally found along high-relief, deep slopes, ranging from 80-520 m deep. Fishermen typically catch the non-Deep 7 bottomfish during Deep 7 bottomfish trips, although at shallower depths (Table 1).

Table 1. Hawaii Bottomfish Management Unit Species (BMUS)

Common Name	Scientific Name	Local Name
*Silver jaw snapper	*Aphareus rutilans*	lehi
*Hawaiian grouper	*Hyporthodus quernus*	hapuupuu
*Short-tail red snapper	*Etelis carbunculus*	ehu
*Long-tail red snapper	*E. coruscans*	onaga
*Pink snapper	*Pristipomoides filamentosus*	opakapaka
*Lavender snapper	*P. sieboldii*	kalekale
*Banded snapper	*P. zonatus*	gindai
Grey jobfish	*Aprion virescens*	uku
Giant trevally	*Caranx ignobilis*	white ulua
Black jack	*C. lugubris*	black ulua
Blue-lined snapper	*Lutjanus kasmira*	taape
Yellowtail snapper	*P. auricilla*	yellowtail, kalekale
Thick lipped trevally	*Pseudocaranx dentex*	pig ulua, butaguchi
Amberjack	*Seriola dumerili*	kahala

* Indicates a Deep 7 bottomfish

Fishery regulations require NMFS to specify ACLs for both the MHI Deep 7 bottomfish and the non-Deep 7 bottomfish stock complexes and implement the ACLs along with AMs. For management purposes, the fishing year for the MHI Deep 7 bottomfish begins on September 1 and ends on August 31 the following year. For non-Deep 7 bottomfish, the fishing year begins January 1 and ends on December 31. See 50 CFR 665 – Subpart C for federal regulations

[1] Historically the fisheries for Hawaii BMUS operated in two management subareas: (1) the inhabited MHI, and (2) 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 the Presidential Proclamation establishing the Papahanaumokuakea Marine National Monument (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.

applicable to bottomfish fishing in Hawaii. Fishermen must comply with federal requirements for vessel identification, non-commercial fishing permits, non-commercial catch and effort logbooks, and a non-commercial bag limit of five Deep 7 bottomfish per trip.

The State of Hawaii also regulates state-registered fishing vessels and requires the owners of a commercial or non-commercial vessel used to fish for bottomfish to annually register their vessel with the Hawaii Department of Land and Natural Resources (DLNR). State law requires all commercial fishermen to annually obtain a commercial marine license (CML) and report all catch within five days after the end of each fishing trip. State law also prohibits bottomfish fishing in 12 bottomfish restricted fishing areas, established by the state for bottomfish conservation purposes. Additionally, when NMFS projects the fishery will reach the ACL, Hawaii law authorizes the DLNR to implement complementary AMs (i.e., in-season fishery closure) in state waters 0-3 nm from shore. See the DLNR website for all state regulations applicable to bottomfish fishing in Hawaii (http://dlnr.hawaii.gov/dar/).

1.1 Overview of ACL Specification Process

Federal regulations at 50 CFR 665.4 require NMFS to specify an ACL and AM for all Hawaii BMUS, as recommended by the Council, and consider the best available scientific, commercial, and other information about the fishery for that stock or stock complex. This section provides an overview of the ACL specification process the Council used to develop its recommendation.

In accordance with the Magnuson-Stevens Act and the FEPs, there are three required elements in the development of an ACL specification. The first requires the Council's 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 consideration of different levels of scientific information. Tiers 1-2 involve data rich to data moderate situations and include levels of scientific uncertainty derived from model-based stock assessments. Tiers 3-5 involve data poor situations and include levels of scientific uncertainty derived from ad-hoc procedures including simulation models or expert opinion.

When calculating an ABC for a stock or stock complex, the SSC must first evaluate the information available for the stock and assign the stock or stock complex into one of the five tiers. The SSC must then apply the control rule assigned to that tier to determine ABC.
For stocks or stock complexes that have estimates of maximum sustainable yield (MSY) and other MSY-based reference points derived from statistically-based stock assessment models (Tier 1-3 quality data), the ABC is calculated by the SSC based on an ABC control rule that accounts for scientific uncertainty in the estimate of the OFL. In plain English, ABC is the maximum catch at which the probability or risk of overfishing percentile (P*) is less than 50%. In accordance with federal regulations, the probability of overfishing cannot exceed 50% and should be a lower value (50 CFR 600.310). 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, including 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 SSC recommended ABC. 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). An ACL set below the 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 annual catch target (ACT) in the system of AMs so that a fishery does not exceed the ACL. An ACT is the management target of the fishery and accounts for management uncertainty in controlling the actual catch at or below the ACL.

If the Council determines a fishery exceeded the specified ACL, the Council may recommend as an AM, that NMFS reduce the ACL in the subsequent fishing year by the amount of the overage. In determining whether an overage adjustment is necessary, the Council would consider the magnitude of the overage and its impact on the affected stock's status. Additionally, if a fishery exceeds an ACL more than once in a four-year period, the Council is required to re-evaluate the ACL process, and adjust the system, as necessary, to improve its performance and effectiveness. Figure 1 illustrates the relationship between the terms used in this section.

For more details on the specific elements of the ACL specification mechanism and process, 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, and misreporting of landings).

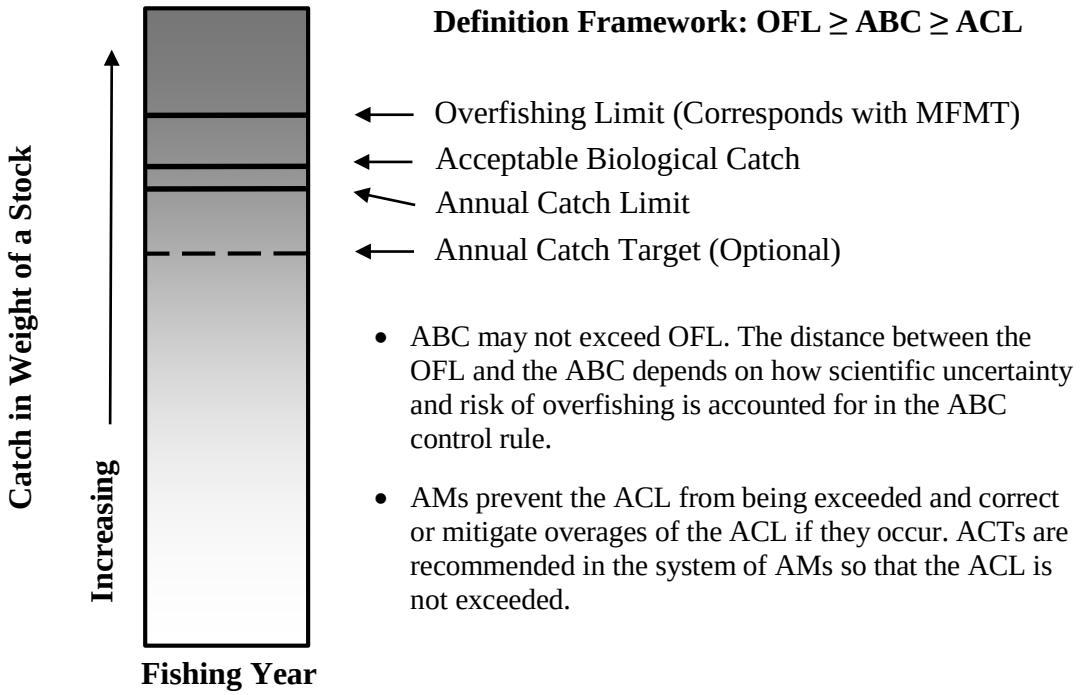


Figure 1. General relationship between OFL, ABC, ACL, and ACT

1.2 Purpose and Need for Action

The purpose of this action is to use the best available scientific information to specify an ACL for the MHI Deep 7 bottomfish stock complex each year for 2015-16, 2016-17, and 2017-18, and implement any AMs necessary to prevent catches from exceeding the ACL. ACLs and AMs are required in order for a fishery to comply with the Magnuson-Stevens Act and provisions of the Hawaii FEP and implementing regulations. The Council developed the ACL and AMs in accordance with the approved FEP mechanism and process, considering the best available scientific, commercial, and other information about the fishery, and taking into account the associated risk of overfishing. The in-season AM involves close monitoring of the catch and a closure of the fishery if the ACL reaches the ACL. The post-season AM corrects the next year's ACL by the amount of any overage, if it occurs. The fishery management objective is to specify an ACL and AMs that will prevent overfishing from occurring, and ensure long-term sustainability of Hawaii's bottomfish stocks while allowing fishery participants to continue to benefit from the managed harvest of the fishery resources.

1.3 Proposed Action

For fishing year 2015-16 (September 1, 2015, through August 31, 2016), NMFS proposes to specify an ACL of 326,000 lb of MHI Deep 7 bottomfish . NMFS will, in the future, propose to specify an ACL of 318,000 lb in the 2016-17 fishing year and 306,000 lb in the 2017-18 fishing year. NMFS monitors Deep 7 bottomfish catches based on data provided by commercial fishermen to the State of Hawaii. As an AM, NMFS proposes to close the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters on the date the NMFS

projects the fishery will reach the ACL through the end of the fishing year. During the fishery closure, no person may fish for, retain, or possess any Deep 7 bottomfish in the EEZ around the MHI. The purpose of this AM is to prevent catches in excess of the ACL. Although not part of the federal action, during a federal fishery closure, the State of Hawaii implements a complementary closure in state waters, and prohibits any person from fishing for, possessing, or selling MHI Deep 7 bottomfish after the closure date.

In addition, if NMFS and the Council determine that the final MHI Deep 7 bottomfish catch exceeds the proposed ACL in any fishing year, then NMFS would reduce the Deep 7 bottomfish ACL for the next fishing year by the amount of the overage. As the 2015-16 fishing year has already begun, NMFS proposes to retroactively count all catches of MHI Deep 7 bottomfish made since September 1, 2015, the start of the fishing year, towards the 2015-16 ACL using all available commercial data collected by HDAR through state CML reporting, and all non-commercial data collected by NMFS through federal logbook reporting. While Hawaii BMUS include other non-Deep 7 bottomfish species identified in Table 1, NMFS will propose a separate ACL and AM for the non-Deep 7 bottomfish stock complex through a separate action. Therefore, the specification of ACLs and AMs for non-Deep 7 bottomfish are not part of the proposed action.

1.4 Decisions to be Made

After considering public comments on the proposed action and alternatives considered, NMFS will specify an ACL and AM for the MHI Deep 7 bottomfish MUS for the 2015-16 fishing year. NMFS will also use the information in this EA to consider the impacts of the proposed action and alternatives considered during the 2016-17 and 2017-18 fishing year. Finally, the Regional Administrator will also use the information in this EA to make a determination about whether the selected ACL specifications and AM would be a major federal action with the potential to have a significant environmental impact that would require the preparation of an environmental impact statement.

1.5 Public Involvement

At its 163rd meeting held from June 16-18, 2015, the Council considered and discussed issues relevant to the MHI Deep 7 bottomfish ACL and AM, including the fishing level recommendations of its 119th SSC meeting held from June 9-11, 2015. The Council made their MHI Deep 7 bottomfish ACL and AM recommendations to the NMFS at the conclusion of the 163rd Council meeting. All meetings were open to the public and advertised in Hawaii media as well as the Federal Register (80 FR 30050, May 26, 2015), and on the Council's website. The Council can provide reports of the 163rd Council meeting and the 119th SSC meeting. See Section 2.1.5 and 2.1.6 for a summary of the respective recommendations of the SSC and Council from these meetings. NMFS is currently seeking public review and comments on the proposed specifications and analysis in the draft EA.

2 Description of the Alternatives Considered

The alternatives considered in this EA are limited to the ACL and AM. Although the OFL and ABC are part of the ACL mechanism, the establishment of these reference points is not part of the proposed federal action. The description of the process is for informational purposes only.

2.1 Development of the Alternatives

The alternatives considered in this EA are based upon the best available scientific, commercial, and other information about the MHI Deep 7 bottomfish fishery. Fisheries scientists from NMFS Pacific Islands Fisheries Science Center (PIFSC) compiled data from these information sources to produce a stock assessment that describes the past and current status of the MHI Deep 7 bottomfish stock complex and predicts potential effects on stock status at various levels of catch. Currently, there are two recent PIFSC stock assessments that provide information relevant to the status of MHI Deep 7 bottomfish. Both assessments are briefly summarized below.

2.1.1 2011 MHI Deep 7 Bottomfish Stock Assessment

In 2011, PIFSC completed a stock assessment for the MHI Deep 7 bottomfish fishery (2011 stock assessment) using data through 2010 (Brodziak et al., 2011). The 2011 stock assessment used similar commercial fishery data as in a 2008 assessment update (Brodziak et al., 2009), but included a modified treatment of unreported catch and a catch per unit effort (CPUE) standardization. For unreported catch, i.e., any bottomfish caught but not reported to the State of Hawaii or NMFS, the general approach for estimating unreported catch was to use all available relevant information to estimate the ratio of unreported to reported bottomfish catch in the MHI. The 2011 stock assessment also includes new data on bottomfish life history characteristics (A. Andrews, PIFSC, unpublished 2010 research), in response to recommendations from the Western Pacific Stock Assessment Review (WPSAR) of the 2008 update (Stokes, 2009). Additionally, while the 2008 assessment update considered the entire assemblage of Hawaii BMUS on an archipelagic basis (NWHI and MHI), the 2011 stock assessment focused solely on the Deep 7 bottomfish stock complex in the MHI.

To address the unreported catch issue, the 2011 stock assessment included four scenarios of unreported catch developed from available information. The four scenarios are labeled in order of magnitude from the highest (Scenario 1) to the lowest (Scenario 4) estimates of unreported catch.

- **Catch Scenario 1:** Unreported catch is 2 times commercial reported catch
- **Catch Scenario 2:** Unreported catch equals the commercial reported catch
- **Catch Scenario 3:** Unreported catch is one-fifth the commercial reported catch
- **Catch Scenario 4:** There is no unreported catch

According to the 2011 stock assessment, Catch Scenario 2 is the most plausible scenario because it used the best available information on unreported-to-reported catch ratios estimated for individual MHI Deep7 bottomfish species.

To determine the appropriate CPUE, the 2011 assessment included three scenarios to represent changes in fishing power of the fleet that targets Deep 7 bottomfish for commercial catch. CPUE is used in stock assessments as an index of relative stock abundance. Standardizing CPUE from different anglers over different areas and over many years helps to minimize the effects that could bias CPUE as an index of stock abundance.

- **CPUE Scenario 1:** Negligible change in bottomfish fishing power through time.
- **CPUE Scenario 2:** Moderate change in bottomfish fishing power through time. Specifically, this scenario assumed that:
  (i) there was no change in fishing power during 1949-1970;
  (ii) fishing power increased at a rate of 0.25% per year during 1971-1980; fishing power increased at a rate of 0.5% per year during 1981-1990;
  (iii) fishing power increased at a rate of 0.25% per year during 1991-2000; and
  (iv) fishing power did not change during 2001-2010.
- **CPUE Scenario 3:** Substantial change bottomfish fishing power through time. Specifically, this scenario assumed that a substantial change in fishing power scenario had occurred since the 1950s with an average increase in fishing power of roughly 1.2% per year.

According to the 2011 assessment, CPUE Scenario 1 is the most plausible scenario because it represented the best scientific information about the efficiency of the Deep7 bottomfish fishing fleet through time, and because it did not include ad hoc assumptions about changes in fishing power for the deep handline fishery that has traditionally harvested the Deep7 bottomfish complex.

Based on the Catch 2/CPUE 1 scenario combination, the 2011 assessment estimates an MSY of 417,000 lb for the MHI Deep 7 bottomfish stock complex. The 2011 stock assessment also included projection results of a range of commercial catches of Deep 7 bottomfish that would produce probabilities of overfishing ranging from zero to 100% and at five percent intervals (Table 19.1 in Brodziak et al., 2011, and shown in Appendix A of this draft EA). Under the Catch 2/CPUE 1 scenario combination, the catch associated with a 50% probability of overfishing is 383,000 lb of MHI Deep 7 bottomfish. Therefore, while the long-term MSY for the fishery is 417,000 lb, the OFL for fishery is 383,000 lb.

Findings of an Independent Peer Review

In January 2011, PIFSC entered into a contract with the Center for Independent Experts (CIE) to provide three independent experts to review a draft of the 2011 stock assessment and prepare a report of their independent findings and recommendations about whether the 2011 stock assessment is the best scientific information available for management purposes. In general, the CIE review panel found that the 2011 stock assessment was scientifically sound, applied appropriate modeling approaches and methods given data limitations. In addition, each reviewer provided recommendations on how to improve the next stock assessment particularly with respect to enhancing the credibility of the CPUE standardization. The reports of the CIE reviewers are available on the PIFSC website at http://www.pifsc.noaa.gov/do/peer_reviews/.

2.1.2 2014 MHI Deep 7 Bottomfish Stock Assessment Update

In 2014, fishery scientists with the PIFSC completed a draft 2014 stock assessment update for the MHI Deep 7 bottomfish fishery (2014 stock assessment), using data through fishing year 2013 (Brodziak et al., 2014). The 2014 stock assessment update uses the previous 2011 stock assessment's methods for data analysis, modeling, and stock projections, with one improvement--it included Hawaii's CML data as a variable to standardize CPUE over time. The state began issuing CMLs uniquely and consistently to individuals through time starting in 1994. Therefore, beginning in 1994 the CML number assigned to an individual has remained the same. The 2014 stock assessment included individual CMLs in the CPUE standardization for that year onward. Using CML data resulted in a two-fold increase in the explanatory power (as measured by R-squared) of the CPUE standardization and a substantial decrease in the Akaike information criterion value of the CPUE standardization. CML explains over 50% of the variation in observed CPUE over time. In the three additional years (2011-13) covered by the 2014 assessment, the biomass of the Deep 7 species and the exploitation rate were about the same as in the preceding three years. Therefore, the updated estimates of the values needed for management (i.e., MSY, OFL, probability of overfishing etc.) are not a result of any significant change in biomass or exploitation rate, but are due to better estimation of the biological reference points provided by the previous assessment.

Based on the revised CPUE standardization method and three years of additional catch data, the 2014 stock assessment update re-estimates MSY to be 415,000 lb, which is similar to the previous MSY estimate of 417,000 lb reported in the 2011 stock assessment. The 2014 stock assessment also included projection results of a range of commercial catches of Deep 7 bottomfish that would produce probabilities of overfishing ranging from zero to 100% and at five percent intervals (Table 15 in Brodziak et al., 2014). Based on a maximum potential harvest of 325,000 lb of MHI Deep 7 bottomfish in the then-ongoing 2013-14 fishing year, the 2014 stock assessment estimated an OFL of 316,000 lb, which is 67,000 lb less than the OFL estimate in the 2011 stock assessment. These updated estimates of MSY and OFL are not the result of any significant change in biomass or exploitation rate, but are due to better estimations resulting from the revised CPUE standardization method.

Findings of an Independent Peer Review

In December 2014, PIFSC again contracted the CIE to provide three independent experts to review the 2014 stock assessment, prepare a report of their independent findings and recommendations, and assist NMFS in determining whether the 2014 stock assessment is the best scientific information available for management purposes. In summary, the CIE panel found that including individual CML data as a variable to standardize CPUE over time was an improvement over the method used in the 2011 stock assessment. However, the CIE panel had strong reservations regarding the quality of input catch data and CPUE index of abundance used in both the 2011 and 2014 stock assessments. Specifically, the panel raised concern about the historical pre-1990 data for CPUE calculation and estimates of unreported catch. Given the concerns with the incomplete effort information, the CIE panel concluded that the 2014 stock assessment had flaws that compromised its utility for management (Neilson, 2015). The reports

of the CIE reviewers are available on NMFS website at http://www.st.nmfs.noaa.gov/science-quality-assurance/cie-peer-reviews/cie-review-2015.

2.1.3 Best Scientific Information Available

National Standard 2 requires that conservation and management measures be based on the best scientific information available, and be founded on comprehensive analyses. National Standard 2 guidelines state that scientific information that is used to inform decision making should include an evaluation of its uncertainty and identify gaps in the information (50 CFR 600.315(a)(1)). The guidelines also recommend scientific information used to support conservation and management be peer reviewed (50 CFR 600.315(a)(6)(vii)). However, the guidelines also state that mandatory management actions should not be delayed due to limitations in the scientific information or the promise of future data collection or analysis (50 CFR 600.315(a)(6)(v)).

On March 3, 2015, PIFSC outlined reasons why the fisheries data in the 2014 stock assessment produced results that the CIE panel advised were not ready for management application, and identified two ways to improve the fisheries data for future application in the new CPUE standardization method.

1. Although catch per day fished is the best available CPUE that is available continuously over the whole time series, it may not be the best available over the most recent time series. If we split time series with CPUE issues addressed differently before and after the split, one could also analyze and include detailed effort data from only the last dozen years. This data could strongly influence recent trends. PIFSC could not do this as a simple update in 2014, because it is a complex undertaking.

   The use of CPUE defined as catch per day fished is subject to great criticism, and one way to address this is by using details on hours and numbers of lines and hooks used by fishermen over the last dozen years. Only inexplicit, undescribed differences among fishermen linked through time were applied to the recent stanza in the 2014 CPUE standardization. Using the recent effort detail would still allow differences between individual fishermen to be standardized, and allow us to address changes in effort details through time. Both were factors of great concern to the reviewers. Differences among areas and seasons and other such factors that apply throughout the whole time series have remained part of the CPUE standardization in both 2011 and 2014.

2. We could make further efforts to apply the CPUE standardization to account for differences among fishermen to more data using various exploratory methods and other data sets. The 2014 assessment overlooked a compilation of confidential non-electronic records held by the State of Hawaii that may help to link fisher's identities back through an earlier stanza of time.

Although the CIE panel noted the improvement in catch rate standardization in the 2014 stock assessment compared to 2011, it had strong reservations regarding the input catch data in both stock assessments. However, PIFSC cannot improve the assessment for MHI Deep 7 bottomfish

in the ways described above in short order because it is a complex undertaking. Although catch per day fished may not be the best available CPUE data that can be used in the superior split-stanza CPUE standardization (i.e., after 1994), it is the best CPUE data that is available over the entire time series, and thus appropriate for use in the 2011 stock assessment approach, which does not utilize a split-stanza CPUE standardization approach. As documented by Boggs (2015, Appendix A), NMFS fishery scientists find that a simple update of the 2011 assessment using catch and effort data from the three most recent years (i.e., 2011, 2012 and 2013) provides the best scientific information available for management. Applying this updated data, NMFS revised the MSY for MHI Deep 7 bottomfish from 417,000 lb to 404,000 lb and the OFL from 383,000 lb to 352,000 lb. These values do not reflect a drastic change in stock status from the information considered by the Council, and the proposed ACL of 346,000 lb remains below the revised OFL of 352,000 lb. These numbers are the basis for the development of the alternatives under this action.

