WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

ACTION PLAN TEAM WORKING DRAFT

Specification of Annual Catch Limits and Accountability Measures for Main Hawaiian Islands Uku in Fishing Years 2026, 2027, 2028, and 2029

With Environmental Assessment

Regulatory Identification Number (RIN) 0648-XXXX

Prepared by the Western Pacific Regional Fishery Management Council

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1 Introduction

1.1 Background information

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) established the Western Pacific Fishery Management Council (WPFMC, or the Council) in 1976 to develop management plans for fisheries within the United States Fishery Conservation Zone around Hawaii, U.S. Pacific territories, commonwealth, and possessions of the United States in the Pacific Ocean (16 U.S.C. § 1801 *et seq.*). In the Main Hawaiian Islands (MHI), the National Marine Fisheries Service (NMFS) and the Council manage uku, in accordance with the Fishery Ecosystem Plan (FEP) for the Hawaii Archipelago (Hawaii FEP) and implementing regulations under Title 50 Code of Federal Regulations, Part 665 (50 CFR 665). This action pertains to management of uku, a bottomfish species. At present, the only active fisheries for uku in Hawaii are in the MHI, which includes the islands of Niihau, Kauai, Oahu, Molokai, Lanai, Kahoolawe, Maui, and Hawaii. Historically, the fisheries for Hawaii bottomfish operated in two management subareas: the inhabited MHI and the Northwestern Hawaiian Islands (NWHI), a 1,200 nm chain of largely uninhabited islets, reefs, and shoals. In 2009, NMFS closed the NWHI fishery in accordance with provisions of the Presidential Proclamation establishing the Papahānaumokuākea Marine National Monument and prohibiting commercial fishing (71 FR 51134, August 29, 2006). For the MHI uku fishery, the fishing year begins January 1 and ends on December 31. See 50 CFR 665 – Subpart C for federal regulations applicable to bottomfish fishing in Hawaii. Fishermen must comply with federal requirements for vessel identification, non-commercial fishing permits, and non-commercial catch and effort logbooks.

In accordance with the Magnuson-Stevens Act, the FEP and implementing regulations at 50 CFR 600.310, each Council's Scientific and Statistical Committee (SSC) must provide its Regional Fishery Management Council recommendations for acceptable biological catch (ABC). The ABC is defined as a level of annual catch, which is based on an ABC control rule that accounts for the scientific uncertainty in the estimate of the overfishing limit (OFL), any other scientific uncertainty, and the Council's risk policy. NMFS must specify an annual catch limit (ACL) and implement accountability measures (AM) for BMUS. ACLs are recommended by the Council in consideration of the best available scientific, commercial, and other information about the fishery for that stock or stock complex. The ACL may not exceed the ABC recommended by the Council's SSC.

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) Department of Aquatic Resources (DAR). State law requires all commercial fishermen to annually obtain a commercial marine license (CML) and report all catches within five days of the end of each fishing trip. Non-commercial uku catch is estimated using data from the Hawaii Marine Recreational Fisheries Survey (HMRFS) and Marine Recreational Informal Program (MRIP), in a collaboration between the State of Hawaii and NMFS. The State interviews non-commercial fishermen returning from fishing trips and collects information on fishing effort, location, and catch. Using the CML, HMRFS, and MRIP data, NMFS and the Council can monitor commercial and non-commercial uku catch relative to the ACLs and annal catch targets (ACT). If NMFS closes the uku fishery in Federal waters because it is projected to reach an ACL or ACT (50 CFR 665.211(b)), the Hawaii DLNR currently does not have the

mechanism to close the uku fishery in State waters. Currently, a fishery closure for uku in Federal waters would not restrict fishing and harvest in State waters. See the DLNR website for all state regulations applicable to bottomfish fishing in Hawaii (http://dlnr.hawaii.gov/dar/).

1.2 Proposed Action

The proposed action is to specify ACLs, ACTs, and AMs for MHI uku managed under the Hawaii FEP for fishing years 2026 through 2029.

1.3 Purpose and Need

The purpose and need for this action are the same as described in the 2021 EA, Section 1.3 (NMFS 2022a). The purpose of this action is to specify ACLs, ACTs, and AMs for MHI uku for fishing years 2026 through 2028 based on the results of the 2024 stock assessment update (Nadon 2024). Doing so will comply with the requirements of the Magnuson-Stevens Act, the Hawaii FEP, and implementing regulations that require the implementation of ACLs, ACTs, and AMs for MHI uku. This action is needed to prevent overfishing and provide long-term sustainability of fishery resources while allowing fishery participants to continue to benefit from their utilization. AMs are needed to reduce the potential of exceeding an ACL or ACT and are used to correct or mitigate overages of the ACL should they occur. The Council may consider recommending application of the status quo AMs or to revise the AMs.