2.1.4 Estimation of OFL

OFL is an estimate of the annual amount of catch (lb) that corresponds with the maximum fishing mortality threshold (MFMT). In other words, if catch exceeds the OFL, there is a 50% probability that overfishing is occurring. OFL is a biologically-based reference point estimated by NMFS Pacific Islands Fisheries Science Center through a stock assessment. According to the 2011 stock assessment update (Brodziak et al., 2011), the Catch 2/CPUE 1 scenario combination represents the best approximation (with a 0.400 probability) of the true state of nature of the bottomfish fishery and Deep 7 bottomfish population dynamics. Under the Catch 2/CPUE 1 scenario combination with data updated through 2013, the long-term MSY of the MHI Deep 7 bottomfish stock complex is estimated to be 404,000 lb (Appendix A). The 2011 assessment model with updated data to 2013 also included projection results of a range of commercial catches of Deep 7 bottomfish that would produce probabilities of overfishing ranging from zero to 50%, and at five percent intervals (Table 2 in Boggs memo for the record dated March 3, 2015, and shown in Appendix A). Based on these results, the 2011 stock assessment model with data to 2013 estimates that the level of catch associated with a 50% probability of overfishing the MHI Deep 7 bottomfish complex is 352,000 lb. Therefore, while the long-term MSY for the fishery is 404,000 lb, the OFL for the fishery is 352,000 lb.

2.1.5 Calculation of ABC

The calculation of ABC begins with a P* working group process that systematically addresses scientific uncertainty in the stock assessment. At its 119th meeting held June 9-11, 2015, the SSC reviewed the P* working group meeting reports (the first P* meeting report is included as Appendix C). The P* working group held its first meeting on May 6, 2015. The P* working group reviewed the uncertainties in the 2011 stock assessment in light of the recent CIE review of the 2014 stock assessment update. The working group also reviewed the results of the 2011 stock assessment model updated with three years of data to 2013. The working group re-scored the first three dimensions: 1) assessment information, 2) uncertainty characterization, and 3) stock status. These were the basis for the change in the risk of overfishing levels for the MHI deep 7 bottomfish fishery from a risk of 41% in the 2014-15 fishing year to 38% in the 2015-16 fishing year.

The working group held its second meeting on June 4, 2015 and re-evaluated the Productivity and Susceptibility dimension of the fishery. After re-scoring this dimension, the P* working group recommended to the SSC a risk of overfishing level of 39%. The reports were available to the SSC. The Council can provide the reports upon request (a draft report of the P* working group meeting is attached as Appendix C).

At its 119th meeting, the SSC evaluated the different alternatives, including the potential use of the phase-in approach described in the proposed rule for the National Standard 1, 3, and 7. The proposed revision to the National Standard 1 guidelines allows for the use of a phase-in approach in the ABC control rules that would phase in changes to the ABC over a period not to exceed three years, so long as the approach prevents overfishing. The International Pacific Halibut Commission (IPHC) has used this type of "Slow Up, Fast Down (SUFastD)" approach (Hare and Clark, 2008). This approach limits abrupt fishery ACL changes from one year to the next. Fisheries managers make changes to a catch limit incrementally over three years instead of one. They may raise the ACL no more than 33.3% of the target increase in each of the three years. If they are reducing the ACL, they decrease it by no more than 50% of the target decrease in each of the three years. The method allows for ACL adjustments that provide more stability to fishing participants, yet does not jeopardize the capacity of the stock or stock complex to produce MSY on a continuing basis. The SSC recommended the use of the SUFastD approach for managing the reduced ACL for the MHI Deep 7 bottomfish fisheries over years 2015 through 2018.

2.1.6 Council ACL and AM Recommendations

Based on the recommendations of its 119th SSC, the Council at its 163rd meeting held June 16-18, 2015, in Honolulu, recommended the ACL for the MHI Deep 7 bottomfish in fishing year 2015-16 be set equal to ABC, or 326,000 lb. This level of catch is associated with a 44% probability of overfishing MHI Deep 7 bottomfish. At this meeting, the Council also recommended that in order to prevent the fishery from exceeding the ACL, NMFS utilize an in-season AM and close the fishery on the projected date that the fishery would exceed the ACL. This is a continuation of the same AM used since the 2007-08 fishing year. The 326,000 lb ACL for the 2015-16 fishing season represents the first year of a 3-year phase in approach (SUFastD) to lowering the ACL. The Council also proposed lowering the ACL to 318,000 lb for the 2016-17 fishing year and to 306,000 lb for the 2017-18 fishing year. This would, in three years' time, provide for the P* of 39% to be attained. As described above, the recommendation would provide for fishery stability, while not jeopardizing the capacity of the stock or stock complex to produce MSY on a continuing basis.

2.2 ACL Alternatives for Deep 7 Bottomfish Fisheries in the MHI

This section describes a range of ACL alternatives the Council and NMFS considered for MHI Deep 7 bottomfish fisheries in fishing year 2015-16, 2016-17, 2017-18 and expected fishery outcomes. Table 2 summarizes the alternatives considered, including their associated probability of overfishing risk percentiles (P*) based on risk projections from the 2011 stock assessment with updated data to 2013 (Table 2 in Boggs memo for record dated March 3, 2015, and shown in Appendix A). 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 (50 CFR 600.310). We describe each alternative in more detail in this section.

Table 2. Summary of ACL alternatives and associated probability of overfishing (P*) percentile for MHI Deep 7 bottomfish, including MSY-based reference points. Updated values for MSY, OFL, and the ABC at various P* are based on the Boggs memo (2015, Tables 1 through 3 in Appendix A).

Main Hawaiian Islands Deep 7 Bottomfish Annual Catch Limit Specification Alternati ves for 2015-16, 2016-17, and 2017 -18						
***MSY = 404,000* lb; *OFL = 352,000 lb (P*=50%)* From Tables 1 and 2 in Boggs Memo**						
***ACL_{14-15} = 346,000 lb (P*=41%)* – Based on Brodz iak et al., 2011**						
ACL_{15-16} = To be determined. Alternatives below.						
	FY 2015-2016		***FY 2016-2017***		***FY 2017-2018***	
	ACL (lb)	***P****	***ACL (lb)***	***P****	***ACL (lb)***	***P****
Alternative 1 (No Action)	No ACL	NA	No ACL	NA	No ABC	NA
Alternative 2 (Status Quo – implement 2014-15 ACL in all 3 yr)	346,000	48-49	346,000	48-49	346,000	48-49
Alternative 3 (P* level using updated data and implement the same ACL for next 3 yr)	306,000	39	306,000	39	306,000	39
Alternative 4 (Preferred) (P* level using updated data and implement ACL using a phase-in approach to attaining preferred P* level)	326,000	44	318,000	42	306,000	39
Alternative 5 (P* level using updated data and implement ACL lower than the preferred P* level)	270,000	30	270,000	30	270,000	30

See section 2.2 for full descriptions of alternatives.

2.2.1 Alternative 1: No ACL and AM Management (No Action)

Under alternative 1, the Council would not specify an ACL or AMs for the MHI Deep 7 bottomfish fishery for the 2015-18 fishing year. This is the NEPA no ACL alternative and is what would happen in the cases in which NMFS does not specify an ACL (no agency management action). This alternative would not comply with the Magnuson-Stevens Act or the provisions of the Hawaii FEP and implementing federal regulations, which require NMFS to specify an ACL and AMs for all stocks and stock complexes, including the MHI Deep 7 bottomfish stock complex.

Expected Fishery Outcome

Under this alternative, we do not expect the MHI Deep 7 bottomfish fishery to change its conduct because of a lack of an ACL or AM. The fishery has not changed much over many decades.

The fishery is expected to harvest below the estimated OFL of 352,000 lb and long-term MSY of 404,000 lb. Even at the highest level of catch, in 2013-14, the fishery caught 309,485 lb of MHI Deep 7 bottomfish, which remains below the estimated OFL and MSY. The commercial fishery has remained at or below 475 commercial participants since catch limits were implemented in 2008 (Table 6). MHI Deep 7 bottomfish landings for the 2014-15 fishing year were 303,738 lb by 405 fishermen, who took 2,852 trips and sold 267,997 lb for a total of $1,815,332 (http://www.wpcouncil.org/wp-content/uploads/2013/04/MHI201500904_1415_Sum.pdf).

2.2.2 Alternative 2: Specify an ACL of 346,000 lb based on the 2011 Stock Assessment with no updated data (Status Quo/NEPA Baseline)

Under Alternative 2, the Council would specify an ACL of 346,000 lb for the 2015-16, 2016-17, and 2017-18 fishing year. This is the ACL previously recommended by the Council for fishing year 2012-13 (77 FR 56791, September 11, 2012), fishing year 2013-14 (78 FR 59626, September 27, 2013), and fishing year 2014-15 (80 FR 31863, June 4, 2015). This is the NEPA Status Quo (no change) baseline alternative. This alternative represents a continuation of last year's ACL.

Based on the probability of overfishing projections contained in the 2011 stock assessment (Table 19.1 in Brodziak et al., 2011 and shown in Appendix B), an annual catch of 346,000 lb is associated with a 41% probability of overfishing the MHI Deep 7 bottomfish stock complex. The 2011 stock assessment is no longer the best scientific information available. The 2011 stock assessment updated with three additional year of data is the best scientific information available (Appendix A). Using that stock assessment update, an ACL of 346,000 has a 48.5% probability of overfishing (Table 3 in Appendix A).

As an AM to prevent the fishery from exceeding the ACL, the Council recommended NMFS close the commercial and non-commercial fisheries harvesting MHI Deep 7 bottomfish in federal waters on the date NMFS projects the fishery would reach the ACL and through the end of the fishing year. Although not part of this action, during a federal fishery closure, the State of

Hawaii implements a complementary closure in state waters, and prohibits any person from fishing for, possessing or selling MHI Deep 7 bottomfish after the closure date. As an additional AM, if NMFS and the Council determine the fishery exceeded the ACL in any fishing year, the Council would recommend NMFS to reduce the ACL for the subsequent year by the amount of the overage.

Alternative 2 is the status quo ACL alternative and the NEPA baseline to compare with all other alternatives. It should be noted that this alternative, with its P* of 41% (which is actually 48-49% when using the BSIA), exceeds the recommended ABC associated with a P* of 39%.

Expected Fishery Outcome

Under Alternative 2, the specification of an ACL of 346,000 lb and the associated AM are not expected to result in changes in the conduct of the fishery, including gear types used, areas fished, level of catch or effort. This is because total reported catch in 2015-16 is expected to be similar to 2013-14 catch (i.e., 309,485 lb) and 2014-15 catch (i.e., 303,738 lb), and remain below the ACL of 346,000 lb. Thus, the in-season AM of a fishery closure to prevent the ACL from being exceeded is not likely to be triggered as would occur under Alternative 1, the fishery is expected to remain open for the entire fishing year (e.g., from September 1 to August 31 the following year). However, if the fishery were to attain the ACL of 346,000 lb in 2015-16, 2016-17, or 2017-18, NMFS would implement a fishery closure of the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters. When this occurs, the State of Hawaii implements a complementary fishery closure in state waters. The in-season AM of a fishery closure is expected to keep total catch of MHI Deep 7 bottomfish below the OFL of 352,000 lb and prevent overfishing.

Because state and federal laws require fishermen to report on a per-trip basis, management uncertainty (i.e., late reporting) is unlikely to cause the fishery to exceed the ACL of 346,000 lb. Thus, an overage adjustment AM in 2015-16, 2016-17, and 2017-18 is not likely to be necessary. However, if the fishery does exceed the ACL in any fishing year, NMFS would reduce the ACL in the next fishing year by the amount of the overage.

In the short term, there would be no change to the fishery. However, this alternative would assume a much higher risk of overfishing than alternatives three through five. The fishery operated under an ACL of 346,000 lb in previous fishing years when the BSIA indicated a catch of that size would assume a 41% risk of overfishing, but the current BSIA indicates that an annual catch of 346,000 lb would be a 48-49% risk of overfishing. While 346,000 lb would not exceed the OFL of 352,000 lb, the risk of overfishing is much higher than the 39% risk of overfishing recommended by the P* working group and the SSC.

2.2.3 Alternative 3: Specify an ACL of 306,000 lb based on the 2011 Stock Assessment with updated data to 2013 and no phase-in

Under Alternative 3, based on the Council's recommendations, NMFS would specify an ACL of 306,000 lb of MHI Deep 7 bottomfish for the 2015-16, 2016-17, and 2017-18 fishing year. As an AM to prevent the fishery from exceeding the ACL, the Council recommended NMFS close the

commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters on the date NMFS projects the fishery would reach the ACL and through the end of the fishing year. When this occurs, the State of Hawaii implements a complementary fishery closure in state waters. As an additional AM, if the NMFS and the Council determine the fishery exceeded the ACL in any fishing year, NMFS would reduce the following year's ACL by the amount of the overage. This alternative does not use a phase-in approach, so unless changed the ACL and the AM are the same each year.

Based on the probability of overfishing projections contained in the update of 2011 benchmark stock assessment of MHI Deep 7 bottomfish with data through 2013 (Appendix A), an annual catch of 306,000 lb is associated with a 39% probability of overfishing. The P* working group re-evaluated the scientific uncertainty around the 2011 assessment as a result of the recent CIE review that highlighted uncertainties in the model, assumptions and data that went into the assessment. The P* working group met on May 6, 2015, and June 4, 2015, and recommended a risk of overfishing level of 39% for the MHI Deep 7 bottomfish fishery (Appendix C). Based on this recommendation, this level of harvest is sustainable over the long term.

Expected Fishery Outcome

This would be a lower ACL than has been specified for the past four years. Under Alternative 3, the fishery is not likely to reach the ACL of 306,000 lb if the fishery performance is average relative to the fishery performance over the past four years (Table 6). However, if catches are as large as they were in 2013-14, when the fishery caught 309,485 lb, there is potential for the fishery to reach 306,000 lb and trigger an in-season closure (Table 6). If the fishery performs closely to the 2013-14 fishing year, the fishery can potentially close around early to mid-August (Table 11). If bottomfish fishermen catch the maximum landings reported for each month historically, the level of catch would result in a 5-mo fishery closure starting early April and lasting through the end of August (Table 13).

However, if the fishery were to attain the ACL of 306,000 lb in 2015-16, 2016-17, and 2016-18, the Council recommended that NMFS implement a fishery closure of the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters. When this occurs, the State of Hawaii implements a complementary fishery closure in state waters. The in-season AM of a fishery closure is expected to keep total catch of MHI Deep 7 bottomfish below the OFL of 352,000 lb and prevent overfishing.

Because state and federal laws require fishermen to report on a per trip basis, management uncertainty (i.e., late reporting) is unlikely to cause the fishery to exceed the ACL of 306,000 lb. Thus, an overage adjustment AM in 2016-17 is not likely to be necessary.

2.2.4 Alternative 4: Specify an ACL of 326,000 lb, 318,000 lb, and 306,000 lb for fishing year 2015-16, 2016-17, and 2017-18, respectively, using a Slow-Up Fast-Down phase-in approach (Council Preferred Alternative)

Under Alternative 4, based on the Council's recommendation, NMFS would specify an ACL of 326,000 lb, 318,000 lb, and 306,000 lb of MHI Deep 7 bottomfish for fishing year 2015-16,

2016-17, and 2017-18, respectively. As an AM to prevent the fishery from exceeding the ACL, the Council recommended NMFS close the commercial and non-commercial fisheries harvesting MHI Deep 7 bottomfish in federal waters on the date NMFS projects the fishery would reach the ACL and through the end of the fishing year. Although not part of this action, during a federal fishery closure, the State of Hawaii implements a complementary closure in state waters, and prohibits any person from fishing for, possessing or selling MHI Deep 7 bottomfish after the closure date. As an additional AM, if NMFS and the Council determine the fishery exceeded the ACL in any fishing year, the Council would recommend for NMFS to reduce the ACL for the subsequent year by the amount of the overage.

Based on the probability of overfishing projections contained in the update of 2011 benchmark stock assessment of MHI Deep 7 bottomfish using data through 2013 (Appendix A) an ACL of 326,000 lb, 316,000 lb, and 306,000 lb are associated with a 44, 42, and 39% probability of overfishing, respectively. This alternative is a balanced approach. The use of a phase-in approach allows for gradually decreasing catches that are all well below the newly-defined OFL of 352,000 lb, but avoids a sudden 40,000 lb reduction of the ACL from a 2014-15 ACL of 346,000 lb to a 2015-16 ACL of 306,000 lb.

Expected Fishery Outcome

Alternative 4 is the Council's preferred alternative. It differs from Alternative 3 in the use of a phase-in approach to reducing the ACL. Under Alternative 4, the specification of ACLs of 326,000 lb and 318,000 lb in fishing year 2015-16 and 2016-17, respectively, is not expected to result in changes in the conduct of the fishery, including gear types used, areas fished, level of catch or effort. This is because total reported catch in these fishing years are expected to be similar to the 2013-14 catch (i.e., 309,485 lb) and 2014-15 catch (i.e., 303,738 lb), and remain below the said ACLs. Thus, the in-season AM of a fishery closure to prevent the ACL from being exceeded is not likely to be triggered and the fishery is expected to remain open for each of these fishing years.

For fishing year 2017-18, the fishery would not reach the ACL of 306,000 lb if the fishery performance is equal to the average fishery performance over the past three years (Table 6). If the fishery performs similar to the 2013-14 fishing year, however, the fishery could potentially close around early to mid-August (Table 11). If the fishery performance peaks and trends maximum landing each month, this level of catch would result in a five month potential fishery closure starting early April through the end of August (Table 13).

If the fishery reached 306,000 lb in the 2017-18 fishing year, this would trigger the in-season closure of the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters and the complementary closure in state waters. This in-season AM closure is expected to keep total catch of MHI Deep 7 bottomfish from exceeding the ACL and to prevent overfishing from occurring.

Because state and federal laws require fishermen to report on a per trip basis, it is unlikely that management uncertainty (i.e., late reporting) would occur and cause the fishery to exceed the ACL of 306,000 lb. Thus, an overage adjustment AM in the following fishing year is not likely

to be necessary. However, in the unlikely event the fishery exceeds an ACL set at 306,000 lb, NMFS would reduce the ACL the following year by the amount of the overage.

2.2.5 Alternative 5: Specify an ACL of 270,000 lb based on the 2011 Stock Assessment with updated data to 2013 and no phase-in

Under Alternative 5, NMFS would specify an ACL of 270,000 lb of MHI Deep 7 bottomfish for the 2015-16, 2016-17, and 2017-18 fishing year. As an AM to prevent the fishery from exceeding the ACL, the Council recommended NMFS close the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters on the date NMFS projects the fishery would reach the ACL and through the end of the fishing year. Although not part of this action, during a federal fishery closure, the State of Hawaii implements a complementary closure in state waters, and prohibits any person from fishing for, possessing or selling MHI Deep 7 bottomfish after the closure date. As an additional AM, if NMFS and the Council determine the fishery exceeded the ACL in any fishing year, the Council would recommend NMFS to reduce the ACL for the subsequent year by the amount of the overage.

Based on the probability of overfishing projections contained in the update of 2011 benchmark stock assessment of Deep 7 bottomfish In the Main Hawaiian Islands using data through 2013 (Boggs memo for the record dated March 3, 2015, and the supplemental table dated May 19, 2015), an ACL of 270,000 lb is associated with a 30% probability of overfishing.

Expected Fishery Outcome

This alternative is lower than the recommended ACL and is included in this EA because it allows NMFS to evaluate the impacts of an alternative that sets the ACL much lower than other alternatives. Under Alternative 5, based on recent average performance in the fishery, the fishery would be expected to reach the ACL of 270,000 lb by the end of April to early May - see trend of MHI Deep 7 bottomfish catches in the 2013-14 fishing year (Table 11, HDAR unpublished data, available at NMFS). If the fishery performance is similar to an average of the last four fishing years (270,079 lb), an ACL of 270,000 may result in a closure (Table 6). However, if the fishery catches the maximum landings ever caught for each month, an ACL of 270,000 lb would result in a 6 month fishery closure closing some time around February to March – the months in which the fishery has landed between 265,558 lb and 301,332 (Table 12).

If the fishery reached 270,000 lb in the fishing year 2015-16, 2016-17, or 2017-18, this would trigger the in-season closure of the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters and the complementary closure in state waters. This in-season AM closure is expected to keep total catch of MHI Deep 7 bottomfish below the OFL of 352,000 lb and prevent overfishing from occurring.

However, the state and federal laws require fishermen to report on a per trip basis, it is unlikely that management uncertainty (i.e., late reporting) would occur and cause the fishery to exceed the ACL of 270,000 lb. Thus, an overage adjustment AM in the following is not likely to be

necessary. However, in the unlikely event the fishery exceeds an ACL set at 270,000 lb, NMFS would reduce the ACL in the following by the amount of the overage.

3 Affected Environment

This section describes the biological and physical resources that could be affected by MHI Deep 7 bottomfish fisheries under the proposed action.

3.1 Target and Non-Target Species

The MHI bottomfish fishery harvests an assemblage, or complex, of 14 species that include nine snappers, four jacks (trevally) and a single species of grouper (Table 1). However, the target species of the fishery, and the species of primary management concern are six deep-water snappers and one grouper, the "Deep 7 bottomfish" described above.

3.1.1 Deep 7 Bottomfish

There is a limited amount of quantitative information on the life history parameters of the Deep7 bottomfish, and in particular, the early life stages and juvenile characteristics are not well described. Adults tend to inhabit deep waters of roughly 100-400 m depth in the MHI although some species (e.g., opakapaka) may shoal to mid-water depths to feed. The paragraphs below in this section are drawn from WPFMC and NMFS (2007) and are intended to provide the reader with basic information about seven Deep 7 bottomfish species.

Onaga: Large specimens of onaga will reach at least three feet in length and weigh up to 30 pounds (lb). They inhabit deep, rocky bottoms offshore and are known to occur between 80 and 250 fathoms (fm). Onaga are commonly caught off the bottom or in areas of steep drop-offs, ledges, and pinnacles. Onaga feed on small fishes, squids, and crustaceans, and are thought to reach sexual maturity at about 21 inches (in) and 5 lb, at approximately five years of age. Females with ripe ovaries have been reported during August and September. Onaga are distributed throughout the Indo-Pacific region.

Ehu: Adult ehu reach a length of at least 24 in and a weight of up to about 12 lb. They inhabit deeper offshore water beyond the reef, mainly occurring over rocky bottoms, usually between 80 and 218 fm. They feed on fishes and larger invertebrates such as squids, shrimps, and crabs, and reach sexual maturity at about 11.7 in fork length, or one pound in weight, at approximately three years of age. Ehu spawn in the NWHI from July – September, according to a study by Everson (1984). Ehu are distributed throughout the Indo-Pacific region.

Kalekale: Large specimens of kalekale can reach up to 24 in length and 6 lb in weight. Commonly, they are found at around 12 in long. They inhabit deeper offshore water beyond the reef, occurring over rocky bottoms usually between 40 and 200 fm. They feed on fish, shrimps, crabs, polychaetes, cephalopods, and urochordates. Fish of 14 in fork length are approximately two lb in weight and five years old. Kalekale are distributed throughout the Indo-Pacific region.

Opakapaka: Large specimens reach a length of at least three feet and weigh up to about 20 lb. They inhabit deeper offshore water beyond the reef, occurring over rocky bottoms, usually between 40 and 120 fm. Fish apparently migrate into shallower depths near 40 fm at night. They feed on small fishes, squids, shrimps, crabs, pyrosomes, and zooplankton. Sexual maturity is reached at about 1.8 years and they generally spawn at about 2.2 years (1.5 lb, 13 in fork length). Their spawning season in the NWHI was determined in a 1980 study to be from June – December with peak spawning in August (Kikkawa, 1980). Previous research on the age and growth of opakapaka estimated a maximum age of 18 years (Ralston and Miyamoto, 1983). However, recent ageing research based on bomb radiocarbon and lead radium decay dating of archival otolith samples indicate that this species has a life span on the order of 40 years (A. Andrews, PIFSC, unpublished data, in Brodziak et al., 2011). Information on the expected natural mortality rate (M) of opakapaka was estimated to be 0.25, based research from the research thesis of Martinez-Andrade (2003).

Gindai: Gindai will reach up to 20 inches in length and six lb in weight. They inhabit deeper offshore water beyond the reef, occurring over rocky bottoms, usually between 60 and 130 fm. They feed on fishes, shrimps, crabs, cephalopods, and other invertebrates. Gindai are distributed throughout the Indo-Pacific region.

Lehi: Large lehi specimens will reach a length of at least three feet and weigh up to about 30 lb. They inhabit reefs and rocky bottom areas usually between 60 and 100 fm. They feed on fish, squid, and crustaceans. Lehi are distributed throughout the Indo-Pacific region.

Hapuupuu: This grouper reaches lengths of up to four feet and weighs up to 60 lb. They occur in waters 11 to 208 fm deep. They feed mainly on fish and crustaceans. The hapuupuu is endemic to the Hawaiian Islands and Johnston Island.

Table 3 summarizes the annual reported commercial catches of MHI Deep 7 bottomfish catch by species from 2000-2013. Note that the data in Table 3 covers the HDAR fiscal year, which begins July 1 and ends June 30 the following year. For ACL management, NMFS and the Council monitor MHI Deep 7 bottomfish catches based on the fishing year, which begins September 1 and ends August 31, the following year. See Table 6 for annual reported catches of all MHI Deep 7 bottomfish combined by fishing year.

Table 3. Reported MHI Deep 7 bottomfish catch in pounds by species (2000-13)

Year	Hapuupuu	Kalekale	Opakapaka	Ehu	Onaga	Lehi	Gindai	Total
2000	13,100	15,900	165,900	26,700	72,100	11,100	3,200	308,000
2001	15,400	15,300	124,800	26,500	62,900	11,500	3,600	260,000
2002	9,000	10,300	103,500	16,900	59,600	10,800	2,400	212,400
2003	9,400	12,000	127,700	16,300	68,800	8,500	2,100	244,800
2004	7,900	8,000	87,200	19,200	75,700	4,900	2,100	205,000
2005	10,400	7,800	104,400	22,600	89,600	6,900	2,000	243,700
2006	7,200	5,200	72,100	18,700	74,100	6,300	1,600	185,300
2007	7,500	6,100	92,400	19,400	85,500	8,400	2,300	221,700
2008	6,600	5,500	96,200	18,200	55,700	11,000	2,800	196,000
2009	7,900	9,600	132,900	24,500	59,200	16,700	3,600	254,500
2010	8,200	8,200	105,400	24,700	57,900	6,100	2,800	213,400
2011	8,200	9,900	148,400	24,500	67,700	11,600	3,100	273,400
2012	9,100	11,300	105,100	25,700	52,600	7,900	3,700	215,300
2013	10,500	12,300	95,700	30,100	66,900	13,000	3,400	231,900

Source: Table 4 in Brodziak et al., 2014

Stock Status for MHI Deep 7 Bottomfish

Under the Hawaii FEP (WPFMC 2009) and implementing regulations at 50 CFR 665.4 (76 FR 37286, June 27, 2011), bottomfish overfishing occurs when the fishing mortality rate (F) for one or more year is greater than the fishing mortality rate that produces MSY (F_{MSY}). This threshold is termed the maximum fishing mortality threshold (MFMT) and is expressed as a ratio, F/F_{MSY} = 1.0. Thus, if the F/F_{MSY} ratio is greater than 1.0 for one year or more, overfishing is occurring. A stock is considered overfished when its biomass (B) has declined below the level that jeopardizes the capacity of the stock to produce MSY on a continuing basis (B_{MSY}). This threshold is termed the minimum stock size threshold (MSST). For MHI Deep 7 bottomfish, the Hawaii FEP sets MSST at (1-M) multiplied by $B_{MSY,}$ if *M* (the natural mortality of the stock) is less than or equal to 0.5. If M is greater than 0.5, the Hawaii FEP sets MSST at a default of 0.5 multiplied $B_{MSY.}$

Because of the limited quantitative information on life history parameters of Deep 7 bottomfish, the 2011 NMFS stock assessments assumes the natural mortality rate estimate for opakapaka *(M*=0.25) to be representative of all stocks in the Deep 7 bottomfish stock complex (Brodziak et al., 2011). The assessment further noted that opakapaka is the most numerically abundant species in the complex and has historically accounted for the highest proportions of reported landings Therefore, expressed as a ratio, the MHI stock complex is considered overfished when B/B_{MSY} <0.75.

Results of the 2011 stock assessment indicate that the MHI Deep 7 bottomfish stock complex was not experiencing overfishing in 2010 as F_{2010}/F_{MSY}=0.58. The assessment also indicated that the MHI Deep 7 bottomfish stock complex was not overfished in 2010 as B_{2010}/B_{MSY} = 0.92. However, the 2011 assessment indicated MHI Deep 7 bottomfish biomass declined below the

biomass necessary to produce MSY (B_{MSY}) starting in 1990 and has remained below this level since (Brodziak et al., 2011; Table 17.1).

3.1.2 Non-Deep 7 Bottomfish

In addition to the Deep 7 bottomfish, the fishery also harvests four species of jacks and three snappers. Termed the "Non-Deep 7 bottomfish", the non-Deep 7 stock complex includes the white ulua, black ulua, kahala, butaguchi , uku, taape, and kalekale (Table 1).

Uku is the primary non-Deep 7 bottomfish species harvested and accounts for approximately 80% of the total non-Deep 7 bottomfish catch annually. While uku is caught during bottomfish fishing operations, it is caught primarily on troll gear. The next most commonly caught and retained non-Deep 7 species are white ulua, black ulua, and butaguchi. Catches of yellow kalekale are insignificant relative to other species. Kahala are generally not retained because of concerns with ciguatera and parasitic worms in the flesh. Taape are generally not retained because they are introduced snappers that are not a preferred food fish. Fishermen receive little to no money for taape.

Table 4 provides a summary of the annual reported commercial catch of MHI non-Deep 7 bottomfish by species (excluding taape and kahala) between the years 2000-2013. Note that unlike MHI Deep 7 bottomfish, the fishing year for non-Deep 7 bottomfish is the calendar year. Uku is the primary non-Deep 7 bottomfish species harvested and accounts for approximately 80% of the total non-Deep 7 bottomfish catch annually, followed by white ulua, black ulua, and butaguchi. Catches of kalekale are insignificant relative to other species.

Catches of non-Deep 7 bottomfish have generally increased from 2000-2014, including a record high landing of 158,245 lb in 2013. Anecdotal information suggests that the increase, driven primarily by catches of uku, was a result of NMFS implementation of a catch limit system in 2007-08. In fishing years 2007-08 to 2009-10, NMFS closed the MHI Deep 7 bottomfish fishery each year to prevent the fishery from exceeding the specified catch limit (Table 6). This resulted in an increased catch of uku to meet market demand for a substitute for Deep 7 bottomfish. With a new market for uku, catches of uku have remained near or above 100,000 lb since 2010 (Table 4).

Table 4. Non-Deep 7 bottomfish annual reported commercial catches in pounds (2000-14)

Fishing Year 1 Jan – 31 Dec	Uku	Butaguchi	Black ulua	White ulua	Yellowtail kalekale	Total (lb)
2000	83,318	2,947	73	4,044	0	90,382
2001	58,436	1,814	122	4,199	5	64,576
2002	57,155	1,659	421	4,183	1	63,420
2003	45,704	1,635	1,180	12,873	0	61,391
2004	76,815	1,394	1,034	14,112	43	93,399
2005	63,505	1,493	453	11,213	25	76,688
2006	59,569	298	267	9,076	32	69,241
2007	68,953	880	773	26,722	0	97,328
2008	92,872	1,193	405	15,856	6	110,331
2009	87,175	1,083	549	13,794	35	102,636
2010	123,250	772	3,348	17,986	27	145,383
2011	109,497	1,385	1,554	18,904	51	131,391
2012	101,758	742	827	12,368	0	115,695
2013	138,822	1,028	1,155	17,240	0	158,245
2014	97,043	472	548	11,983	60	110,106

Source: Catch data for 2000-2011 obtained from NMFS (2013), catch data for 2012-2014 obtained from NMFS WPacFIN website: http://www.pifsc.noaa.gov/wpacfin/hi/dar/Pages/hi_data_3.php, accessed 10/16/2015.

Stock Status for MHI Non-Deep 7 Bottomfish

NMFS has not prepared a stock assessment for the MHI non-Deep 7 bottomfish stock complex. Therefore, stock status of MHI non-Deep 7 bottomfish relative to the status determination criteria for overfishing (F/F_{MSY}) and overfished (B/B_{MSY}) reference points are unknown. However, Sabater and Kleiber (2014) recently estimated MSY and OFL for this complex based on a modeling approach that uses commercial catch data from Hawaii as described above; together with a measure of population growth (r), carrying capacity (k), and biomass data from NMFS PIFSC underwater fish census surveys (Williams 2010). This model, termed the "Biomass Augmented Catch-MSY" model creates annual biomass projections from a set of r and k combinations that would not result in biomass that would exceed the carrying capacity or the stock being depleted.

Based on the Biomass Augmented Catch-MSY model, Sabater and Kleiber (2014) estimate MSY for MHI non-Deep 7 bottomfish to be 265,000 lb. However, catch projection results from the model estimate the level of catch associated with a 50% probability of exceeding MSY to be 259,200 lb. Consistent with National Standard 1 guidelines, the Council at its 160th meeting, set OFL for MHI non-Deep 7 bottomfish equal to the level of catch associated with a 50% probability of exceeding MSY.

3.1.3 Bycatch in the MHI Deep 7 Bottomfish Fisheries

As is the case for most fisheries, some of the catch are 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.

Bycatch (i.e., discards) information from the MHI commercial bottomfish fishery has been summarized from catch and effort data submitted to HDAR by MHI commercial bottomfish fishery participants during 2003 and 2004. Overall, fishing for Deep 7 bottomfish is target-specific, and the bycatch rate of non-BMUS is relatively low, with 8.5% of the catch reported as not retained either because it was either lost or deliberately discarded (Kawamoto and Gonzales, 2005).

The majority of the MHI Deep 7 fishery's bycatch is composed of jacks (kahala, butaguchi and white ulua). Kahala were released likely because the fish are known to be ciguatoxic and have little or no market value in Hawaii (WPFMC and NMFS, 2007). For example, in 2013, fishermen caught 13,194 lb of kahala, of which they sold 1,739 lb (NMFS unpublished data at http://www.pifsc.noaa.gov/wpacfin/reportlanding.php, accessed December 12, 2014). Other than these data, there is no recent bycatch information for the MHI Deep 7 bottomfish fishery.

Sharks may be incidentally hooked by fishermen fishing for Deep 7 bottomfish. Sharks are attracted to baited hooks. However, NMFS has no evidence that sharks are killed in the fishery. Bycatch of sharks does not result in mortality because 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 and NMFS, 2007). Additionally, when shark depredation occurs, fishermen generally move to another area to avoid losing more fish to sharks.

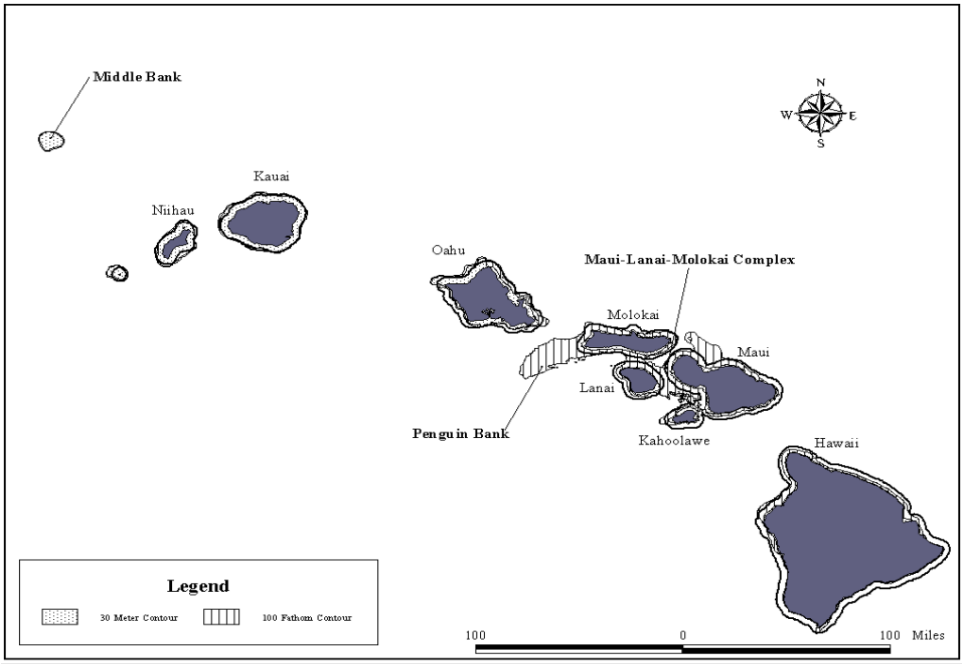
Additionally, the Hawaii FEP includes five non-regulatory measures aimed at further reducing bycatch and bycatch mortality and improving bycatch reporting in MHI bottomfish fisheries. They include: (1) outreach to fishermen and engagement of fishermen in management, including research and monitoring in order to raise their awareness of bycatch issues and options to reduce bycatch and bycatch mortality; (2) research into fishing gear and method modifications to reduce bycatch and bycatch mortality; (3) research into the development of markets for discarded fish species; (4) improvement of data collection and analysis systems to better measure bycatch; and (5) training and outreach in methods to reduce the mortality of released fish due to barotrauma (WPFMC, 2009). These non-regulatory measures will continue in the fishery, regardless of the ACL that is specified.

3.2 MHI Bottomfish Habitat

3.2.1 Bottomfish Habitat

In Hawaii, commercially important deepwater bottomfish are found along the deep slopes of island coasts and banks at depths of 100 to 400 m (55 to 218 fm). Because of the volcanic nature of the islands within the Hawaiian archipelago, most bottomfish habitat occurs in steep slope

areas on the margins of the islands and banks. Mapping of bottomfish habitat in the MHI has shown that approximately 47% of the bottomfish habitat lies in state waters (Parke, 2007). Bottomfish fishing grounds within federal waters (3 to 200 nm offshore) around the MHI include Middle Bank located northwest of Kauai, most of Penguin Bank located between Oahu and Molokai, and habitat within the Maui–Molokai–Lanai complex (see Fig. 2).



Source: WPFMC and NMFS 2007

Figure 2. General location of bottomfish habitat in the MHI

Specific bottomfish fishing locales favored by fishermen vary seasonally according to sea conditions and the availability and price of target species. An analysis of average annual reported commercial catches of MHI Deep 7 bottom in HDAR fiscal years 2010-2013 indicate that the island group of Maui, Molokai (including Penguin bank) and Lanai account for the majority of the catch (64%), followed by Hawaii Island (21%), Kauai (9%) and Oahu (6%). (Brodziak et al., 2014).

3.2.2 Essential Fish Habitat and Habitat Areas of Particular Concern

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 the marine areas and their chemical and biological properties that are utilized by the organism. Substrate includes sediment, hard bottom, and other structural relief underlying the water column along with 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 Deep 7 bottomfish.

Ten years later, in 2009, the Council developed and NMFS approved five new archipelagic-based FEP. The FEP incorporated and reorganized elements of the Councils' species-based FMPs into spatially-oriented management 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. The designated areas of EFH and HAPC for all Hawaii FEP MUS by life stage are summarized in Table 5.

At its 154th meeting held June 2012, the Council recommended Amendment 4 to the Hawaii FEP to refine the EFH descriptions for individual species of bottomfish and seamount groundfish and modify the extent of HAPC designations for these management units. The recommended revisions would not change the overall designation of EFH shown in Table 5 below. While the Council recommended additional HAPC be added, such designations are a subset of EFH and do not result in any changes to management or administrative requirements. Until Amendment 4 to the Hawaii FEP is transmitted for Secretarial review, and approved by the Secretary, the EFH/HAPC designations summarized in Table 5 below remain in effect.

Table 5. Essential Fish Habitat and Habitat Areas of Particular Concern for Hawaii bottomfish

MUS	Species Complex	EFH	HAPC
Bottomfish MUS	**Deep 7 bottomfish species:** ehu onaga opakapaka kalekale gindai hapuupuu lehi **Non-Deep 7 bottomfish species:** uku white ulua black ulua butaguchi kahala taape yellowtail kalekale	**Eggs and larvae:** the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 400 m (200 fm) **Juvenile/adults:** the water column and all bottom habitat extending from the shoreline to a depth of 400 m (200 fm)	All slopes and escarpments between 40–280 m (20 and 140 fm) Three known areas of juvenile opakapaka habitat: two off Oahu and one off Molokai

Source: WPFMC, 2009.

3.3 Description of MHI Bottomfish Fisheries

3.3.1 Fishing Gear

Bottomfish fishermen generally 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. The main line is typically constructed of dacron, or 400–450-pound test monofilament, with hook leaders of 80–120-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 5–6 pounds. The hook leaders are typically 2–3 feet long and separated by about 6 feet along the main line. Hooks can be baited with fish such as aku (*Katsuwonis pelamis*) or bigeye scad (*Selar crumenopthalmus*); however, squid is the bait typically used. Some fishermen may also suspend a chum bag containing chopped fish or squid above the highest hook to attract fish.

The typical vessel in the MHI bottomfish fleet is made of fiberglass and measures approximately 23 feet long, although there are a few larger full-time commercial vessels in the fishery (Hospital and Beavers, 2012). Specific bottomfish fishing locations favored by fishermen in the MHI vary seasonally according to sea conditions and the availability and price of target species.

3.3.2 Commercial Fishery Participants

The number of fishermen engaged in commercial bottomfish fishing in the MHI increased dramatically in the 1970s peaking in 1980s with over 500 active vessels annually. However, participation in the fishery then declined in the early 1990s, rebounded somewhat in the late 1990s, but in 2003 reached its lowest level since 1977, with 325 vessels (WPFMC, 2007). The decline in vessels and fishing effort in the early 1990s may have been due to the long-term decrease in catch rates in the bottomfish fishery and a shift of fishing effort towards tuna and other pelagic species.

In the 2007-08 fishing year, NMFS and the Council implemented a suite of measures to reduce fishing mortality on MHI bottomfish, including a total allowable catch (TAC) limit system (WPFMC and NMFS, 2007). Since that time, participation in the commercial fishery sector (measured by the number of fishermen reporting catch of MHI Deep 7 bottomfish) initially increased, but now appears to be decreasing (Table 6). In the 2007-08 fishing year, 351 fishermen actively engaged in the fishery, increasing to 468 fishermen in fishing year 2008-09. Fishing year 2009-10 saw a slight decline to 451 fishermen, but rebounded again to 475 in the 2010-11 fishing year. In next three fishing years, participation in the fishery declined from 468 fishermen in 2011-12, to 457 in 2012-13 and 419 in 2013-14. Over the course of these seven years, fishing effort (measured by the number of fishing trips) generally mirrored participation, initially increasing then declining (Table 6).

Table 6. Summary of participation and catch in the MHI Deep 7 bottomfish commercial fishing sector (2007-15)

Fishing Year	Number of Active Fishermen	Total Trips	Catch Limit (lb)	Total Reported Catch (lb)	Date Fishery Closed	Overage (+)/ Underage (-)
2007-2008	351	2,345	178,000	196,147	Apr. 16, 2008	+18,147 lb (+10.2%)
2008-2009	468	3,275	241,000	259,194	Jul. 6, 2009	+18,194 lb (+7.5%)
2009-2010	451	2,791	254,050	208,412	Apr. 20, 2010	-45,638 lb (-17.9%)
2010-2011	475	3,331	254,050	268,089	Mar. 12, 2011	+14,039 lb (+5.5%)
2011-2012	468	3,075	346,000 (325,000)[1]	228,388	Fishery did not close	-117,612 lb (-34%)
2012-2013	457	2,980	346,000	238,705	Fishery did not close	-108,566 lb (-31%)
2013-2014	419	3,162	346,000	309,485	Fishery did not close	-36,515 (-11%)
2014-2015	405	2,852	346,000	303,738	Fishery did not close	-42,262 (-12.2%)

Source: HDAR unpublished data; http://www.wpcouncil.org/wp-content/uploads/2013/04/MHI_Sum.pdf; http://www.wpcouncil.org/wp-content/uploads/2013/04/MHI201500904_1415_Sum.pdf

[1] Fishery managed using annual catch target (ACT) set at 325,000 lb

3.3.3 Non-Commercial Fishery Participants

There is very limited data on the MHI non-commercial bottomfish fishing sector. In the 2007-08 fishing year, NMFS and the Council implemented a suite of measures to reduce fishing mortality on MHI bottomfish, including mandatory permit and reporting requirement for the non-commercial bottomfish sector to complement Hawaii commercial license reporting requirement (WPFMC and NMFS, 2007). Initially, NMFS issued 80 non-commercial bottomfish permits in 2008 (Table 7). However, since then, the number of permits issued has declined precipitously. Because federal regulations limit non-commercial fishermen to a bag limit of five Deep 7 bottomfish fish per trip, anecdotal information suggests non-commercial bottomfish fishermen have opted to obtain a state CML rather than the federal non-commercial permit. The permits costs a fisherman roughly the same amount ($50 for a state CML vs. $34 for a federal non-commercial bottomfish fishing permit), but the CML has no restrictions on the number of

bottomfish per trip. Cost-earning surveys conducted by Hospital and Beavers (2012) report that over 20% of CML holders do not sell bottomfish, indicating that a substantial number of CML holders are non-commercial. Similarly, State of Hawaii records for the 2013-14 fishing year report that 343 of 419 CML holders who caught bottomfish (82%) sold their catch (HDAR unpublished data). Therefore, it is possible that non-commercial catch of both Deep 7 and non-Deep 7 bottomfish is being reported through the CML system rather than through federal non-commercial logbooks.

Table 7 summarizes the number of federal non-commercial bottomfish permits issued by NMFS between 2008 and 2014, the number of federal permit holders reporting catch of any BMUS, including the number of trips and estimated non-commercial catch of Deep 7 and non-Deep 7 bottomfish. During the most recent three-year period (2011-2013), there was no non-commercial bottomfish fishing activity reported by the federal permit holders.