1.4 Action Area

The action area is the same as described in the 2022 EA, Section 1.4. The action area is waters where fishing for uku occurs in State and Federal waters of the MHI. Bottomfish fishing occurs primarily in waters from 80–400 m deep from the Island of Hawaii to Niihau Island. Waters around islands northwest of Niihau are not part of the action area because bottomfish fishing is prohibited in Papahānaumokuākea Marine National Monument.

1.5 Best Scientific Information Available

In 2024, the NMFS Pacific Islands Fisheries Science Center (PIFSC) conducted a stock assessment update for the MHI uku fishery using data from 1949 through 2023 (Nadon 2024). The 2024 stock assessment update used the same Stock Synthesis modeling approach (Methot and Wetzel 2013) as the 2020 benchmark assessment (Nadon et al. 2020). The model fit uku catch and effort data from the commercial catch reports and added data from 2019 to 2023 and the fishery-independent diver surveys from 2019. The only change to the modeling approach was implementation of correction factors for the recreational fishery performance related to changes in effort sampling associated with the decline of phone landlines between 2003 and 2016, as done in the recent Deep-7 assessment (Syslo et al. 2024). The stock assessment update provided additional years of catch projections with risks of overfishing for various catch levels from 2025 to 2031.

Overall, the stock assessment indicated that the uku stock was neither overfished nor experiencing overfishing in 2023 (Table 1). The OFL was estimated to be at 497 to 398 thousand lb from fishing years 2026 to 2031, respectively.

Table 1 compares reference point values from the 2020 benchmark assessment and the 2024 assessment update. The MHI uku maximum sustainable yield (MSY) increased between the two assessments. It is not clear what could be driving a recent trend of strong recruitment contributed to the increased MSY estimate. The harvest rate in the terminal year and the harvest rate at MSY nominally decreased. The F/F_{MSY} ratio and the probability that overfishing is occurring also decreased. The biomass for MHI uku increased by 176 mt (219,597 lb), and the biomass at MSY and B/B_{MSY} also increased. Thus, the probability that the stock is overfished decreased. The OFL in the terminal year increased by 133,380 lb.

Table 1. Comparative table of the reference points between the 2020 benchmark stock assessment and the 2024 assessment update.

Parameter	2020	2024
MSY	93 mt (205,030 lb)	111 mt (244,713 lb)
F	0.08	0.05
F_{MSY}	0.14	0.14
F/F_{MSY}	In 2018 = 0.57 (no overfishing)	In 2023 = 0.36 (no overfishing)
B	819 mt (1,805,584 lb)	995 mt (2,193,597 lb)
B_{MSY}	301 mt (663,591 lb)	394 mt (868,620 lb)
B/B_{MSY}	2.7 (not overfished)	2.8 (not overfished)
SPR	0.4	0.61

Sources: Nadon et al. (2020) and Nadon (2024).

Table 2 shows the MHI uku non-commercial and commercial catch from the recent four years. The total estimated catch of MHI uku from both commercial and non-commercial fishery sectors is generally stable over time, with the average over the last three years being 247,381 lb. This corresponds to 84 and 85 percent of the current ACL and ACT, respectively.

Table 2. Recent history of ACL and ACT for the MHI uku fishery. For each ACT and ACL specified, the fishery has an in-season monitoring and post-season overage adjustment AMs.

Year	Total Estimated Non-Commercial Catch (lb)[1]	Commercial Catch (lb)	Total Estimated landed (lb)	Council Recommended ACL/ACT (lb)	Proportion of ACL or ACT caught
2019	69,089	90,016	159,105	127,205	70.8%
2020	206,827	48,038	254,865	127,205	37.8%
2021	160,347	60,363	220,710	295,419	47.5%
2022	242,901	52,973	295,874	295,419	100.2%
2023	180,545	45,012	225,557	295,419	76.4%
$Average_{21-23}$	**194,381**	**52,783**	**247,381**		

Source: WPRFMC (2024).

[1] Estimates for non-commercial catch are derived by HMRFS catch expansion conducted by NMFS with a >40 percent CV for each fishing year

1.6 Overview of ACL and AM Development Process

Federal regulations at 50 CFR 665.4 (76 FR 37285, June 27, 2011) require NMFS to implement an ACL and AM(s), as recommended by the Council, based on the best scientific, commercial, and other information available for the fishery. In accordance with the Magnuson-Stevens Act and the Hawaii FEP, there are three required elements in the development of an ACL as shown in Figure 1: calculating the ABC, determining an ACL that may not exceed the ABC, and developing AMs.

First, the Council's SSC calculates an ABC that is set at or below the stocks OFL. The OFL is an estimate of the catch level above which overfishing is occurring and corresponds with the MFMT. In accordance with Federal regulations at 50 CFR 600.310 implementing National Standard 1 of the Magnuson-Stevens Act, the probability of overfishing (P*, pronounced P-star) cannot exceed 50 percent and should be a lower value. Thus, the ABC is the maximum amount the fishery can catch that provides at least a 50 percent chance, or better, of not overfishing the stock.