Table 7. Number of MHI non-commercial fishermen, trips and reported bottomfish catch (2008-14)

Year	No. of Federal Permits Issued	No. of Permits Reporting Catch of BMUS	No. of Trips in the MHI EEZ	Total Reported Logbook Catch (lb)	
				Deep 7 Bottomfish (from Sept 1-Aug. 31 the following year)	*Non-Deep 7 Bottomfish (from Jan. 1 to Dec. 31)*
2008	80	4	9	182	32
2009	59	4	17	309	10
2010	22	confidential	confidential	confidential	confidential
2011	18	0	0	0	0
2012	10	0	0	0	0
2013	3	0	0	0	0
2014	2	0	0	0	0

Source: Kawamoto and Sender (2015)

3.3.4 Ex-Vessel Value and Revenue for the MHI Deep 7 Bottomfish Fishery

In the 2014-15 fishing year, 405 commercial fishermen reported catching 303,738 lb of Deep 7 bottomfish (http://www.wpcouncil.org/wp-content/uploads/2013/04/MHI201500904_1415_Sum.pdf). State of Hawaii records report 341 of the 405 fishermen sold 267,997 lb of Deep 7 bottomfish with a value of $1,815,332 . Thus in the 2014-15 fishing year, commercial fishermen sold approximately 88% of their MHI Deep 7 bottomfish catch.

In the 2013-14 fishing year, 419 commercial fishermen reported catching 309,485 lb of Deep 7 bottomfish. State of Hawaii records report 343 of the 419 fishermen sold MHI Deep 7 bottomfish. These 343 individuals sold a combined total of 269,571 lb at a value of $1,798,713. Thus, in the 2013-14 fishing year, commercial fishermen sold approximately 87% of their MHI Deep 7 bottomfish catch.

NMFS does not have individual catch and revenue data for each CML holder. On average, each of 341 commercial fishermen in 2014-15 sold 786 lb of MHI Deep 7 bottomfish valued at $5,324 per individual fisherman. On average, each of 343 commercial fishermen in 2013-14 sold 786 lb of MHI Deep 7 bottomfish valued at $5,244 per individual fisherman. Based on these revenues, the average price for MHI Deep 7 bottomfish was $6.77/lb in 2014-15 and $6.67/lb in 2013-14. NMFS assumes the remaining commercial fishermen either sold no fish, or Hawaii reporting program did not capture their sales. In reality, there are a fairly small number of "high-liner" commercial fishermen whose sales support a commercial business, and a much larger number of other fishermen whose annual sales are less than $1000. A large percentage of MHI Deep 7 bottomfish fishermen only sell enough bottomfish to cover, or at least offset, the costs of going fishing (Hospital and Beavers, 2012).

3.4 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). Sustainable management of the MHI Deep 7 bottomfish fishery will allow continued harvest of a resource that is important to fishermen, their families, community networks, markets, and visitors for personal consumption (sustenance), and supplemental income.

3.5 Fishery Administration and Enforcement

Fishing for BMUS in federal waters around the MHI is managed by regulations implemented by Hawaii and NMFS. In general, commercial bottomfish fishing in federal waters is managed almost exclusively though measures implemented by the State of Hawaii, which include a CML and reporting requirements and 12 bottomfish restricted fishing areas where all fishing, including non-commercial fishing, is prohibited.

Federal requirements in 50 CFR 665 generally pertain to non-commercial fishing and require non-commercial bottomfish fishermen in Hawaii to obtain a federal permit and report all catch, and adhere to a bag limit of no more than 5 Deep 7 bottomfish per trip. Federal law also prohibits the use of bottom trawls and bottom set gillnets.

Although both Deep 7 and non-Deep 7 bottomfish are typically harvested together during a bottomfish fishing trip, NMFS and the Council manage the Deep 7 bottomfish and non-Deep 7 bottomfish as two separate stock complexes with separate ACLs and AMs. For the MHI Deep 7 bottomfish stock complex, the fishing year begins on September 1 and ends August 31 the following year. For the non-Deep 7 bottomfish stock complex, the fishing year begins January 1 and ends December 31 annually. Federal regulations also require NMFS to specify ACLs and AMs for each stock or stock complex of MUS identified in an FEP, as recommended by the Council, and in consideration of the best available scientific, commercial, and other information about the fishery for that stock or stock complex. NMFS and the Council conduct monitoring of catch against a specified ACL and implementation of AMs.

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 Protected Species

3.6.1 Species Protected under the Endangered Species Act (ESA)

A number of ESA-protected species are documented as occurring in the waters around the Hawaiian Islands. Table 8 lists endangered or threatened species occurring in the waters around Hawaii. They include five whales, the Hawaiian monk seal, five listed sea turtles, and three seabirds.

Table 8. Endangered and threatened marine species and seabirds occurring in the waters of the MHI

Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters of the Hawaiian Archipelago			
Common name	**Scientific Name**	**ESA listing status in Hawaii**	**Occurrence in Hawaii**
Listed Sea Turtles			
Green sea turtle[4]	*Chelonia mydas*	Threatened	Most common turtle in the Hawaiian Islands. Most nesting occurs in the northwestern Hawaiian Islands. Foraging and haulout in the MHI.
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	Small population foraging around Hawaii and low level nesting on Maui and Hawaii Islands.
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	No nesting or foraging grounds in Hawaii. Rarely sighted while traveling between nesting and foraging habitats.
Olive ridley sea turtle	*Lepidochelys olivacea*	Threatened	No nesting or foraging grounds in Hawaii. Infrequently sighted while traveling between nesting and foraging habitats.
North Pacific loggerhead sea turtle distinct population segment	*Caretta caretta*	Endangered	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. Overall population in decline; MHI population increasing
Blue whale	*Balaenoptera musculus*	Endangered	No sightings or strandings reported in Hawaii but acoustically recorded off of Oahu and Midway Atoll.
Fin whale	*B. physalus*	Endangered	Infrequent sightings in Hawaii waters.
Humpback whale	*Megaptera novaeangliae*	Endangered	Migrate through the archipelago and breed during the winter. Est. 6,000-10,000 individuals.

[4] On March 23, 2015, NMFS issued a 12-month finding and proposed rule to remove the current range-wide listing of the green sea turtle, and in its place list 8 distinct population segments (DPS) as threatened and 3 DPSs as endangered. Under the proposed rule, the green sea turtle in Hawaii would be classified as the Central North Pacific DPS and listed as threatened under the ESA (80 FR 15272, March 23, 2015).

Endangered and threatened marine species and seabirds known to occur or reasonably expected to occur in waters of the Hawaiian Archipelago			
Common name	**Scientific Name**	**ESA listing status in Hawaii**	**Occurrence in Hawaii**
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 NWHI and the MHI.
MHI insular false killer whale DPS	*Pseudorca crassidens*	Endangered	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.
Short-tailed Albatross	*Phoebastria albatrus*	Endangered	Nest in small numbers on Midway Atoll in the NWHI.

Source: http://www.nmfs.noaa.gov/pr/species/esa/listed.htm, accessed October 1, 2015.

In 2015, NMFS announced 90-day findings on petitions to list the bigeye thresher, *Alopias superciliosus* (80 FR 48061, August 11, 2015) and the smooth hammerhead shark, *Sphyrna zygaena* (80 FR 48053, August 11, 2015) range-wide, or, in the alternative, any identified distinct population segments (DPSs), as threatened or endangered under the ESA . The petitioners also requested that critical habitat be designated for these species in U.S. waters concurrent with final ESA listings. NMFS found that both petitions presented substantial scientific or commercial information indicating that the petitioned action may be warranted. NMFS is conducting a status review of the species to determine if the petitioned action is warranted.

Applicable ESA Consultations – Hawaii Bottomfish fisheries

To date, there have been no observed or reported interactions between MHI bottomfish fisheries and ESA-listed species. In a biological opinion (BiOp) covering MHI bottomfish fisheries, dated March 18, 2008, NMFS evaluated the impact of the bottomfish fisheries on blue, fin, humpack, 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 that may be 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 vessel transiting state waters en 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). As shown in Tables 6 and 7, the total annual number of commercial and non-commercial bottomfish fishing trips since the 2008 BiOp has been less than 3,500 per year. Therefore, the potential for collisions with bottomfish vessels is substantially lower than estimated in the 2008 BiOp.

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 are not likely to adversely affect MHI insular false killer whales. 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, 2013).

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. 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 a line that marks mean lower low water.

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. In a memo dated March 1, 2016, the consultation concluded with a finding that the bottomfish fishery is not likely to adversely affect the designated Hawaiian monk seal critical habitat, because the effects of the proposed action are expected to be discountable or insignificant.

3.6.2 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 occur or reasonably expected to occur in waters around the Hawaiian Archipelago that have the potential to interact with bottomfish fisheries in the MHI.

The commercial and non-commercial bottomfish fisheries in the MHI are not known to be having adverse effects on non-ESA listed marine mammals listed in Table 9. Although all species occur in EEZ waters where the fisheries operate, the only interactions documented between the fishery and the marine mammals listed in Table 9 are some recorded observations of bottlenose dolphins stealing fish from bottomfish fishing lines near Hawaii and Kaula Island (Nitta and Henderson, 1993). Of the species listed in Table 9, the former bottomfish fishery in the NWHI interacted with only one of the species, the bottlenose dolphin (Tursiops truncatus;

Nitta and Henderson, 1993). Although bottlenose dolphins were observed stealing hooked fish from bottomfish lines, the extent of such interactions are believed to be few. A rate of 2.67 dolphin-damaged fish per 1000 was observed in the NWHI bottomfish fishery by NMFS observers between 1990–1993 (Kobayashi and Kawamoto, 1995). The impact of the bottomfish fishery on the behavior or foraging success of bottlenose dolphins is unknown, but not believed 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

Non-ESA-listed marine mammals known to occur or reasonably expected to occur in waters around the Hawaiian Archipelago		
Common Name	**Scientific Name**	**Interactions with MHI bottomfish fishery**
Blainville's beaked whale	*Mesoplodon densirostris*	No interactions observed or reported.
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.
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.

Source: Council website: http://www.wpcouncil.org

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 1 fishery is one with frequent incidental morality and serious injury of marine mammals. A Category 2 fishery is one with occasional incidental morality and serious injury of marine mammals. A Category 3 fishery is one with a remote likelihood or no known incidental morality and serious injury of marine mammals. On December 29, 2014, (79 FR 77919), NMFS published the final LOF for 2015 which classified the Hawaii bottomfish handline fishery as a Category III fishery under Section 118 of the MMPA. Participants in Category 3 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.

3.6.3 Seabirds of the Hawaiian Archipelago

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 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.

Seabirds forage in both state and federal waters, but are not known, and are unlikely, to interact with the MHI bottomfish fishery. This is because fishermen deploy bottomfish fishing gear close to the vessel. This method of fishing does not afford much opportunity for seabirds to attack the bait. When bottomfish fishing, a weighted mainline is deployed vertically over the side of the

vessel and it sinks 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 are a significant deterrent against seabirds becoming hooked on untended lines. There have been no reports of interactions between the MHI bottomfish fishery and seabirds.

Table 10. Seabirds occurring in the Hawaiian islands

Seabirds of the Hawaiian Archipelago (R= Resident/Breeding; V= Visitor; Vr=rare visitor; Vc= Common visitor)		
	Common name	***Scientific name***
R	Hawaiian petrel	*Pterodroma phaeopygia* (ESA: Endangered)
R	Newell's shearwater	*Puffinus auricularis newelli* (ESA:Threatened)
R	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	Audubon's shearwater	*Pu. lherminieri*
Vc	Short-tailed shearwater	*Pu. tenuirostris*
R	Christmas shearwater	*Pu. nativitatis*
V	Leach's storm-petrel	*Oceanodroma leucorhoa*
V	Matsudaira's storm-petrel	*Oc. matsudairae*
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: WPFMC, 2009

4 Potential Impacts of the Alternatives

This section describes the potential impacts of the proposed ACL and AM specifications on the elements of the affected environment described in Section 3. The environmental impacts analysis evaluates the potential impacts of the proposed ACL specification and AMs in fishing years 2015-16, 2016-17 and 2017-18

4.1 Potential Impacts to Target and Non-Target Species

4.1.1 Alternative 1: No ACL and AM Management (No Action)

Under the No Action alternative, NMFS would not specify an ACL for Deep 7 bottomfish in the MHI and AMs would not be necessary. However, NMFS and the Council would continue to monitor catches based on all available sources of information. Under this alternative, the lack of an ACL or AMs in fishing years 2015-16, 2016-17 and 2017-18 is not likely to result in overfishing of MHI Deep 7 bottomfish in any year. As shown in Table 6, commercial catches of MHI Deep 7 bottomfish have consistently remained below the estimated OFL of 352,000 lb and long-term MSY of 404,000 lb. In the 2013-14 fishing year, the fishery remained open year round and reported a total of 309,485 lb of MHI Deep 7 bottomfish. This is the highest level of catch since NMFS implemented a catch limit system in the 2007-08 fishing year. In fishing year 2015- 16, the fishery remained open year round and the total reported catch (303,738 lb) was sustainable, similar to 2013-14 and 2014-15 catches.

Under this alternative, catches of non-target, non-Deep 7 bottomfish are expected to be at levels similar to catches in recent fishing years and would be sustainable. Bycatch of non-target stocks are expected to continue at low levels and consist primarily of non-Deep 7 bottomfish that are known to be ciguatoxic, and have little or no market value (i.e., kahala, butaguchi and white ulua), and sharks which are released alive. Ongoing fisheries monitoring by the Council's FEP plan team will help fishery scientists and managers to detect any increase in non-target or bycatch and, address them in future management measures, as needed. For these reasons, even without ACL or AM management, the expected impacts to target and non-target stocks would be similar to the impacts described in Alternatives 2 and 3.

Under Alternative 1, the total annual catch of non-Deep 7 bottomfish is expected to continue at or below the levels of recent years (110,106 lb –158,245 lb) and remain below the MSY of 265,000 lb and OFL of 259,200 lb.

4.1.2 Alternative 2: Specify an ACL of 346,000 lb based on the 2011 Stock Assessment with no updated data (Status Quo/NEPA Baseline)

Under Alternative 2, NMFS would specify an ACL of 346,000 lb of MHI Deep 7 bottomfish in fishing year 2015-16, 2016-17, and 2017-18, and a fishery closure as the AM to prevent the fishery from exceeding the ACL. Based on the probability of overfishing projections contained in the 2011 stock assessment (Table 19.1 in Brodziak et al., 2011), an annual catch of 346,000 lb is associated with a 41% probability of overfishing the MHI Deep 7 bottomfish stock complex. This ACL and AM is identical to the ACL and AM that NMFS specified for the fishery in the last three fishing years: 2012-13 (77 FR 56791, September 9, 2012), 2013-14 (78 FR 59626, September 27, 2013), and 2014-15 (80 FR 31863, June 4, 2015).

Under this alternative, NMFS and the Council would continue to monitor catches based on all available sources of information. Based on past fishery performance shown in Table 6, the MHI Deep 7 bottomfish catch in 2015-16, 2016-17 and 2017-18 is expected to be similar to catches in recent fishing years, and remain below the ACL of 346,000 lb. Catch of non-Deep 7 bottomfish is also expected to continue at around 2014 levels (116,135 lb) and remain below the OFL of 259,200 lb. Similarly, bycatch of non-target stocks are expected to continue at low levels and consists of primarily bycatch of non-Deep 7 bottomfish that are known to be ciguatoxic, and have little or no market value (i.e., kahala, butaguchi and white ulua), and sharks which are released alive. Like Alternative 1, Alternative 2 is not likely to result in changes in the conduct of the

fishery, including gear types used, areas fished, level of catch, or have large adverse effects on target or non-target stocks. Therefore, under this alternative, harvest of Deep 7 bottomfish in the MHI would continue to be sustainable and the stock complex is not expected to become subject to overfishing or overfished.

Under Alternative 2, the total annual catch of non-Deep 7 bottomfish is expected to continue at or below the levels of recent years (110,106 lb –158,245 lb) and remain below the MSY of 265,000 lb and OFL of 259,200 lb.

4.1.3 Alternative 3: Specify an ACL of 306,000 lb based on the 2011 Stock Assessment with updated data to 2013 and no phase-in

Under Alternative 3, NMFS would specify an ACL of 306,000 lb of MHI Deep 7 bottomfish in fishing years 2015-16, 2016-17 and 2017-18, and a fishery closure as the AM to prevent the fishery from exceeding the ACL. Based on the probability of overfishing projections contained in the update of 2011 benchmark stock assessment of Deep 7 bottomfish in the Main Hawaiian Islands using data through 2013 (Boggs memo for the record dated March 3, 2015, and the supplemental table dated May 19, 2015), an annual catch of 306,000 lb is associated with a 39% probability of overfishing the MHI Deep 7 bottomfish stock complex.

Under this alternative, NMFS and the Council would continue to monitor catches based on all available sources of information. Based on past fishery performance shown in Table 6, the MHI Deep 7 bottomfish catch in 2015-16, 2016-17 and 2017-18 is expected to be similar to catches in recent fishing years. Since the fishery caught 309,485 lb in the 2013-14 fishing year, the fishery is more likely to reach the ACL of 306,000 lb before the end of the fishing year, thus triggering the in-season closure of the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters and the complementary closure in state waters. However, based on historical fishery performance, the fishery is not likely to reach 306,000 lb until later in the fishing year. For example, in 2013-14 fishing year, the fishery did not reach 306,000 lb until August, the last month of the fishing year (Table 11).

The prohibition on fishing for MHI Deep 7 bottomfish is expected to result in beneficial impacts to the Deep 7 bottomfish stock complex as fishing mortality would effectively cease through the end of the year. Additionally, because non-Deep 7 bottomfish are usually caught on Deep 7 bottomfish trips, annual catch of non-Deep 7 bottomfish stock would be less than under Alternatives 1 (No action) and 2 (Status Quo/Preferred Alternative). Although fishermen may legally continue to catch non-Deep 7 bottomfish during a closure for Deep 7 bottomfish, catches of non-Deep 7 bottomfish in 2015-16, 2016-17 and 2017-18 would not likely to exceed the OFL proxy of 259,200 lb. Therefore, fishermen would be able to fish throughout the fishing year in the same manner as under Alternative 1 and Alternative 2. Alternative 3 would likely result in greater beneficial impacts to the Deep 7 bottomfish stock complex as the lower ACL means the fishery would reach the limit sooner than under the other two action alternatives resulting in a fishery closure. For these reasons, this alternative is not expected to result in large adverse effects on target or non-target stocks.

Under Alternative 3, the total annual catch of non-Deep 7 bottomfish is expected to continue at or below the levels of recent years (110,106 lb –158,245 lb) and remain below the MSY of 265,000

lb and OFL of 259,200 lb.

4.1.4 Alternative 4: Specify an ACL of 326,000 lb, 318,000 lb, and 306,000 lb for fishing years 2015-16, 2016-17, and 2017-18 using a Slow-Up Fast-Down phase-in approach

Under Alternative 4, NMFS would specify an ACL of 326,000 lb, 318,000 lb, and 306,000 lb of MHI Deep 7 bottomfish for the 2015-16, 2016-17, and 2017-18 fishing years, respectively, and a fishery closure as the AM to prevent the fishery from exceeding the ACL. Based on the probability of overfishing projections contained in the update of the 2011 benchmark stock assessment using data through 2013 (Boggs memo for the record dated March 3, 2015, and the supplemental table dated May 19, 2015), an ACL of 326,000 lb, 318,000 lb, and 306,000 lb are associated with 44%, 42%, and 39% probability of overfishing, respectively. Under this alternative, NMFS and the Council would continue to monitor catches based on all available sources of information.

Under Alternative 4, based on the past fishery performance shown in Table 6, the MHI Deep 7 bottomfish catch in 2015-16, 2016-17 and 2017-18 is expected to be similar to catches in recent fishing years, the fishery will not likely reach the ACL of 326,000 lb and 318,000 lb for the first two fishing years. For fishing year 2017-18, the fishery would be more likely to reach the ACL of 306,000 lb before the end of the fishing year, thus triggering the in-season closure of the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters and the complementary closure in state waters. However, based on historical fishery performance, if the fishery were to reach 306,000 lb, this would not occur until later in the fishing year. For example, in 2013-14 fishing year, the fishery did not reach 306,000 lb until August, the last month of the fishing year (Table 11).

Compared to Alternative 3, Alternative 4 has a higher risk level at the first two years but is still much lower than the OFL at 352,000 lb. Alternative 4 is still conservative relative to alternative 1 and 2. The Alternative 2 ACL of 346,000 lb translates to a 48-49% risk of overfishing based on the probability of overfishing projections contained in the update of 2011 benchmark stock assessment using data through 2013 (Boggs memo for the record dated March 3, 2015, and the supplemental table dated May 19, 2015). This would still provide conservation benefit to the stock.

On the third year of Alternative 4, this would likely result in greater beneficial impacts to the Deep 7 bottomfish stock complex as the lower ACL means the fishery may reach the limit sooner than under the other two action alternatives resulting in a greater likelihood of a fishery closure in the third year. This may cause fishermen to shift effort to non-Deep 7 bottomfish, such as uku (*Aprion virscens*) to fill market demand. While it is possible that catch of non-Deep 7 bottomfish could surpass 2013 levels when 158,235 lb was caught, it is unlikely catch of non- Deep 7 bottomfish in 2014-15 and 2015-16 fishing years would reach the OFL of 259,200 lb.
Additionally, NMFS will propose a separate ACL and AM for the non-Deep 7 bottomfish stock complex through a separate action. Therefore, like Alternatives 1, 2 and 3, Alternative 4 is not likely to result in large adverse effects on target or non-target stocks.

Under Alternative 4, the total annual catch of non-Deep 7 bottomfish is expected to continue at or below the levels of recent years (110,106 lb –158,245 lb) and remain below the MSY of 265,000 lb and OFL of 259,200 lb.

4.1.5 Alternative 5: Specify an ACL of 270,000 lb based on the 2011 Stock Assessment with updated data to 2013 and no phase-in

Under Alternative 5, NMFS would specify an ACL of 270,000 lb of MHI Deep 7 bottomfish in fishing years 2015-16, 2016-17 and 2017-18, and a fishery closure as the AM to prevent the fishery from exceeding the ACL. Based on the probability of overfishing projections contained in the update of 2011 benchmark stock assessment using data through 2013 (Boggs memo for the record dated March 3, 2015, and the supplemental table dated May 19, 2015), an ACL of 270,000 lb is associated with a 30% probability of overfishing the MHI Deep 7 bottomfish stock complex. Under this alternative, NMFS and the Council would continue to monitor catches based on all available sources of information.

Under Alternative 5, the fishery would likely reach the ACL of 270,000 lb before the end of the fishing year, thus triggering the in-season closure of the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters and the complementary closure in state waters. Based on recent fishery performance shown in Table 11, the fishery is likely to reach 270,000 lb between April and May of the fishing year, resulting in 3.5 months of fishery closure.

Compared to Alternatives 2 through 4, Alternative 5 would likely result in greater beneficial impacts to the Deep 7 bottomfish stock complex as the lower ACL means the fishery would reach the limit sooner than under the other three action alternatives resulting in a fishery closure. This may cause fishermen to shift effort to non-Deep 7 bottomfish, such as uku to fill market demand. While it is possible that catch of non-Deep 7 bottomfish could surpass 2014 levels when 116,135 lb was caught, it is unlikely catch of non-Deep 7 bottomfish in 2015-16, 2016-17 and 2017-18 fishing years would reach the OFL of 259,200 lb. Additionally, NMFS will propose a separate ACL and AM for the non-Deep 7 bottomfish stock complex through a separate action. Therefore, like Alternatives 1 through 4, Alternative 5 is not likely to result in large adverse effects on target or non-target stocks.

4.2 Potential Impacts to MHI Bottomfish Habitats, including EFH

To prevent and minimize adverse bottomfish fishing impacts to EFH, the Hawaii FEP prohibits the use of explosives, poisons, bottom trawl and other non-selective and destructive fishing gear. Weighted lines or baited hooks may come into contact with bottom substrates during bottomfish fishing operations, and may affect EFH and HAPC. However, research studies to date indicate that bottomfish fishing operations, including gear deployment and a low level of anchor loss are not known to have adverse impacts to EFH (Kelley and Moffitt, 2004; Kelley and Ikehara, 2006).

None of the alternatives, including the preferred alternative (Alternative 4) is expected to change the way in which fisheries are conducted. For this reason, none of the alternatives considered are expected to lead to substantial physical, chemical, or biological alterations to ocean, coral or coastal habitats, or result in loss of, or injury to managed species or their prey or adverse impacts to the marine habitat, including areas designated as EFH, HAPC, or unique areas such as marine protected areas, marine sanctuaries or marine monuments.

4.3 Potential Impacts to Fishery Participants and Fishing Communities

In the 2014-15 fishing year, 405 commercial fishermen reported catching 303,738 lb of Deep 7 bottomfish. State of Hawaii records report 341 of the 405 fishermen sold 267,997 lb of Deep 7 bottomfish with a value of $1,815,332 . Thus in the 2014-15 fishing year, commercial fishermen sold approximately 88% of their MHI Deep 7 bottomfish catch (http://www.wpcouncil.org/wp-content/uploads/2013/04/MHI201500904_1415_Sum.pdf). Based on these revenues, the average price for MHI Deep 7 bottomfish last fishing year was approximately $6.77/lb.

NMFS does not have individual catch and revenue data for individual CML holder. Therefore, on average, each of the 341 commercial fishermen sold 785 lb of MHI Deep 7 bottomfish in the 2014-15 fishing year valued at $5,323 per individual. In reality, there are a fairly small number of "high-liner" commercial fishermen whose sales support a commercial business, and a much larger number of other fishermen whose annual sales of Deep 7 bottomfish are less than $1000. A large percentage of MHI Deep 7 bottomfish fishermen only sell enough bottomfish to cover, or at least offset, the costs of going fishing (Hospital and Beavers, 2012).

4.3.1 Alternative 1: No ACL and AM Management (No Action)

Under the no action alternative, NMFS would not specify an ACL for Deep 7 bottomfish in the MHI, and AMs would not be necessary. Therefore, fishing would be unconstrained in 2015-16, 2016-17 and 2017-18, and could continue throughout the duration of each fishing year. As shown in Table 6, the highest recent catches since NMFS implemented a system of catch limits in the 2007-08 fishing year occurred when fishermen caught 309,485 lb of MHI Deep 7 bottomfish in 2013-14. If there were no ACL, catches could reach or surpass the 2013-14 catch levels. Assuming total catch in 2015-16 will be similar to the 2013-14 record high catch of catch of 309,485 lb, and that fishermen will sell 88% of the catch (i.e., 272,347 lb), the expected fleet-wide revenue during 2015-16 under Alternative 1 would be $1,843,789 using the 2014-15 average price of $6.77/lb. If 341 commercial fishermen sell catch in 2015-16 as done in 2014-15, each fishermen could expect to sell an average of 799 lb of MHI Deep 7 bottomfish valued at
$5,406 per individual. The potential fleet-wide revenue is much higher, since fishermen could catch as many fish as they want, without an ACL to constrain their catch.

The MHI Deep 7 bottomfish fishery provides bottomfish for sustenance, and other gifts, and allows some fish to enter local markets. This provides positive social and economic benefits to fishermen, buyers and fishing communities in Hawaii. Bottomfish fishing activities and consuming bottomfish is not known to result in public health issues. Additionally, because Alternative 1 would not result in changes in the conduct of the fishery, including gear types used, areas fished, level of catch or effort, this alternative would not result in a safety issue for fishermen at sea.

4.3.2 Alternative 2: Specify an ACL of 346,000 lb based on the 2011 Stock Assessment with no updated data (Status Quo/NEPA Baseline)

Under Alternative 2, NMFS would specify an ACL of 346,000 lb of MHI Deep 7 bottomfish in fishing years 2015-16, 2016-17, and 2017-18, and a fishery closure as the AM to prevent the fishery from exceeding the ACL. Assuming the fishery attains the ACL of 346,000 and 88% of the catch is sold (304,480 lb), the potential fleet wide revenue during 2015-16, 2016-17, and 2017-18

is expected to be $2,061,330 using the 2014-2015 average price of $6.77/lb. If the same number of fishermen sell catch in 2015-16, 2016-17, and 2017-18 as in 2014-2015, each of these 341 commercial fishermen could expect to sell an average of 892.9 lb of MHI Deep 7 bottomfish valued at $6,045 per individual.

However, based on past fishery performance shown in Table 6, the MHI Deep 7 bottomfish catch in 2015-16, 2016-17, and 2017-18 is not expected to reach the ACL. Catches would likely be similar to catches in recent fishing years, i.e., well below 346,000 lb. Therefore, under Alternative 2, the impacts to fishery participants and the fishing communities of Hawaii is expect to be the same as the impacts under Alternative 1 (no action).

Expected fleetwide revenue is likely to be the same under Alternative 1 and 2, because of the low likelihood of reaching ACL. But under Alternative 1, with the ability to catch and sell as much fish as they want, fishermen could potentially earn more compared to Alternative 2.

4.3.3 Alternative 3: Specify an ACL of 306,000 lb based on the 2011 Stock Assessment with updated data to 2013 and no phase-in

Under Alternative 3, NMFS would specify an ACL of 306,000 lb of MHI Deep 7 bottomfish in fishing years 2015-16, 2016-17, and 2017-18, and a fishery closure as the AM to prevent the fishery from exceeding the ACL. Assuming the fishery attains the ACL of 306,000 and 88% of the catch is sold (269,280 lb), the potential fleet wide revenue during 2015-16, 2016-17, and 2017-18 is expected to be $1,823,026 using the 2014-15 average price of $6.77/lb. If the same number of fishermen sell catch in 2015-16, 2016-17, and 2017-18 as in 2014-2015, each of these 341 commercial fishermen could expect to sell an average of 790 lb of MHI Deep 7 bottomfish valued at $5,348 per individual.

However, based on past fishery performance shown in Table 6, the MHI Deep 7 bottomfish catch in 2015-16, 2016-17, and 2017-18 would likely be similar to catches in recent fishing years. An ACL of 306,000 lb is lower than the amount of fish caught by the fishery in 2013-14 (309,485 lb), so it is possible that the fishery would be closed before the end of the fishing year. Therefore, under Alternative 3, the possible impacts to fishery participants and the fishing communities of Hawaii is higher than the impacts under Alternative 2 (status quo), and Alternative 1 (no action).

Under Alternative 3, the potential fleet-wide revenue ($1,823,026) is slightly less than the fleet-wide revenue potential under Alternative 2 ($2,061,330). The potential fleet-wide revenue under Alternative 1 is highest of all, since the fishery would not have an ACL.

4.3.4 Alternative 4: Specify an ACL of 326,000 lb, 318,000 lb, and 306,000 lb for fishing years 2015-16, 2016-17, and 2017-18 using a Slow-Up Fast-Down phase-in approach

Under Alternative 4, based on the Council's recommendation, NMFS would specify an ACL of 326,000 lb, 318,000 lb, and 306,000 lb of MHI Deep 7 bottomfish in fishing year 2015-16, 2016-17, and 2017-18, respectively. As an AM to prevent the fishery from exceeding the ACL, the Council recommended NMFS close the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters on the date NMFS projects the fishery would reach the ACL through the end of the fishing year. As an additional AM, if the NMFS and the Council determine the

fishery exceeded the ACL in any fishing year, NMFS would reduce the ACL in the subsequent year by the amount of the overage.

For the 2015-16 fishing year, assuming 88% of 326,000 lb is sold (286,880 lb), the potential fleet-wide revenue is $1,942,178 using the 2014-2015 average price of $6.77/lb. If the same number of fishermen sells their catch in 2015-16 as in 2014-2015, each of these 341 commercial fishermen could expect to sell an average of 841 lb of MHI Deep 7 bottomfish valued at $5,696 per individual.

For the 2016-17 fishing year, assuming 88% of 318,000 lb is sold (279,840 lb), the potential fleet-wide revenue during 2016-17 is $1,894,517 using the 2014-2015 average price of $6.77/lb. If the same number of fishermen sells their catch in 2015-16 as in 2014-2015, each of these 341 commercial fishermen could expect sell an average of 821 lb of MHI Deep 7 bottomfish valued at $5,474 per individual.

The economic impact for fishing year 2017-18 is the same as the economic impact for one year of Alternative 3 (see above).

Potential revenue would be higher for Alternatives 1 and 2 relative to Alternative 4, but potential revenue would be higher for Alternative 4 relative to Alternative 3. Based on recent fishing performance, expected revenue should be about the same for Alternatives 1, 2 and 4. For each of these alternatives, the fishery is expected to remain open all three years, with the possible exception of the 2017-18 fishing year of Alternative 4, when the fishery could reach the ACL of 306,000 lb.

4.3.5 Alternative 5: Specify an ACL of 270,000 lb based on the 2011 Stock Assessment with updated data to 2013 and no phase-in

Under Alternative 5, NMFS would specify an ACL of 270,000 lb of MHI Deep 7 bottomfish in fishing years 2015-16, 2016-17, and 2017-18, and a fishery closure as the AM to prevent the fishery from exceeding the ACL. Assuming the fishery attains the ACL of 270,000 and 88% of the catch is sold (237,600 lb), the potential fleet wide revenue during 2015-16, 2016-17, and 2017-18 is expected to be $1,608,552 using the 2014-15 average price of $6.77/lb. If the same number of fishermen sells catch in 2015-16, 2016-17, and 2017-18 as in 2014-2015, each of these 341 commercial fishermen could expect to sell an average of 697 lb of MHI Deep 7 bottomfish valued at $4717 per individual.

However, based on past fishery performance shown in Table 6, the MHI Deep 7 bottomfish catch in 2015-16, 2016-17, and 2017-18 is likely to reach the ACL if the performance is similar to 2013-14 fishing year. This would close the fishery between April and May of the fishing year resulting in a 3.5 months closure.

The expected and potential fleet-wide revenue under Alternative 5 is the lowest of all of the alternatives. For example, potential annual revenue for Alternative 1 is unlimited, for Alternative 2 is $2,061,330, for Alternative 3 is $1,823,026, for Alternative 4 is $1,942,178 (2015-16), $1,894,517 (2016-17), and $1,823,026 (2017-18), and for Alternative 5 is $1,608,552.

Table 11. Monthly and cumulative catches of MHI Deep 7 bottomfish (2005-15)

Monthly Lb Caught Sept. 2005-Aug 2015										
Month	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Sep	6,841	12,986	29	0	20,718	46,872	40,628	14,043	20,115	38,869
Oct	8,937	31,295	26,059	0	39,943	34,757	23,169	28,200	37,173	29,353
Nov	26,341	28,536	32,003	28,672	8,416	35,424	15,789	20,510	34,012	26,935
Dec	58,210	29,777	23,331	58,764	66,854	67,325	25,859	40,657	55,813	52,967
Jan	15,592	24,195	32,880	49,570	33,273	37,336	44,361	28,064	46,114	55,289
Feb	24,671	18,815	49,362	18,045	26,829	41,675	22,040	5,065	42,643	26,852
Mar	13,709	31,797	28,511	24,449	8,255	4,650	10,429	35,774	20,793	24,633
Apr*	3,817	22,417	3,999.4	28,959	4,754	0	20,144	22,834	8,001	9,815
May*	9,840	5,030	0	35,616	0	0	10,095	12,847	18,575	10,598
Jun*	8,141	0	0	10,840	0	0	4,891	2,651	7,721	11,068
Jul*	7,128	0	2.5	4,283	0	0	5,367	4,929	5,670	7,444
Aug*	9,769	0	0	0	0	0	5,617	12,990	12,815	9,511
Total	**193,003**	**204,852**	**196,178**	**259,201**	**209,043**	**268,041**	**228,389**	**238,565**	**309,485**	**303,738**
Cumulative Lb Caught Sept. 2005-Aug 2015										
Month	**2005-06**	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**
Sep	6,841	12,986	29	0	20,718	46,872	40,628	14,043	20,115	38,869
Oct	15,778	44,281	26,088	0	60,661	81,629	63,797	42,243	57,288	68,222
Nov	42,120	72,818	58,091	28,672	69,077	117,053	79,586	62,753	91,300	95,157
Dec	100,331	102,596	81,422	87,436	135,931	184,378	105,445	103,410	147,113	148,124
Jan	115,924	126,791	114,302	137,007	169,204	221,715	149,806	131,474	193,227	203,413
Feb	140,595	145,606	163,664	155,052	196,033	263,390	171,846	136,539	235,870	230,265
Mar	154,305	177,404	192,176	179,502	204,289	268,041	182,275	172,313	256,663	254,896
Apr*	158,122	199,821	196,176	208,461	209,043	0	202,419	195,147	264,664	264,726
May*	167,962	204,852	196,176	244,077	0	0	212,514	207,994	283,239	275,324
Jun*	176,104	0	196,176	254,917	0	0	217,405	210,645	290,960	286,214
Jul*	183,233	0	196,178	259,201	0	0	222,772	215,574	296,630	293,489
Aug*	193,003	0	0	259,203	0	0	228,389	228,564	309,445	303,738

Source: Hawaii Division of Aquatic Resources, Data available through 9/3/2015
* Denotes months with closed season

Table 12. Monthly mean and maximum lb of MHI Deep 7 bottomfish caught (2005-11)

Hawaii Deep 7 Bottomfish - Monthly Pounds (lb) Caught Sep 2011-May 2015		
Month	*Mean lb Caught **	*Max lb Caught*
Sep	28,414	40,628 (2011-12)
Oct	29,474	37,173 (2013-14)
Nov	24,312	34,012 (2013-14)
Dec	43,824	55,813 (2013-14)
Jan	43,457	55,289 (2014-15)
Feb	24,150	42,643 (2013-14)
Mar	22,907	35,774 (2012-13)
Apr	15,146	22,834 (2012-13)
May	10,626	18,575 (2013-14)
Jun	5,088	7,721 (2013-14)
Jul	5,322	5,670 (2013-14)
Aug	10,474	12,990 (2012-13)

** Months with zero catch not included in the mean*

Table 13. Projected cumulative catch of MHI Deep 7 bottomfish based on reported monthly mean and maximum catches

Month	Based on Monthly Mean*	Based on Monthly Max
Sep	28,414	40,628
Oct	57,888	77,801
Nov	82,199	111,813
Dec	126,023	167,626
Jan	169,480	222,915
Feb	193,630	265,558
Mar	216,537	301,332
Apr	231,683	324,166
May	242,309	342,741
Jun	239,670	350,462
Jul	244,992	356,132
Aug	255,466	369,122

** Months with zero catch not included in the mean*

4.4 Potential Impacts to Fishery Administration and Enforcement

Under all alternatives considered, NMFS and the Council would continue to monitor catches of MHI Deep 7 bottomfish based on all available sources of information, and 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 U.S. EEZ. Therefore, none of the alternatives would result in commitment of additional resources or increased need for fishery enforcement as monitoring of catch is required under all alternatives, including the no action alternative.

4.5 Potential Impacts to Protected Species

To date, there have been no observed or reported interactions between MHI bottomfish fisheries and protected species described in Section 3.6. In a 2008 BiOp prepared for the fishery, 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 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 that there is a potential for them to be killed by vessel transiting state waters en 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 was based on an estimated 71,800 bottomfish fishing trips per year.

As shown in Tables 5 and 6, the total annual number of commercial and non-commercial bottomfish fishing trips since the 2008 has been less than 3,500 per year. Therefore, the potential for collisions with bottomfish vessels is substantially lower than estimated in the 2008 BiOp and is unlikely to occur.

In 2013, NMFS re-initiated consultation under ESA in response to listing of MHI insular false killer whale distinct population segment under the ESA. In its biological opinion dated August 7, 2013, NMFS determined that commercial and non-commercial bottomfish fisheries in the MHI are not likely to adversely affect MHI insular false killer whale because of 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.

None of the alternatives considered in this EA, would modify operations of the Hawaii bottomfish fisheries in any way that would be expected to affect endangered or threatened species or critical habitat in any manner not previously considered in applicable ESA consultations or MMPA determinations. Therefore, none of the alternatives would result in a change to distribution, abundance, reproduction, or survival of ESA-listed species or increase interactions with protected resources.

4.6 Potential Impacts to Biodiversity/Ecosystem Function

When compared against recent fishing harvests, the proposed ACLs of 326,000 lb (2015-16 fishing year) and 318,000 lb (2016-17 fishing year) are higher than recent harvest (Table 6). The proposed ACL of 306,000 lb for the 2017-18 fishing year is lower than the harvest in 2013-14 but higher than the harvest in 2015-16. All proposed ACLs (including those in Alternatives 2-5) are lower than the current MSY (404,000 lb) and OFL (352,000 lb). The ACL and AM specifications were developed using the best available scientific information, in a manner that

accords with the fishery regulations, and after considering catches, participation trends, and estimates of the status of the fishery resources. The ACL and AMs are also not likely to cause large adverse impacts to resources because the conduct of bottomfish fishing would not change as a result of the ACL and AM. Additionally, bottomfish fishing is not known to be a potential vector for spreading alien species as none of vessels fish outside of Hawaiian waters. 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 bottomfish fisheries and none of the alternatives is expected to result in impacts to these environmental features. The proposed ACLs and AMs would not result in changes to the MHI bottomfish fishery and would not have large adverse impacts to marine biodiversity and/or ecosystem function.

4.7 Potential Impacts to Scientific, Historic, Archeological 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 Oahu. However, bottomfish fishing in the MHI is not known to result in adverse impacts to scientific, historic, archeological or cultural resources because fishermen fish for bottomfish on high-relief, deep slopes where such objects would not be found or come to rest. Because the proposed ACL and AM would not result in changes to MHI bottomfish fisheries, none of the alternatives is expected to result in large adverse impacts to resources of scientific, historic, cultural, or ecological importance. Bottomfish fishing in marine protected areas would continue to be restricted by state laws, and fishing in general will continue to be subject to state commercial license and/or federal non-commercial permit and reporting, and joint state/federal monitoring to help to ensure the marine resources of these special areas are sustainable.

4.8 Cumulative Effects of the Proposed Action

Cumulative effects refer to the impact on the environment, which results from the incremental effects of a proposed action when added to other past, present, or reasonably foreseeable future actions within the geographic area of the proposed action. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

4.8.1 Multi-Year ACL and AM for MHI Deep 7 Bottomfish

The specification of an ACL and AMs based on any of the Alternatives presented for MHI Deep 7 bottomfish fisheries in fishing years 2015-16, 2016-17, and 2017-18, is not expected to result in cumulative effects to the health of MHI Deep 7 bottomfish. This is because the proposed action would set the ACL lower than the stock's estimated MSY (404,000 lb) and OFL (352,000 lb). Based on the recent performance of the fishery, annual catches in each of the three years are expected to remain below the proposed ACLs, with the possible exception of the ACL for the 2017-18 fishing year (306,000 lb) in the Preferred Alternative 4. Furthermore, the proposed

action would require NMFS to close the fishery to prevent the ACL from being exceeded. Together, the specification of and ACL and AM over the course of three consecutive years is intended to prevent overfishing from occurring and ensure a sustainable fishery.

4.8.2 ACL and AM Specification for MHI non-Deep 7 Bottomfish

As noted in the Proposed Action section, the Council plans to specify a multi-year ACL and AM for the MHI non-Deep 7 bottomfish stock complex through a separate action. This is because the fishing year for this stock complex is on a calendar year, and not in synch with the fishing year for the Deep 7 bottomfish stock complex, which begins September 1 and ends August 31, annually.

The specification of an ACL and AMs based on the presented Alternatives for MHI Deep 7 bottomfish fisheries in fishing years 2015-16, 2016-17, and 2017-18, is not expected to result in cumulative effects to MHI non-Deep 7 bottomfish. This is because the fishery is not expected to reach the ACL and an in-season fishery closure would not be triggered, thus allowing fishermen to fish for Deep 7 bottomfish throughout the fishing year. The lack of an in-season closure for Deep 7 bottomfish means that fishermen would not need to switch to non-Deep 7 bottomfish stock complex to fill market demand for Deep 7 bottomfish.

In fishing years 2012-13, 2013-14, and 2014-15 the Deep 7 bottomfish fishery remained open throughout the fishing year (Table 6). In the 2013 fishing year for non-Deep 7 bottomfish (which spans the second half of the 2012-13 Deep 7 bottomfish fishing year and the first half of the 2013-14 fishing year), total catch of non-Deep 7 bottomfish was 158,235 lb. This level of catch is well below the MSY of 265,000 lb and the OFL proxy of 259, 200 lb. Under the proposed action, catch of non-Deep 7 bottomfish is expected to continue at around 2013 levels (158,235 lb). Therefore, under this proposed action and NMFS separate action to specify a multi-year ACL and AM for the MHI non-Deep 7 bottomfish fishery, harvest of non-Deep 7 bottomfish in 2015 are expected to continue to be below the stock's MSY and OFL and remain sustainable.

4.8.3 ACL and AM Specifications for other Hawaii FEP Fisheries

In addition to the MHI non-Deep 7 bottomfish specifications, NMFS published a final rule (80 FR 52415, August 31, 2015) specifying ACLs and AMs for all other MHI fisheries; including crustacean fisheries (spiny lobster, slipper lobster, Kona crab and deepwater shrimp), precious coral fisheries (black coral, pink coral, and bamboo coral), and coral reef fisheries from calendar year 2015-2018. 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 Deep 7 bottomfish fishery in any way.

Information on the proposed ACLs and AMs for these fisheries can be obtained from NMFS or the Council by request, or at www.regulations.gov using the regulatory identification number (RIN) 0648-XD558.

The MHI Deep 7 bottomfish fishery does not overlap with these other fisheries to a large extent such that ACLs and AMs in the Deep 7 bottomfish fishery would result in more fishing in these

other fisheries or in the pelagic fisheries. For this reason, the impacts of the proposed MHI Deep 7 bottomfish ACL and AM can be considered separately from the ACL and AM specifications for Hawaii crustacean, precious coral, and coral reef fisheries.

4.8.4 Foreseeable Management Actions Related to Hawaii FEP Fisheries

In the foreseeable future, the Council may re-evaluate the need for conservation and management for all Hawaii FEP MUS and may recommend NMFS remove certain MUS that are not harvested in EEZ waters from the Hawaii FEP and/or re-classify such species as "ecosystem component" (EC) species. To be considered for possible classification as an EC species, the species should be: 1) a non-target species; 2) a stock that is not determined to be subject to overfishing, approaching overfished, or overfished; 3) not likely to become subject to overfishing or overfished; and 4) generally not retained for sale or personal use. Various methods for categorizing species and EC components have been preliminarily discussed at Council meetings. These include, but are not limited to, species caught exclusively or predominately in state/territorial waters, species that occur infrequently in the available time series, species that are non-native to an FEP area, and species associated with ciguatera poisoning and are generally discarded.

In accordance with National Standard 1 guidelines found in 50 CFR §600.310(d), EC species are not considered to be "in the fishery" and thus, do not require specification of an ACL. EC species may, but are not required to remain in the FEP for data collection purposes, for ecosystem considerations related to the specification of optimum yield for associated MUS, for consideration in the development of conservation and management measures for a fishery; and/or to address other ecosystem issues (e.g., management of bycatch). However, until such time a particular MUS is classified as an EC species, it will remain in the fishery and be subject to the ACL and AM requirements.

4.8.5 Other Foreseeable NOAA/NMFS Management Actions

NOAA/NMFS does not have foreseeable management actions that are likely to affect the bottomfish fishery. There are no other foreseeable NMFS management actions pending.

4.8.6 Other Foreseeable NOAA Actions

On March 26, 2015, NOAA's Office of National Marine Sanctuaries (ONMS) published a proposed rule to expand the boundaries of the Humpback Whale National Marine Sanctuary in the MHI (80 FR 16224). The purpose of this action is to transition the sanctuary from a single species management approach to an ecosystem-based management approach. As there are no in-season management measures proposed, the ways in which the MHI bottomfish fisheries are conducted are not expected to change and, therefore, the proposed ACL specification and AMs would not have an environmental effect that would affect future decisions about possible changes to the sanctuary management plan nor would the proposed action affect sanctuary resources.

4.8.7 Climate Change

Changes in the environment from global climate change have the potential to affect MHI bottomfish fisheries. Effects of climate change may include: sea level rise; increased intensity or frequency of coastal storms and storm surges; changes in rainfall (more or less) that can affect salinity nearshore or increase storm runoff and pollutant discharges into the marine environment; increased temperatures resulting in coral bleaching, and hypothermic responses in some marine species (IPCC, 2007). Increased carbon dioxide uptake can increase ocean acidity, which can disrupt calcium uptake processes in corals, crustaceans, mollusk, reef-building algae, and plankton, among other organisms (Houghton et al., 2001; The Royal Society, 2005; Caldeira and Wickett, 2005; Doney, 2006; Kleypas et al., 2006). Climate change can also lead to changes in ocean circulation patterns, which can affect the availability of prey, migration, survival, and dispersal (Buddemeier et al., 2004). Damage to coastal areas due to storm surge or sea level rises as well as changes to catch rates, migratory patterns, or visible changes to habitats are among the most likely changes that would be noted first. Climate change has the potential to adversely affect some organisms, while others could benefit from changes in the environment to ensure that the MHI bottomfish catches are sustainable, regardless of environmental conditions.

The impacts to MHI bottomfish from climate change may be difficult to discern from other impacts; however monitoring of physical conditions and biological resources by a number of agencies will continue to occur and will allow fishery managers to continually make adjustments in fishery management regimes in response to changes in the environment for any alternative.

The efficacy of the proposed ACL and AM specifications in providing for sustainable levels of fishing for bottomfish is not expected to be adversely affected by climate change. Recent catches relative to MSY and OFL estimates helped to inform the development of the ACLs and AMs. Monitoring would continue, and, if monitoring shows overfishing is occurring, ACLs and other fishery management provisions could be adjusted in the future. The proposed specifications are not expected to result in a change to the manner in which any of the affected fisheries are conducted, so no change in greenhouse gas emissions is expected.

For these reasons, climate change, considered in addition to all other factors affecting MHI non-Deep 7 bottomfish stocks (including fishing), is not expected to result in a large and adverse a cumulative impact on MHI non-Deep 7 bottomfish stocks. The proposed action under each alternative is not expected to change the fishery and therefore, none of the action alternatives would result in changes in climate change-promoting gas emissions.

5 Consistency with Other Applicable Laws

This section summarizes the action's conformity with other laws applicable to the federal fishery management process. It presents the preliminary findings of the Council and NMFS regarding compliance with other applicable laws, subject to final determination, after the public comment period.

5.1 National Environmental Policy Act (NEPA)

NOAA Administrative Order (NAO) 216-6, Environmental Review Procedures for Implementing NEPA, requires the consideration of effects of proposed agency actions and alternatives on the human environment and allows for involvement of interested and affected members of the public before a decision is made. The NMFS Regional Administrator will use the analysis in this draft EA to consider a range of alternatives, allow for public involvement in the agency's decision, and to determine whether the proposed action would have a significant environmental impact, which, if so, would require the preparation of an environmental impact statement.

5.2 Preparers and Reviewers

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5.3 Agencies and Persons Consulted

The proposed action described in this EA was developed in coordination with various federal and local government agencies that are represented on the Western Pacific Fishery Management Council. Specifically, representatives of the following agencies that participated in the deliberations and development of the proposed management measures include:

- American Samoa Department of Marine and Wildlife Resources
- Guam Department of Agriculture, Division of Aquatic and Wildlife Resources
- Hawaii Department of Land and Natural Resources, Division of Aquatic Resources
- Hawaii Department of Business, Tourism and Development, Coastal Zone Management Program
- Northern Marina Island Department of Land and Natural Resources, Division of Fish and Wildlife
- U.S. Coast Guard
- U.S. Fish and Wildlife Service
- U.S. Department of State

5.4 Public Coordination

The development of the proposed ACL and AM specifications for Hawaii Deep 7 bottomfish has taken place in public meetings of the SSC and the Council. The Council advertised its intention to focus on the development of recommendations for federal ACL in media releases, newsletter articles, and on the Council's website at http://www.wpcouncil.org. In addition to opportunities for interested members of the public including fishermen to address the Council at public meetings, NMFS made the draft EA available for a 15-day public review and comment period. NMFS received no public comments during the comment period.

5.5 Endangered Species Act

The Endangered Species Act (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. See Section 3.6.1 for a description of ESA-related actions.

Pursuant to Section 7 of the ESA, NMFS has evaluated the MHI bottomfish fisheries managed under the Hawaii FEP for potential impacts on ESA-listed species under the jurisdiction of NMFS (Table 8). Table 14 summarizes ESA Section 7 consultations for Hawaii bottomfish fisheries managed under the Hawaii FEP. In addition to the Biological Opinion of 2008, and modified in 2013, NMFS consulted under the ESA on the potential effects of the MHI bottomfish fishery on monk seal critical habitat. In a memo dated March 1, 2016, the consultation concluded with a finding that the bottomfish fishery is not likely to adversely affect the designated Hawaiian monk seal critical habitat, because the effects of the proposed action are expected to be discountable or insignificant.

Table 14. ESA Section 7 Consultations for Hawaii Botomfish Fisheries

Fishery	Consultation	NMFS Determination
MHI bottomfish fishery	March 18, 2008, Biological Opinion as modified on August 7, 2013.	Likely to adversely affect green sea turtles only; but not likely to jeopardize the continued existence of any ESA-listed species or adversely modify critical habitat
MHI bottomfish fishery	March 1, 2016 Letter of Concurrence on the effects of the bottomfish fishery on monk seal critical habitat designated August 11, 2015	Not likely to adversely affect the designated Hawaiian monk seal critical habitat, because the effects of the proposed action are expected to be discountable or insignificant

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

5.6 Marine Mammal Protection Act

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 1 fishery is one with frequent incidental morality and serious injury of marine mammals. A

Category 2 fishery is one with occasional incidental morality and serious injury of marine mammals. A Category 3 fishery is one with a remote likelihood or no known incidental morality and serious injury of marine mammals.

On December 29, 2014, (79 FR 77919), NMFS published the final LOF for 2015 which classified the Hawaii bottomfish handline fishery as a Category III fishery under Section 118 of the MMPA. Category 3 fisheries are not required to register with the MMAP to engage in

commercial fishing. Because the proposed action would not modify vessel operations or other aspects of any fishery, NMFS does not anticipate that the commercial and non-commercial fishery for MHI non-Deep 7 bottomfish, as conducted under the proposed action, to affect marine mammals in any manner not previously considered, or authorized under the MMPA.

5.7 Coastal Zone Management Act

The Coastal Zone Management (CZM) 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. On July 29, 2015, NMFS sent a letter to the Hawaii CZM Program informing them of its determination that the proposed action is consistent, to the maximum extent practicable, with their respective coastal zone management programs. On July 30, 2015, 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 and, therefore, is not subject to the federal consistency review by the Hawaii CZM Program.

5.8 National Historic Preservation Act

The National Historic Preservation Act (NHPA) requires federal agencies undergo a review process for all federally funded and permitted projects that will impact sites listed on, or eligible for listing on, the National Register of Historic Places. Currently, there are no known sites or historic properties in EEZ waters 3 to 200 nm offshore the MHI that are listed on or eligible for listing on the National Register of Historic Places. Bottomfish 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 bottomfish fishery. For these reasons, the proposed action would not affect historic sites listed on, or eligible for, listing on the National Register of Historic Places.

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 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 Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) (5 U.S.C. 601) 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; and to determine ways to minimize adverse impacts. The assessment is done via the preparation of an Initial Regulatory Flexibility Analyses (IRFA) and Final Regulatory Flexibility Analysis (FRFA) for each proposed and final rule, respectively. Under the RFA, 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.

On June 12, 2014, the Small Business Administration issued an interim final rule revising small business size standards, effective July 14, 2014 (79 FR 33647). The rule increased the size standard for finfish fishing from 19.0 to $20.5 million, for shellfish fishing from $5.0 million to $5.5 million, and for other marine fishing from $7.0 million to $7.5 million.

In general, the relative importance of MHI bottomfish to commercial participants as a percentage of overall fishing or household income is unknown, as the total suite of fishing and other income-generating activities by individual operations across the year has not been examined. Vessels participating in the MHI bottomfish fishery are small entities under the Small Business Administration's definition of a small entity. That is, they are engaged in the business of fish harvesting, are independently owned or operated, are not dominant in their field of operation, and have annual gross receipts not in excess of $20.5 million, the small business size standard for finfish fishing.

Even though this proposed ACL and AM would apply to a substantial number of vessels, i.e., 100% of the bottomfish fleet, NMFS does not expect the rule will have a significant adverse economic impact to individual vessels. This is because the catch limit does not favor any fisherman or disproportionately adversely affect a certain type of participant. Furthermore, catches in the three-previous fishing years when NMFS specified same ACL and AMs indicate that Deep 7 bottomfish landings are not likely to exceed the ACL proposed for 2015-16 and 2016-17. Therefore, there are no likely disproportionate economic impacts between large and small entities. NMFS does not expect the proposed action, if implemented, to have a significant economic impact on small entities.

5.11 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. The APA also establishes a 30-day wait period from the publication date of a final rule until it becomes effective, with rare exceptions. The specification of ACLs for MHI-Deep 7 bottomfish complies with the provisions of the APA through the Council's extensive use of public meetings, requests for comments, and consideration of comments in developing ACL and AM recommendations. Additionally, NMFS will publish a proposed rule announcing the proposed ACL and AM specifications described in this document, which will include requests for public comments.

5.12 Executive Order 12898: Environmental Justice

NMFS considered the effect of the proposed ACL specifications and AMs on Environmental Justice communities that include members of minority and low-income groups. The ACLs would apply to everyone that catches Deep 7 bottomfish in the MHI and no new monitoring is required

for the ACL specification or the AM to be implemented. The environmental review in this EA indicates the proposed action is not expected to result in a change to the way MHI bottomfish fisheries are conducted.

The Council and NMFS intend for the proposed specifications to provide for long-term sustainability of MHI Deep 7 bottomfish, and to benefit the bottomfish resources and, therefore, the human communities that rely on their harvest. The proposed specifications are also not likely to cause a large adverse impact to the environment that could have disproportionately large or adverse effects on members of Environmental Justice communities in Hawaii.

5.13 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.

The specification of an ACL and AM for MHI Deep 7 bottomfish fisheries would be exempt from the procedures of E.O. 12866 because the proposed action contains no implementing regulations.

5.14 Information Quality Act

The Information Quality Act requires federal agencies to ensure and maximize the quality, objectivity, utility, and integrity of information disseminated by federal agencies. To the extent feasible, the information in this document is current. Much of the information was made available to the public during the deliberative phases of developing the proposed specifications during meetings of the Council and its SSC. The information was also improved by the guidance and comments from the Council's advisory groups.

NMFS staff prepared the documents based on information provided by the Council, NMFS PIFSC and NMFS PIRO, and after providing opportunities for members of the public to comment at Council meetings. Additionally, NMFS will make this EA available to the public during the comment period. The process of public review of this document provides an opportunity for comments on the information contained in this document, as well as for the provision of additional information regarding the proposed specifications and potential environmental effects.

6 References

Buddemeier, R.W., J.A. Kleypas, and R.B. Aronson. 2004. Coral Reefs and Global Climate Change: Potential Contributions of Climate Change to Stresses on Coral Reef Ecosystems. Pew Center on Global Climate Change, Arlington, VA. 56 pp.

Brodziak, J.R., A. Yau, J. O'Malley, A. Andrews, R. Humphreys, E. DeMartini, M. Pan, M. Parke, and E. Fletcher. 2014. Stock assessment update of the main Hawaiian Islands deep 7 bottomfish complex through 2013 with projected annual catch limits through 2016. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-43, 61 p.

Brodziak, J., D. Courtney, L. Wagatsuma, J. O'Malley, H.H Lee, W. Walsh, A. Andrews, R. Humphreys, and G. DiNardo. (2011). Stock assessment update of the main Hawaiian Islands Deep 7 bottomfish complex through 2010. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-29, 176 p. + Appendix.

Brodziak, J., R. Moffitt, and G. DiNardo. 2009. Hawaiian bottomfish assessment update for 2008. Pacific Islands Fish. Sci. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Pacific Islands Fish. Sci. Cent. Admin. Rep. H-09- 02, 93 p.

Caldeira, K. and M.E. Wickett. 2005. Ocean model predictions of chemistry changes from carbon dioxide emissions to the atmosphere and ocean. Journal of Geophysical Research, 110 (C09S04).

Doney, S.C., 2006. The dangers of ocean acidification. Scientific American, 294(3): 58-65.

Hare, S.R. and Clark, W.G. 2008. 2007 IPHC harvest policy analysis: past, present, and future considerations. Int. Pac. Halibut Comm. Report of Assessment and Research Activities 2007: 275-295.

Hospital J. and C. Beavers. 2012. Economic and social characteristics of bottomfish fishing in the main Hawaiian Islands. Pacific Islands Fish. Sci. Cent., Natl. Mar. Fish. Serv., NOAA, Honolulu, HI 96822-2396. Pacific Islands Fish. Sci. Cent. Admin. Rep. H-12-01, 44 p. + Appendix.

Houghton, J.T., Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, and D. Xiaosu (Eds.) 2001. IPCC Third Assessment Report: Climate Change 2001: The Scientific Basis. Cambridge University Press, Cambridge, UK, 944 pp. [http://www.grida.no/climate/ipcc_tar/wg1/index.htm] [Also see: Summary for Policymakers and Technical Summary, 98 pp.]

IPCC (Intergovernmental Panel on Climate Change). 2007. Summary for Policymakers. In: Climate Change 2007. The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and

H.L. Miller (Eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Kawamoto, K. and D. Gonzales. 2005. Summary of Reported Main Hawaiian Island Catch Disposition in the Bottomfish Fishery, 2003-2004. Pacific Islands Fisheries Science Center Internal Report IR-05-023. 9 pp.

Kawamoto, K. and K. Sender (2015). Assessment of fishing activities by non-longline federal permit holders in the U.S. Exclusive Economic Zone around the U.S. Pacific Islands. Fisheries Research and Monitoring Division, NOAA Pacific Islands Fisheries Science Center. PIFSC Internal Report IR-15-012. Issued February 13, 2015.

Kelley, C. and R. Moffit. 2004. The impacts of bottomfishing on the Raita and West St. Rogatien Reserve Preservation Areas in the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve. Unpublished report, Hawaii Undersea Research Laboratory, 49 pp.

Kelley, C. and W. Ikehara. 2006. The impacts of bottomfishing on Raita and West St. Rogatien Banks in the Northwestern Hawaiian Islands. Atoll Research Bulletin 543: 305-317.

Kikkawa, B.S. 1980. Preliminary study on the spawning season of the opakapaka, *Pristipomoides filamentosus*. Proceedings of the Symposium on Resource Investigations in the Northwestern Hawaiian Islands. Sea Grant Misc. Report 80-04(2): 226-232.

Kleypas, J.A., R.A. Feely, V.J. Fabry, C. Langdon, C.L. Sabine, and L.L. Robbins. 2006. Impacts of Ocean Acidification on Coral Reefs and Other Marine Calcifiers: a Guide for Future Research. Workshop Report, National Science Foundation, National Oceanic and Atmospheric Administration, and the U.S. Geological Survey.

Kobayashi, D.R. and K.E. Kawamoto. 1995. Evaluation of shark, dolphin, and monk seal interactions with Northwestern Hawaiian Island bottomfishing activity: a comparison of two time periods and an estimate of economic impacts. Fisheries Research 23:11-22.

Martinez-Andrade, F. 2003. A comparison of life histories and ecological aspects among snappers (Pisces: Lutjanidae). PhD Dissertation, Louisiana State University.

Neilson, J.D. 2015. Center for Indendependent Experts (CIE) chair summary report for CIE review of “Stock assessment update for the Main Hawaiian Islands Deep 7 bottomfish complex through 2013 with projected annual catch limits through 2016”. 21 pp.

Nitta, E. and J.R. Henderson. 1993. A review of interactions between Hawaii's fisheries and protected species. Mar. Fish. Rev. 55(2):83-92.

NMFS. 2008. Biological Opinion under Section 7 of the Endangered Species Act on the effects of implementation of new bottomfishing regulations in federal waters of the Main Hawaiian Islands (Amendment 14) on listed marine species. Pacific Islands Region, Protected Resources Division, Honolulu, HI.

NMFS. 2013. Endangered Species Act Section 7 Consultation Biological Opinion [Modification]. Modification to Exisiting Biological Opinion for Main Hawaiian Island MHI) Bottomfish Fisheries following Consultation Reinitiation to Address Listing of the MHI Insular False Killer Whale Distinct Population Segment (DPS) under the Endangered Species Act. Pacific Islands Region, Protected Resources Division, Honolulu, HI.

NMFS. 2013. Environmental Assessment for Annual Catch Limit Specifications and Accountability Measures for Pacific Islands Bottomfish Fisheries in 2013 and 2014, including a Regulatory Impact Review. National Marine Fisheries Service, Pacific Islands Regional Office. January 14, 2013. 132 pp.

Parke, M. 2007. Linking fishermen reported system commercial bottomfish catch data to habitat and proposed restricted fishing areas using GIS and spatial analysis. U.S. Dept. of Commerce. NOAA Tech. Mem., NOAA-TM-NMFS-PIFSC-11. Pacific Islands Fisheries Science Center. Honolulu, HI.

Royal Society. 2005. Ocean acidification due to increasing atmospheric carbon dioxide. The Royal Society, London. 60 pp.

Sabater M. and P. Kleiber. 2014. Improving specification of acceptable biological catches of data-poor reef fish stocks using a biomass-augmented catch-MSY approach. Western Pacific Fishery Management Council. Honolulu, HI.

Stokes, K. 2009. Report on the western Pacific stock assessment review 1 (WPSAR 1) Hawaii deep slope bottomfish. Center for Independent Experts, stokes.net.nz Ltd., Wellington 6035, New Zealand. 27 pp.

Williams, I. 2010. U.S. Pacific reef fish biomass estimates based on visual survey data. NOAA, National Marine Fishery Service, Pacific Island Fishery Science Center (PIFSC). PIFSC Internal Report: IR-10-024. 18 pp.

WPFMC (Western Pacific Fishery Management Council). 2009. Fishery Ecosystem Plan for the Hawaiian Archipelago. Honolulu, HI. September 24, 2009.

WPFMC and NMFS. 2007. Amendment 14 to the Fishery Management Plan for Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region, including a final supplemental environmental impact statement, regulatory impact review and an initial regulatory flexibility analysis. Western Pacific Fishery Management Council. Honolulu, HI.

WPFMC and NMFS. 2011. Omnibus amendment for the western Pacific region to establish a process for specifying annual catch limits and accountability measures, including an environmental assessment. Amendment 1 to the PRIA FEP, Amendment 2 to the American Samoa Archipelago FEP, Amendment 2 to the Mariana FEP, Amendment 3 to the Hawaii Archipelago FEP. Western Pacific Fishery Management Council and NMFS, Honolulu, HI.

Appendix A

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Fisheries Science Center
1845 Wasp Blvd. Bldg. 176 • Honolulu, Hawaii 96818-5007
(808) 725-5300 • Fax: (808) 725-5532

March 03, 2015

MEMORANDUM FOR: The Record

FROM: Christofer H. Boggs

ABOUT: Advice regarding what Deep-7 bottomfish assessment to use in 2015

Our assessment scientists did a good job on the 2014 assessment, which initiated an improvement in the approach for standardizing CPUE data. The Science Center now has additional insights to why the fisheries data used in the 2014 assessments produced results that CIE peer review advised were not ready for management application. These insights result from the intense scrutiny the assessment has received and our consideration of the peer review's conclusions. Although the 2014 assessment used a superior new approach to standardizing CPUE compared to the 2011 assessment, there are some good reasons why the fisheries data could be better used in such an approach. The 2011 assessment relied on the only data continuously available throughout the time series: catch per day fished. The new 2014 CPUE standardization approach split the time series into old (1949-1993) and new stanzas (1994-2013). It did so to account for differences among fishermen that could only be linked through time in the recent stanza. The fisheries data could be better used for this new split-stanza context in two important ways:

1) Although catch per day fished is the best available CPUE that is available continuously over the whole time series, it may not be the best available over the most recent time series. If the time series is to be split with CPUE issues addressed differently before and after the split, one could also analyze and include detailed effort data that has been collected only for the last dozen years. This data could strongly influence recent trends. This was not seen by the Center as the work for a simple update in 2014, as it is a complex undertaking.

   The use of CPUE defined as catch per day fished is subject to great criticism, and one way to address this is use of details on hours and numbers of lines and hooks used by fishermen over the last dozen years. Only inexplicit, undescribed differences among fishermen linked through time were applied to the recent stanza in the 2014 CPUE standardization. Using the recent effort detail would still allow differences between individual fishermen to be

standardized, and also allow changes in effort details through time, to be addressed. Both were factors of great concern to the reviewers. (Differences among areas and seasons and other such factors that can be applied throughout the whole time series have remained part of the CPUE standardization in both 2011 and 2014).

2) Further efforts could be made to apply the CPUE standardization for differences between fishermen to more data using various exploratory methods and other data sets. The 2014 assessment overlooked a compilation of confidential non-electronic records held by the State of Hawaii that may help to link fisher's identities back through an earlier stanza of time.

Since the CIE peer review advised that the 2014 assessment was not ready for application to management, and we cannot improve the assessment in the ways described above in short order, the Science Center believes that a much more simple update of the 2011 assessment using data from the 3 most recent years available provides the best scientific information available for management. Although catch per day fished may not be the best available CPUE data that can be used in the superior split-stanza CPUE standardization, it is the best available CPUE data that is available over the entire time series, and thus appropriate for use in the 2011 assessment approach, which does not utilize a split-stanza CPUE standardization approach.

Attachment:

Update of 2011 benchmark stock assessment of Deep 7 bottomfish in the Main Hawaiian Islands using data through 2013

Update of 2011 benchmark stock assessment of Deep 7 bottomfish in the Main Hawaiian Islands using data through 2013

This document summarizes the results of a strict update of the 2011 benchmark assessment of Deep 7 bottomfish in the Main Hawaiian Islands (Brodziak et al. 2011) using three additional years of data from 2011-2013. Both catch data and standardized CPUE from 2011-2013 are included; CPUE is standardized using the same methods as previously applied in the 2011 assessment. All other assumptions and methods are the same as those used in the 2011 stock assessment.

Table 1. Estimated parameters, reference points, and stock status values. Values indicating biomass (e.g. B, B_{MSY}, MSY) are in units of million pounds.

Parameter/Reference point/ Stock status	Mean	SD
r	0.106	0.025
K	27.36	9.378
M	1.76	1.28
P_1	0.58	0.1
Q	13	4.3
τ^2	0.05	0.01
σ^2	0.022	0.008
H_{MSY}	6.00%	2.10%
B_{MSY}	14.51	4.267
MSY for Total Catch	0.839	0.324
MSY for Reported Catch	0.404	0.156
P_{MSY}	0.54	0.08
H_{2013}	3.80%	1.40%
H_{2013}/H_{MSY}	0.627	N/A
Prob ($H_{2013} > H_{MSY}$)	14.7%	N/A
B_{2013}	13.34	5.397
B_{2013}/B_{MSY}	0.930	0.258
Prob ($B_{2013} < 0.70*B_{MSY}$)	25.1%	N/A

Table 2. Estimated acceptable biological catches (ABCs) (pounds) for commercial fishing in fishing years 2015 and 2016, corresponding 2015 probabilities of overfishing from 0% to 50% in 5% increments, as well as mean projected harvest rates, exploitable biomasses, and probable stock status conditions. Overfished is defined as $B<0.70*B_{MSY}$, and overfishing is defined as $H>H_{MSY}$. These projections assume that annual commercial catch in 2014 was 276,000 pounds, or 80% of the 2014 annual catch limit of 346,000 pounds.

Probability of Overfishing Deep7 Bottomfish in the Main Hawaiian Islands in Fishing Year 2015	Acceptable Biological Commercial Catch (pounds) in Fishing Years 2015 and 2016	Probability of Overfishing in 2016	Expected Harvest Rate in 2015	Expected Harvest Rate in 2016	Mean Exploitable Biomass (1000,000 pounds) in 2016	Probability of being overfished in 2016
0.00	14,000	0.00	0.2%	0.2%	14.80	0.15
0.05	130,000	0.05	2.3%	2.2%	14.56	0.17
0.10	174,000	0.10	3.1%	3.0%	14.47	0.18
0.15	202,000	0.14	3.6%	3.5%	14.41	0.18
0.20	228,000	0.19	4.0%	4.0%	14.35	0.18
0.25	250,000	0.24	4.4%	4.4%	14.31	0.19
0.30	270,000	0.29	4.8%	4.7%	14.27	0.19
0.35	290,000	0.34	5.1%	5.1%	14.23	0.19
0.40	310,000	0.39	5.5%	5.5%	14.18	0.20
0.41	314,000	0.40	5.6%	5.6%	14.18	0.20
0.45	330,000	0.44	5.8%	5.9%	14.14	0.20
0.50	352,000	0.50	6.2%	6.3%	14.10	0.21

References:

Brodziak, J., D. Courtney, L. Wagatsuma, J. O'Malley, H. Lee, W. Walsh, A. Andrews, R. Humphreys, and G. DiNardo. 2011. Stock assessment of the Main Hawaiian Islands Deep7 bottomfish complex through 2010. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TMNMFS-PIFSC-29, 176 p. + Appendix.

Risk table from projections of an update of the 2011 benchmark stock assessment of Deep 7 bottomfish in the Main Hawaiian Islands using data through 2013

May 26, 2015

This document provides additional detail of the projections from a strict update of the 2011 benchmark assessment of Deep 7 bottomfish in the Main Hawaiian Islands (Brodziak et al., 2011) using three additional years of data from 2011-2013. Both catch data and standardized CPUE from 2011-2013 are included as additional data; CPUE is standardized using the same methods as previously applied in the 2011 assessment. All other assumptions and methods are the same as those used in the 2011 stock assessment.

Table 3. Estimated acceptable biological catches (ABCs) in lb for commercial fishing in fishing years 2015 and 2016, and corresponding 2015 and 2016 probabilities of overfishing. Overfishing is defined as H>HMSY. These projections assume that annual commercial catch in 2014 was 276,000 lb, or 80% of the 2014 annual catch limit of 346,000 lb.

Probability of Overfishing Deep7 Bottomfish in the Main Hawaiian Islands in Fishing Year 2015	Acceptable Biological Commercial Catch (lb) in Fishing Years 2015 and 2016	Probability of Overfishing Deep7 Bottomfish in the Main Hawaiian Islands in Fishing Year 2016
0 01	36 000	0 01
0.05	130,000	0.05
0.10	174,000	0.10
0.15	202,000	0.14
0.20	228,000	0.19
0.25	250,000	0.24
0.26	254,000	0.25
0.27	258,000	0.26
0.28	262,000	0.27
0.29	266,000	0.28
0.30	270,000	0.29
0.31	274,000	0.30
0.32	278,000	0.31
0.33	282,000	0.32
0.34	286,000	0.33
0.35	290,000	0.34

0.36	294,000	0.35
0.37	298,000	0.36
0.38	302,000	0.37
0.39	306,000	0.38
0.40	310,000	0.39
0.41	314,000	0.40
0.42	318,000	0.41
0.43	322,000	0.42
0.44	326,000	0.43
0.45	330,000	0.44
0.46	334,000	0.45
0.47	340,000	0.47
0.48	344,000	0.48
0.49	348,000	0.49
0.50	352,000	0.50

Appendix B

Table 19.1.--Projection results showing the total allowable commercial catches (1000 pounds) of Deep 7 bottomfish in fishing years 2012 and 2013 that would produce probabilities of overfishing in 2012 of 0%, 5%, 10%, …, 50% and greater under the most plausible catch and CPUE scenarios: Catch Scenario II and CPUE Scenario I.

Catch Scenario II and CPUE Scenario I				
Probability of Overfishing Deep 7 Bottomfish in the Main Hawaiian Islands in Fishing Year 2012	Total Allowable Commercial Catch (1000 pounds) of Deep 7 Bottomfish in Fishing Years 2012 and 2013	Probability of Overfishing Deep 7 Bottomfish in the Main Hawaiian Islands in Fishing Year 2013	Median Ratio of Deep 7 Bottomfish Exploitable Biomass in 2013 to BMSY	Probability That Deep 7 Bottomfish Biomass in 2013 Is Greater Than the Minimum Stock Size Threshold (0.7*BMSY)
0	11	0	1.05	0.92
0.05	147	0.02	1.03	0.91
0.10	197	0.09	1.02	0.90
0.15	229	0.14	1.02	0.90
0.20	255	0.19	1.01	0.89
0.25	277	0.24	1.01	0.89
0.30	299	0.29	1.01	0.89
0.35	319	0.34	1.00	0.88
0.40	341	0.39	1.00	0.88
0.45	361	0.45	1.00	0.88
0.50	383	0.50	0.99	0.88
0.55	407	0.56	0.99	0.87
0.60	429	0.60	0.99	0.87
0.65	455	0.66	0.98	0.87
0.70	481	0.71	0.98	0.86
0.75	513	0.76	0.97	0.86
0.80	549	0.81	0.97	0.85
0.85	597	0.86	0.96	0.84
0.90	665	0.91	0.95	0.83
0.95	783	0.96	0.93	0.81
0.99	1001	0.99	0.90	0.77

Appendix C

WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

P* Working Group Meeting

May 6, 2015
10:00 am to 4:00 pm
Main Conference Room
Council Office

Working group participants: Bob Skillman (SSC member), David Itano (SSC member), Annie Yau (NMFS PIFSC-Presenter), Christofer Boggs (NMFS PIFSC), Gary Beals (HI AP Chair), Layne Nakagawa (Fisherman, AP member), Roy Morioka (Fisherman, H-FACT), Ariel Jacobs (NMFS PIRO)
Council staff: Marlowe Sabater and Mark Mitsuyasu (WPRFMC)
Public: Ed Ebisui III (Fisherman-Oahu), Ed Watamura (Fisherman, AP member)
Invited but absent: Ed Ebisui (Council member), Matt Dunlap (NMFS PIRO)

DRAFT REPORT

1. **Introductions**

   The meeting started at 10:05 am. Council staff provided an overview of the meeting and the agenda. Clarifications were made on the membership of the working group. Chris Boggs replaced Bob Humphreys (in a Life History Workshop), Annie Yau is a presenter and resource person, David Itano was invited to be a working group member since he was part of the original P* working group. Ed Ebisui III and Ed Watamura are members of the public that provided additional insights regarding the fishery. Fishermen were included as working group members to incorporate their expertise and knowledge on the various uncertainties related to the fishery and how that affects the data that goes into the assessment. This also enhances the transparency of the P* process.

2. **Recommendations from previous Council meetings**

   Council staff presented on the recommendations from the 162nd Council Meeting. The first recommendation was the delivery of the updated results of the 2011 assessment adding 3 yr of data in order to facilitate the P* process. Recent developments from generation of the 2014 draft stock assessment and the succeeding reviews highlighted the uncertainties related to the scientific information which affects the P* hence the need to revisit the P* analysis for this fishery. This working group meeting addresses that Council recommendation.

   The second recommendation was to organize a Data Workshop for the MHI deep 7 bottomfish fishery that would support the development of the benchmark assessment due on 2017. This will be a series of workshops to finalize the datasets that would go into the benchmark assessment. Fishermen will be invited to participate in these workshops in order to ground-truth the data and put it to proper perspective.

3. Overview of the P* process

Council staff provided an overview of the P* process. The P* analysis is a semi-quantitative process to determine the risk of overfishing associated with the scientific uncertainty in the data and the assessment. This determines the buffer between the overfishing limit (OFL) and the acceptable biological catch (ABC). The four dimensions were described (assessment information, uncertainty characterization, stock status, productivity and susceptibility) and the criteria associated with each. The previous P* scoring process was reviewed

The deep 7 complex is assessed as a complex but can also use an indicator species within the complex. Changing the management unit species complex would require an amendment. Management is done on the complex and the overfishing determination is linked to the complex. There were concerns about exploitation of the vulnerable species when managing on a complex. However, the D7 assessment takes into consideration of the life history of the most dominant species in the catch and the vulnerable species just make up a small percent of the fishery landing. There was some discussion on whether to break apart the complex first and do the assessment to determine real status of the vulnerable species or conduct the assessment of the vulnerable species first prior to breaking the complex and manage species individually. Nonetheless, once it was determined that a species is being overfished and experiencing overfishing, the Council would need to take action.

4. State of the Science for the Main Hawaiian Island Deep 7 Bottomfish Report on assessment update using 2011 model with 3 years of data

Dr. Annie Yau presented on the background of the 2011 stock assessment and the results of the assessment update with 3 additional yr of data (catch and CPUE from 2011-2013). Dr. Yau enumerated various sources of uncertainties built into the assessment: unreported catch (± 20%), standard deviation in the standardized CPUE, observation error (assumes there are errors in the data), and process error (uncertainties due to weather, climatic, productivity change over time). The latter sets of errors are estimated via the input data (model has flexibility is fitting – inability to measure things, allows the model to accept noise and fluctuate) and assumed to have an average value over time.

The discussion focused on the following points:

- The model works because it was able to detect the effects of the fishery in the CPUE and the CPUE is linked to the abundance of the fish.

- Fishing skill is important to take into consideration but is currently challenging to model. Change in gear efficiency can be masked by fishing skill and change in fishery participants over time.

- CPUE may have been affected during the TAC year because people are racing to the fish. However, during the period that the fishery is closed is associated with the low CPUE. That should have been accounted for in the quarter.

Summary of comments from the CIE reviewers affecting uncertainties

Dr. Annie Yau summarized the various sources of uncertainties brought up by the various reviewers of the 2011 and 2014 stock assessments. First was related to life history. The reviewers felt that the M used in both assessments is too high (0.30 and 0.25 for 2011 and 2014, respectively). The reviewers recommended that M=0.10 to 0.15 would be more appropriate.

DAR trip reports – data quality of catch and effort was suspect prior to 1994 – improved data collection especially tracking individual CML; the forms changed over time; the requirements for reporting also changed

Unreported catch – pre 1990 estimates of unreported catch should be explored since the study used focused on Oahu. More analysis needs to be done on unreported catch. Directional biases over time, the 20% uncertainty may not be capturing this. The unreported catch uncertainty in earlier year may not be consistent over time. More thought on the +- 20%.

Bayesian priors may be too informative – might influence the results; changes in technology and fishing efficiency should be accounted for.

Production model is not capturing the size and age structure. The model may not capture individual species dynamics, since species are combined into a complex; Magnitude the process error is assumed constant over time but this might not be true

The discussion brought up the following points:

- Fishermen brought up the suggestion to use size based estimates into the assessment. This is one alternative data set that can be explored in the data workshop. However, a size structured model may require additional parameters in order to work and still have to be tested if the size data will not conflict with other data sets and have the model converge.

- It was also brought up that total weight is heavily biased to opakapaka. Paka are dense fish while others including the onaga are lighter in weight for a given length. So when plotting weight over time, the weight composition of the complex may change. Number of fish may be one more data to consider. Length data is also harder to collect due to size selectivity of the fishery. Different fishermen have different size composition of their catch. Hi-liners tend to target the bigger fish due to the commercial nature of their operation while part-timers and those new to the fishery would take all sizes of fish. One idea brought up was to standardize the CPUE for species.

- The number of fishermen reporting catching bottomfish seemed to be overinflated and the catches are skewed towards a few highliners.

- In the big island palu ahi fishery, the bottomfish is considered bycatch. This may require the filtering of bycatch from the data. The trip is for tuna but a lot of bottomfish is caught and becomes part of the record because the report does not filter bycatch. [Need to verify by reviewing Kona palu ahi reports.]

Review of the P* Dimensions and Criteria Assessment information

i. Reliable catch history – The previous score was 0. There is now recognition that the data is not perfect hence cannot score it 0. In contract, cannot throw away the catch history otherwise it cannot be used thus cannot score it a 1. The uncertainty measure was incorporated but is this uncertainty able to compensate with the deficiency. The reliability of the earlier year is questionable. It's the data that the assessment scientist can work with. The uncertainty focuses or more concern is the unreported catch. The catch data is catching some signal on the history of the fishery. The unreported catch is questionable due to the point estimates given vary in their estimates. The most recent estimates may be more reliable. A score of 0.2 is appropriate.
ii. Standardized CPUE – The previous score was 0. It is not a perfect CPUE standardization. Although, the reviewers agreed that adding the gear efficiency and fisherman skill as a significant improvement, the standardization did not account for other sources of available data. The patterns seen in the CPUE makes analytical sense and the signal of changes in the fishery is captured in the standardization. Other factors will be controlled in the next benchmark. The group felt the assessment is halfway in terms of acceptable CPUE standardization hence a score of 0.5 was applied.
iii. Species specific data – the model is saying that everything is opakapaka; not species specific in any way. A score of 1 still applies.
iv. All sources of mortality accounted for – The biggest source of mortality that is unknown is the unreported catch. Other sources of mortality are discards and bycatch that are known to occur in the fishery but are deemed insignificant compared to the unreported catch. There were also uncertainties associated with the true estimate of natural mortality. A score of 0.5 still applies.
v. Fishery independent survey – Although fishery independent surveys has been conducted in the Maui nui area, these has not gone operational and not incorporated in the assessment. A score of 1 still applies
vi. Tagging data – There is an existing tagging program for bottomfish that yields some results. This data has not been analyzed and applied in the assessment. The score of 1 still applies.
vii. Spatial analysis – Although reporting areas have been used as a standardization factor in the assessment, the assessment is still considered as a basic surplus production model with no specific spatial analysis. It

was noted that spatial analysis might not be feasible at this stage because the available data is not sufficient for a spatially explicit stock assessment. It is more appropriate to use size/length frequency as an assessment aspect because that is the next level of assessment that can be made available. The score of 1 still applies.

Assessment Aspects (AAs)	Score
Reliable catch history	0.2
Standardized CPUE	0.5
Species-specific data	1
All sources of mortality accounted for	0.5
Fishery independent survey	1
Tagging data	1
Spatial analysis	1
SUM	5.2 scaled equivalent = -1.6

Uncertainty characterization

The initial score for this dimension was 0. CIE highlighted several uncertainties - +-20% might not be an accurate error; proscriptive prior; issue of uncertainty about power and skill. However, the assessment did incorporate several uncertainties as described in the above section. The group elevated the reduction score from 0 to 2.0.

Description	Score
Complete. Key determinant – uncertainty in both assessment inputs and environmental conditions included	-0.0
High. Key determinant – reflects more than just uncertainty in future recruitment	-2.5
Medium. Uncertainties are addressed via statistical techniques and sensitivities, but full uncertainty is not carried forward in projections	-5.0
Low. Distributions of F_{MSY} and MSY are lacking	-7.5
None. Only single point estimates; no sensitivities or uncertainty evaluations	-10

Stock status

The initial score for this dimension is 3. This was elevated from 2 to 3 due to the multi-species nature of this fishery. Some species may be hit harder than others and it goes undetected. This rationale is duplicative of the first dimension (species specific data). The P* working group revised the rationale behind the score. Given the CIE review comment on the natural mortality being overestimated, changing

the M from 0.3 or 0.25 to 0.1 will move the MSST closer to the current point estimate of biomass. This necessitates the score to be elevated from 2 to 4. There was much discussion among the working group members on these criteria but given the inability to revise the characteristics of the four key determinants for this P* analysis, a score of 4.0 was selected. Members felt that another descriptor with a Score of -3.0 would have been more appropriate

Description	Biomass (B) and Fishing (F) Levels	Score
Neither overfished nor overfishing	B > MSST and BMSY, F < MFMT	-0.0
Neither overfished nor overfishing	B > MSST, F < MFMT	-2.0
Neither Overfished nor overfishing	B ≥ MSST, F ≤ MFMT	-4.0
Stock is not overfished, overfishing is occurring	B > MSST, F > MFMT	-6.0
Stock is overfished, overfishing is not occurring	B < MSST, F ≤ MFMT	-8.0
Stock is overfished, overfishing is occurring	B < MSST, F >MFMT	-10.0

Productivity and susceptibility

The initial score is 4.9. The life history team was not present in the meeting. Working group members recommended to hold-off on changing the scores on this dimension until they are available for no-one had any expertise on this dimension. Chris Boggs will consult with Bob Humphreys and Bob Moffitt on the scores and rationale behind the scores. In an email from Boggs dated May 7, 2015 1:51 pm, he confirmed that the susceptibility parameter is related to the vulnerability to capture in the fishery and not related to life history. The fishermen can provide the appropriate scores for this parameter.

It is suggested that the working group survey those MHI BF fishermen who have been engaged in the SA process to evaluate this determinant and provide their consensus score.

Description	Score	
Low risk. High productivity, susceptibility low.	-0.0	
Low/medium risk. Moderate productivity, low susceptibility	-2.5	-4.9
Medium risk. Moderate productivity, and susceptibility	-5.0	
Medium/High risk. Moderate productivity, high susceptibility	-7.5	
High risk. Low productivity, high susceptibility	-10	

5. **Summary of scores and P* recommendations**

Dimension	Score
1. Assessment Information: Quantitative assessment provides estimates of exploitation and B; includes MSY-derived benchmarks, but species specific data, fishery independent data, tagging data, spatial analysis and all sources of mortality not captured in the assessments	-1.6
2. Uncertainty characterization: Complete. Key determinant – uncertainty in both assessment inputs and environmental conditions included	-2
3. Stock status: Neither overfished nor overfishing, but status based on stock complex as opposed to individual stocks.	-4
4. PSA: Medium risk: Moderate productivity, and susceptibility	-4.9
Final Score	-12.5
P* = total score (-9.2) from ABC_{Max} of 50	**P* = 37.5 ≈ 38**

The preliminary P* score is 38%. This may change once the PSA dimension has been revisited. Another meeting will be scheduled to finalize the scores. This will be scheduled on the latter part of May and working group members will be invited to finalize the scores.

The meeting ended at 5:05 pm

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FINDING OF NO SIGNIFICANT IMPACT

Specification of Annual Catch Limits and Accountability Measures for Main Hawaiian Islands Deep 7 Bottomfish Fisheries for Fishing Years 2015–16, 2016–17, and 2017–2018

(RIN 0648-XE062)

March 17, 2016

The National Marine Fisheries Service (NMFS) prepared this Finding of No Significant Impact (FONSI) according to the guidelines for a FONSI for fisheries management actions in NMFS Instruction 30-124-1 (July 22, 2005), and the requirements in National Oceanic and Atmospheric Administration (NOAA) Administrative Order 216-6 (NAO-216-6, May 20, 1999), concerning compliance with the National Environmental Policy Act (NEPA). The environmental effects analysis in the attached environmental assessment (EA), dated March 17, 2016, supports this FONSI.

Background

NMFS and the Western Pacific Fishery Management Council (Council) manage fishing for bottomfish management unit species (BMUS) in federal waters of the Exclusive Economic Zone (EEZ; generally 3–200 nautical miles from shore) around Hawaii through the Fishery Ecosystem Plan for the Hawaiian Archipelago (Hawaii FEP), as authorized by the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act). Bottomfish fishing now occurs only in waters around the main Hawaiian Islands (MHI); there is no commercial fishing in the Northwestern Hawaiian Islands management area (see EA, section 1).

The MHI bottomfish fishery harvests an assemblage of 14 different BMUS. NMFS and the Council manage Hawaii BMUS as two separate stock complexes: the Deep 7 and non-Deep 7 bottomfish stock complexes.[1] Deep 7 bottomfish include onaga (*Etelis coruscans*), ehu (*E. carbunculus*), gindai (*Pristipomoides zonatus*), kalekale (*P. sieboldii*), opakapaka (*P. filamentosus*), lehi (*Aphareus rutilans*), and hapuupuu (*Hypothordus quernus*). Deep 7 bottomfish are generally found along high-relief slopes, at depths ranging from 80–400 m. Several non-Deep 7 bottomfish are caught during fishing for Deep 7 bottomfish, including uku *(Aprion virescens)*, white ulua *(Caranx ignoblis)*, black ulua *(C. lugubris)*, taape *(Lutjanus kasmira)*, yellowtail kalekale *(Pristipomoides auricilla)*, butaguchi (*Pseudocaranx dentex)* and kahala (*Seriola dumerili)*. Fishermen usually catch the non-Deep 7 bottomfish at shallower depths.

[1] The Magnuson-Stevens Act defines "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 600.310(c) define a "stock complex" as 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.

The Magnuson-Stevens Act and federal regulations implementing the Hawaii FEP require NMFS to specify annual catch limits (ACL) and accountability measures (AM) to help prevent the fishery from exceeding the ACL for each stock or stock complex of MUS identified in an FEP (50 CFR 665.4). The Council recommends the ACL and AM, considering the best available scientific, commercial, and other information about the fishery.

Federal Action

NMFS proposes to specify an ACL of 326,000 lb of Deep 7 bottomfish in the EEZ around the MHI for fishing year 2015–16. The fishing year for Deep 7 bottomfish begins September 1 and ends on August 31 the following year. This action implements Alternative 4 of the EA. NMFS will implement the specifications for fishing years 2016–17 and 2017–18 separately. As an AM to prevent the fishery from exceeding the ACL, if NMFS projects that the fishery will reach the ACL, the agency will close the commercial and non-commercial fisheries for MHI Deep 7 bottomfish in federal waters through the end of the fishing year. Although not part of the action, during a federal fishery closure, the State of Hawaii implements a complementary closure in state waters and prohibits any person from fishing for, possessing, or selling MHI Deep 7 bottomfish after the closure date. In addition, if NMFS and the Council determine that the final 2015–16 Deep 7 bottomfish catch exceeded the ACL, NMFS would reduce the Deep 7 bottomfish ACL for the 2016–17 fishing year by the amount of the overage.

Coordination and Public Involvement

The Council recommended the ACL and AM at its 163rd meeting held from June 16–18, 2015. The Council concluded its meeting with a recommendation that NMFS implement Alternative 4. This and other alternatives were developed in accordance with the approved ACL mechanism described in the Hawaii FEP and implementing federal regulations at 50 CFR 665.4, and in consideration of the best available scientific, commercial, and other information about the fishery. At its 163rd meeting, the Council considered and discussed the fishing level recommendations made by the SSC at their 119th meeting held from June 9–11, 2015. All meetings were open to the public and advertised in Hawaii media as well as the *Federal Register* (80 FR 30050, May 26, 2015), and on the Council's website. See Section 2.1.5 and 2.1.6 for a summary of the respective recommendations of the SSC and Council from these meetings. In addition to opportunities for interested members of the public, including fishermen, to address the Council at public meetings, NMFS made the draft EA available for a 15-day public review and comment period. NMFS received no public comments during the comment period.

Significance Analysis

NAO 216-6 contains criteria for determining the significance of the impacts of a proposed action. The Council on Environmental Quality (CEQ) regulations at 40 CFR 1508.27 state that the significance of an action should be analyzed in terms of both "context" and "intensity." The criteria listed below are relevant in making a finding of no significant impact and have been considered individually and collectively. We analyzed the significance of this action based on the NAO 216-6 criteria and the CEQ's context and intensity criteria. NAO 216-6, Section 6.01b, 1-

11 provides eleven criteria, including the same ten as in the CEQ regulations and one additional criterion for determining whether the impacts of a proposed action are significant. The following questions and answers apply to the analysis in the attached EA for the selected alternative (Alternative 4). The questions are consistent with NAO 216-6, CEQ criteria, and NMFS guidelines for the preparation of a FONSI (NMFS Instruction 30-124-1, July 22, 2005). The questions and responses are based on the analysis in the EA and form the basis for NMFS finding of no significant impact.

1) Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?

No. The proposed ACL of 326,000 lb of MHI Deep 7 bottomfish would be a 20,000 lb reduction compared with the ACL specified for each of the past 5 years (346,000 lb). The proposed ACL is intended to prevent overfishing and provide for continued sustainable harvest. Harvests of the MHI Deep 7 bottomfish stock complex are sustainable. The stock complex is not subject to overfishing and is not overfished, based on the best available scientific and commercial information (see stock status for MHI Deep 7 Bottomfish EA, section 3.1.1). The Council and NMFS developed the ACL to prevent overfishing and in consideration of the best available scientific information regarding stock status, historical and recent fishing, and estimates of potential impacts of fishing on the stock (see EA, section 2.1).

The ACL is lower than the stock's estimated overfishing limit (OFL) of 352,000 lb (i.e., the estimated level of catch associated with a 50% chance of overfishing the stock complex). Based on recent catches, catches of Deep 7 bottomfish in 2015–16 are expected to continue to be well below the ACL. Table 6 of the EA shows reported MHI Deep7 bottomfish catch in pounds by year through 2015. The catch in recent years has been no more than 309,485 lb/yr, and often much lower (EA, section 3.3.2).

NMFS does not anticipate that the action will result in changes in the conduct of MHI commercial or non-commercial bottomfish fisheries in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions (EA, section 2.2.4). Under the action, if the commercial fishery were to catch the entire ACL of 326,000 lb, the catch would be associated with a 44 percent probability of overfishing (EA, section 4.1.4: Alternative 4). The fishery is unlikely to exceed the ACL because of the in-season AM that requires the fishery to be closed if catches are projected to reach the ACL. NMFS is proposing the ACL and AM to prevent overfishing and ensure sustainable harvests. Together with other management measures such as permits, reporting, and monitoring, the proposed action will help ensure the MHI Deep 7 bottomfish fishery is sustainable (EA, section 4.1). For these reasons, NMFS does not expect the proposed action to have significant impacts on the sustainability of Deep 7 bottomfish.

2) Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?

No. The MHI Deep 7 bottomfish fishery is fairly target-specific. However, the fishery also harvests four species of jacks and three snappers that are termed the non-Deep 7 bottomfish. Catches of this group are dominated by uku, which comprises over 80% of the catches annually.

In 2014, total non-Deep 7 catches were 110,106 lb, with uku comprising 97,043 lb. Table 4 in section 3.1.2 of the EA provides a summary of non-Deep 7 bottomfish catches in the MHI from 2000–2014.

MSY for non-Deep 7 bottomfish has been calculated to be 265,000 lb, and catch associated with a 50 percent probability of exceeding MSY has been estimated to be 259,200 lb; therefore, the Council recently established 259,200 lb as the overfishing limit (OFL) for MHI non-Deep 7 bottomfish (see Stock Status of MHI Non-Deep 7 Bottomfish, EA, section 3.1.2). In a separate action, the Council recommended an ACL of 178,000 lb of non-Deep 7 bottomfish for the 2015 fishing year. As can be seen in Table 4, annual catch of non-Deep 7 bottomfish have been well below the MSY of 265,000 lb, the OFL proxy of 259,200 lb and the proposed ACL.

The specification of Deep 7 ACL for the 2015–16 fishing year is not expected to result in more fishing or greater catches of non-Deep 7 bottomfish because the Deep 7 fishery has caught no more than 309,485 lb of bottomfish in any recent fishing year, which is still 16,515 lb below the proposed ACL of 326,000 lb. In the 2012–13, 2013–14, and 2014–15 fishing years, the Deep 7 bottomfish fishery remained open throughout the fishing year. Under the proposed action, the total annual catch of non-Deep 7 bottomfish is expected to continue at or below the levels of recent years (110,106 lb –158,245 lb) and remain below the MSY of 265,000 lb and OFL of 259,200 lb (EA, section 4.1: Alternative 4).

Current levels of bycatch are described in the EA (section 3.13). Bycatch levels are expected to continue to remain low because the Deep 7 bottomfish fishery is fairly target specific and fish that are released or discarded are primarily non-Deep 7 bottomfish that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi, and white ulua). The Hawaii FEP includes ongoing management measures including training and outreach to fishermen to reduce the mortality of released fish due to barotrauma. These methods will continue to be taught and applied by fishermen. If sharks are caught on bottomfish hooks, because they don't suffer effects of barotrauma when brought up from depth, they are able to be released alive (EA, section 3.1.3). Fishermen tend to move to different areas if there is a problem with shark depredation on the target fish; this helps reduce the amount of shark bycatch.

Ongoing fisheries monitoring by the Council's FEP plan team and others will help fishery scientists and managers to detect any increase in non-target or bycatch issues and address them through future management measures, as needed (EA, section 4.1). Because catches of non-target MUS are sustainable, and the bottomfish fishery is target specific and does not have substantial issues related to bycatch, because the proposed ACLs for the next three fishing years are not expected to change the conduct of the fishery, and because monitoring and review of fishery performance will continue, the proposed Deep 7 bottomfish ACL and AM are not expected to result in significant impacts on non-target and bycatch in the fishery and the action is not expected to jeopardize the sustainability of any non-target species (EA, section 4.1.4).

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

No. To prevent and minimize adverse bottomfish fishing impacts to EFH, the Hawaii FEP prohibits the use of explosives, poisons, bottom trawls and other non-selective or destructive fishing gear. Weighted lines or baited hooks may come into contact with bottom substrates during bottomfish fishing operations, and may affect EFH and HAPC. Research to date, however, indicates that bottomfish fishingt, including gear deployment and a low level of anchor loss are not known to have adverse impacts to EFH (Kelley and Moffitt, 2004; Kelley and Ikehara, 2006). Bottomfish fishing methods are not known to cause substantial damage to the ocean, coastal habitats, corals, or marine habitats, including designated essential fish habitat (EFH) and habitat areas of particular concern (HAPC) for any species (EA, section 4.2).

The proposed action is not expected to change the way in which fisheries are conducted in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions. The proposed specification would not result in impacts to the Hawaii coastal zone that have not already been considered in previous consistency determinations (EA, section 5.7). For these reasons, NMFS concludes the proposed action will not lead to substantial physical, chemical, or biological alterations to ocean and coastal habitats, including designated EFH and HAPC (EA, sections 4.2 and 5.7).

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

No. The action is not expected to adversely impact public health or safety because the operation of bottomfish fisheries are not known to have such impacts, and are not expected to change because of the ACL and AM specifications (EA, Section 4.3). Current levels of catch of MHI bottomfish are below the proposed ACL of 326,000 lb, as well as the estimated MSY and OFL reference points. NMFS does not anticipate the action would result in changes in the conduct of the fishery in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions. Therefore, there is no likelihood the proposed ACL will result in a race for the fish, or cause fishermen to change the way they fish, or the areas they fish in, or to otherwise change the manner in which bottomfish fisheries are conducted. Additionally, bottomfish fishing activities are not known to result in public health issues. For these reasons, the action will not result in a substantial adverse impacts on public health or human safety at sea.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

No. To date, there have been no observed or reported interactions between MHI bottomfish fisheries and ESA-listed species. The NMFS 2008 Biological Opinion (BiOp) concluded that, except for the Hawaiian green sea turtle, the fishery is not likely to adversely affect any other ESA-listed marine species or result in the destruction or adverse modification of critical habitat (EA, section 3.6.1). All sea-going vessels, including bottomfish vessels, may impact green sea turtles. The 2008 BiOp anticipated that bottomfish vessels transiting state waters to and from federal fishing areas could collide with sea turtles and estimated an impact based on an estimated number of bottomfish fishing trips (71,800 per year).The total annual number of trips is more likely around 3,500 per year, however and NMFS ultimately determined based on the best

available information that the fishery likely has a very low level of impact on threatened green turtles (EA, section 3.6.1).

A 2013 consultation by NMFS on the MHI bottomfish fishery under the ESA concluded with the finding that bottomfish fisheries in the MHI are not likely to adversely affect MHI insular false killer whales because of 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 (EA, section 3.6.1). Section 3.6.2 of the EA describes that although several species of non-listed marine mammals occur in Hawaiian waters, there has been no observed or reported interaction between the MHI bottomfish fisheries and marine mammals. Additionally, seabirds are not known, and are unlikely, to interact with the MHI bottomfish fishery (EA, section 3.6.3).

Bottomfish fisheries in the MHI as authorized and managed under the Hawaii FEPs have been evaluated for impacts on protected species and are managed in compliance with the requirements of the Magnuson-Stevens Act, the Marine Mammal Protection Act, the Endangered Species Act, and other applicable laws. On December 29, 2014, NMFS published the final LOF for 2015, which classified the Hawaii bottomfish handline fishery as a Category 3 fishery under Section 118 of the MMPA (79 FR 77919). A Category 3 fishery is one with a remote likelihood or no known incidental morality and serious injury of marine mammals.

Because NMFS does not anticipate the action will result in changes in the conduct of the fishery in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions, the action will not have effects on endangered or threatened species, marine mammals, seabirds, or critical habitat that have not been previously considered or authorized in ESA consultations, MMPA determinations (EA, sections 4.5, 5.5, 5.6).

The EA also considered potential action by NMFS to designate areas in the MHI as monk seal critical habitat (76 FR 32026, June 2, 2011). On August 21, 2015, NMFS published a final rule to designate areas in the MHI as monk seal critical habitat (80 FR 50925). Specific areas for designation include sixteen occupied areas within the range of the species: ten areas in the Northwestern Hawaiian Islands and six in the MHI. 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 a line that marks mean lower low water. The August 21, 2015, final rule designating monk seal critical habitat in the MHI, triggered consultation on the continuation of the bottomfish fishery in the Hawaiian archipelago. In a memo dated March 1, 2016, the consultation concluded with a finding that the bottomfish fishery is not likely to adversely affect the designated Hawaiian monk seal critical habitat, because the effects of the proposed action are expected to be discountable or insignificant.

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

No. There have been no identified impacts to marine biodiversity and/or ecosystem function from the MHI bottomfish fisheries, and this action will not result in impacts to these environmental features. NMFS does not anticipate the proposed action will result in changes in the conduct of the fishery in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions. Therefore, NMFS expects no substantial impacts on biodiversity or ecosystem function to occur as a result of the proposed ACL specification (EA, section 4.6).

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

No. The analysis in the EA did not reveal any significant social or economic impacts interrelated with natural or physical environmental effects. The proposed action is not expected to change fishing operations and the fishery currently provides positive social and economic benefits to members of fishing communities (EA, section 4.3). The continuation of the recent ACL and AM are not expected to change income that is derived from bottomfish fishing or impacts on fishing communities (EA, section 4.3.2). Finally, overall, the action is intended to prevent overfishing of bottomfish stocks while providing positive social and economic benefits to fishermen, buyers and the fishing communities of Hawaii (EA, section 5.12).

The proposed specification is intended to provide for long-term sustainability of MHI Deep 7 bottomfish and would not change the manner in which the fishery is conducted. The specification would not result in disproportionately large and adverse impacts to health or the environment for members of environmental justice communities (EA section 5.12).

8) Are the effects on the quality of the human environment likely to be highly controversial?

No. The Council developed the recommended ACL and AM in a public process in accordance with the provisions of the Magnuson-Stevens Act, the FEPs, applicable regulations, considering the best scientific and commercial information available, and in coordination with fishery scientists, managers, other resource managers, and other interested parties (EA, sections 1.5, 2.1.3, 5.3 and 5.4). NMFS solicited comments on the ACL specification and AM and on the draft EA over a 15-day public comment period (EA, section 5.4). No public comments were submitted during the comment period. This public coordination revealed no controversy regarding effects on the quality of the human environment (EA, section 5.4). By providing for annual review of fishery performance, the action will help ensure long-term sustainability of MHI non-Deep 7 bottomfish, while allowing for optimal yield.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

No. NMFS does not expect the action to adversely affect such areas because no unique areas such as historic or cultural resources or marine protected areas are known to exist in the EEZ where the MHI bottomfish fishery is conducted. Because bottomfish fishing activities are not known to result in substantial adverse impacts to the environment including to designated EFH and HAPC (EA, sections 4.2, 4.7, and 5.8). Bottomfish fishing in marine protected areas will continue to be restricted by state laws, and fishing will continue to be subject to state of Hawaii commercial licensing and/or federal non-commercial permits and reporting and joint state/federal monitoring to help ensure harvests of marine resources remain sustainable. NMFS does not anticipate the action will result in changes in the conduct of the fishery in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions, and therefore, there would be no substantial impacts of the fisheries on resources of scientific, historic, cultural or economic importance. The proposed action would not have an impact on monk seal critical habitat in any way that is not already considered in fishery reviews under the ESA (See response to question 5).

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

No. The effects on the human environment are not highly uncertain or unknown because the action will result in the specification of an ACL for MHI Deep 7 bottomfish that is well below the stock's estimated MSY and OFL reference points, and managers considered the risk of overfishing when setting each ACL. Additionally, the AM are intended to prevent the fishery from exceeding the ACL so that overfishing does not occur and correct and mitigate any overage of the ACL. Furthermore, the effects of bottomfish fishing, managed under the FEP and associated regulations on target and non-stocks, protected resources, marine habitats and fishing communities are not highly uncertain or associated with unknown risks (EA, section 4). This is because the fishery is closely monitored and managers can take necessary precautions to ensure fishing is sustainable. For these reasons, the action is not expected to result in a change to the conduct of MHI bottomfish fishery in terms of gear types used, areas fished, or level of catch or effort as compared to baseline conditions and the effects of the action is not expected to result in effects that are highly uncertain or involve unique or unknown risks.

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

No. As discussed in section 4.8 of the EA, cumulative effects of the action were considered in light of other past, present and reasonably foreseeable future actions, including the specification of the ACL and AM in fishing years 2015–16, 2016–17 and 2017–18, and the specification of a separate ACL and AM for the MHI non-Deep 7 bottomfish stock complex. The analysis in section 4.8.1 (Cumulative Effects of the Proposed Action) indicates the action is not expected to result in significant adverse effects to MHI Deep 7 bottomfish. This is because NMFS will set the ACL (326,000 lb) lower than the stock's estimated MSY (404,000 lb) and OFL (352,000 lb). Furthermore, the action requires NMFS to close the fishery to prevent the ACL from being exceeded. Together, the specification of an ACL and AMs are intended to prevent overfishing

from occurring and ensure a sustainable fishery; while not resulting in changes to the manner in which the fishery is conducted.

Similarly, the analysis in section 4.8.2 indicates the action is not expected to result in cumulative effects to MHI non-Deep 7 bottomfish. This is because under the action the fishery is not expected to reach the ACL of 326,000 lb. Because a fishery closure is not expected, it is unlikely that fishermen would need to switch to catching non-Deep 7 bottomfish in order to fill market demand for bottomfish. If the fishery closure were to be triggered, because the ACL is 326,000 lb, the fishery is not expected to close long before the end of the fishing year, and catches of non-Deep 7 bottomfish are expected to be no greater than the 2013 level of catch of 158,245 lb. This level of catch is well below the MSY for non-Deep 7 bottomfish of 265,000 lb and the OFL proxy of 259,200 lb. Under the proposed action, catches of non-Deep 7 bottomfish are expected to remain sustainable.

The EA evaluated potential cumulative effects resulting from the specification of ACLs and AMs for other crustacean, precious coral, and coral reef MUS managed under the Hawaii FEP (EA, section 4.8.3). None of the ongoing proposals are likely to result in significant environmental effects because those proposals are not expected to change conduct of any fishery in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions for those fisheries. The EA also includes the agency's consideration of the potential for interaction among these initiatives and none was found that would result in a significant cumulative effect because the ACL and AM apply to fishery-specific MUS, and do not overlap.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

No. As described in the EA (sections 4.7 and 5.8) there are no known districts, sites, highways, structures or objects listed, or eligible for listing, in the National Register of Historic Places where NMFS authorizes bottomfish fishing. Although shipwrecks and other objects could possibly occur in federal waters around Oahu, bottomfish fishing is not known to result in adverse impacts to scientific, historical, cultural or historical resources because fishermen fish for bottomfish on high-relief deep slopes where such objects would not be found (EA, section 4.7). Also, bottomfish fishing is not known to have a damaging impact on the marine environment, including any man-made resources or structures (EA, section 5.8). The specification of ACL and AM will not change the way the MHI bottomfish fishery is conducted, including type of gear used, areas fished, or level of catch or effort as compared with baseline conditions and therefore, the fishery is not expected to cause loss or destruction of significant scientific, cultural or historic resources that may occur in the EEZ (EA, section 4.7).

13) Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

No. Bottomfish fishing is not known to be a potential vector for spreading alien species as none of the vessels fish outside of Hawaiian waters. NMFS does not anticipate the proposed action

will result in changes in the conduct of the fishery in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions, so the proposed action will not result in the introduction or spread of a non-indigenous species (EA, section 4.6).

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

No. The proposed action is needed to comply with provisions of the Magnuson-Stevens Act and federal regulations implementing the FEPs at 50 CFR 665.4, through which NMFS specifies ACLs and AMs. Since 2011, NMFS has specified an ACL and post-season AMs for MHI Deep 7 bottomfish, so the proposed action does not establish a precedent regarding how the fishery is managed. Operation of the fishery under ACLs and AMs does not result in a decision in principle about future considerations because the fishery will continue to be monitored. Each year, NMFS and the Council will evaluate catches against the ACL and may reduce the ACL in a subsequent year in order to mitigate overages of an ACL if it occurs. MHI bottomfish fisheries as managed under ACLs and AMs are not expected to result in overfishing or in stocks that become overfished. Furthermore, the specification of an ACL and AM in one year does not automatically result in a specific ACL or AM in other future years. NMFS does not anticipate the proposed action would result in changes in the conduct of the fishery in terms of gear types used, areas fished, level of catch or effort as compared to baseline conditions. For these reasons, the proposed action will not establish a precedent for future actions with significant effects or represent a decision in principle about future decisions.

15) Can the proposed action reasonably be expected to threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment?

No. The Council developed the recommended ACL and AM in a public process in accordance with the provisions of the Magnuson-Stevens Act, the FEP, considering the best scientific and commercial information available, and in coordination with fishery scientists, managers, other resource managers, and other interested parties and no such violation of law was revealed (EA, sections 1.5, 2.1.3, 5.3 and 5.4). NMFS also provided additional opportunity for public review and comment on the specifications and draft EA and received no comments indicating the action threatened a violation of such laws. Additionally, NMFS evaluated the action for compliance with the Magnuson-Stevens Act, the Endangered Species Act, and the Marine Mammal Protection Act, and other applicable state and federal laws (EA, sections 4 and 5).

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

No. In section 4.8 of the EA, NMFS evaluated the potential for cumulative effects of the action on target and non-target stocks, considering the specification of a multi-year ACL and AM for MHI Deep 7 bottomfish, the related ACL and AM specifications for MHI non-Deep7 bottomfish and other Hawaii FEP fisheries, foreseeable future federal fishery management actions, other NOAA actions, climate change, and other considerations (EA, sections 4.8.5, 4.8.6 and 4.8.7). The analysis found that NMFS does not expect the action to result in cumulative impacts that

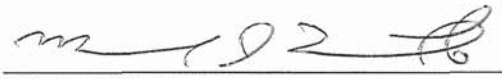
could have a substantial effect on target and non-target species. Please also see answers to questions #2 and #11 above.

Other Findings

NMFS considered the effects of this action on climate change, and climate change impacts on the feasibility of the proposed action (EA, section 4.8.7). We do not expect climate change to adversely affect the effectiveness of the ACL and AM specifications in providing for sustainable levels of fishing for BMUS. Recent catches relative to the current estimates of MSY and OFL informed the development of the ACL and AM (EA, section 2.1.4). Monitoring of the fishery will continue and, if stocks are being affected as a result of climate change, the ACL and other management measures can be adjusted to reduce fishing impacts on stocks. We do not expect the action to result in a change to the manner in which the fisheries are conducted, so no change in greenhouse gas emissions is expected.

Determination

Based on the information in this document and the EA, I have determined that the impact of implementing this action will not significantly impact the quality of the human environment. We have addressed all beneficial and adverse impacts of the action to reach the conclusion of no significant impact. Accordingly, the preparation of an Environmental Impact Statement for this action is not necessary.



MAR 18 2016

Michael D. Tosatto
Regional Administrator

Date