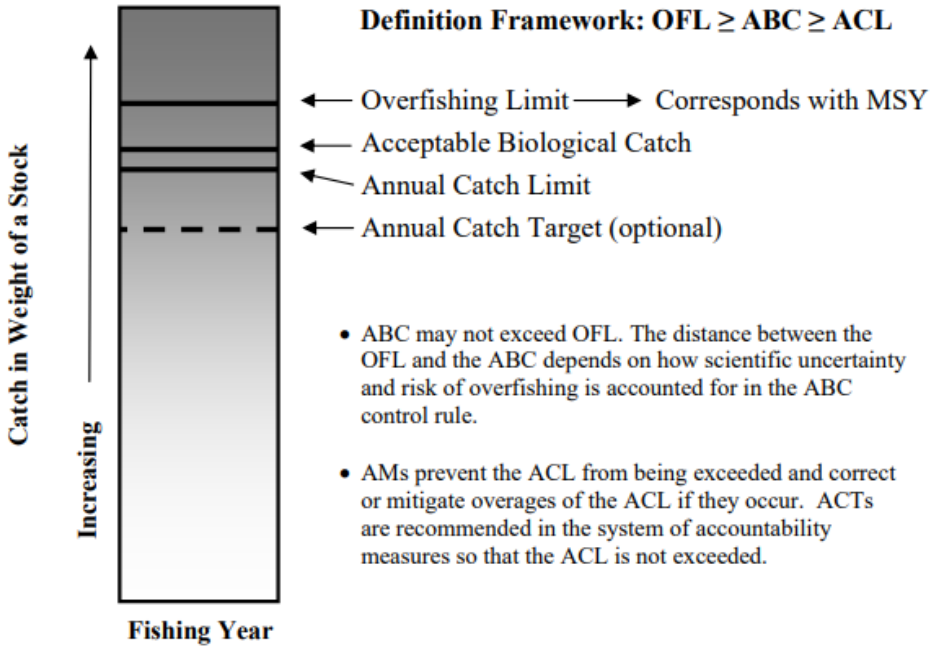

Figure 1. Relationship between OFL, ABC, ACL, and ACT.

Second, the Council must recommend an ACL that does not exceed the ABC recommended by the SSC. An ACL set below the ABC further reduces the probability that actual catch will exceed the ABC or OFL and result in overfishing. The SSC may reduce the ABC below the OFL considering factors evaluated in a P* analysis. The Council may then reduce the ACL below the ABC in consideration of social, economic, ecological, and management (SEEM) factors in a SEEM analysis (see Hospital et al. 2019 for SEEM considerations.). While the P* analysis considers management uncertainty arising from underreporting and misreporting of catch, the SEEM analysis is more forward-looking and considers uncertainty arising from concerns about compliance and/or management capacity.

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 closing the fishery, closing specific areas, changing bag limits, setting an annual catch target (ACT), or other methods to reduce catch. Post-season AMs reduce the ACL and/or ACT in subsequent years if the ACL is exceeded to mitigate potential impacts to fish stocks. Additionally, National Standard 1 and the FEP describe performance standards that identify conditions when a system of ACLs and AMs should be reevaluated. Generally, if any fishery exceeds an ACL more than once in a four-year period, as a performance standard the Council is required to re-evaluate the ACL process for that fishery and adjust the system as necessary to improve its performance and effectiveness in ensuring sustainability of the fishery. The Council can also choose a higher performance standard to provide more conservative management for vulnerable stocks.

1.7 Public Review and Involvement

NMFS and the Council provided several opportunities to the public to provide input on the development of the proposed ACL and AMs. At its 153rd meeting in December 2024, the Council's SSC considered and discussed the outcomes of the peer-review from the report of the Western Pacific Stock Assessment Review (WPSAR) Panel Chair, Dr. Erik Franklin. In the same meeting, the PIFSC released the final 2024 stock assessment for the MHI uku stock (Nadon 2024) incorporating the recommendations from the WPSAR review (Franklin et al. 2024). The SSC considered this benchmark assessment as the best scientific information available (BSIA) for the MHI uku fishery for the purposes of determining stock status and setting harvest limits. At its 201st meeting in December 2024, the Council received a presentation from PIFSC on the assessment update, accepted the SSC BSIA recommendation, and directed staff to develop potential ABC and ACLs for initial action at the 202nd meeting in March 2025. Both the Council and SSC meetings were open to the public and advertised through notices in the *Federal Register* (89 FR 228, November 26, 2024) and on the Council's website.

At its 202nd meeting on March 25, 2025, the Council considered and discussed issues relevant to specifying ACLs and AM for the MHI uku fishery, including the ABC recommendations from the SSC at its 155th meeting held March 11-13, 2025. At its 155th meeting, the SSC recommended setting the ABCs based on the 2020 P* analysis of 43 percent risk of overfishing correlated with 408,957 lb. At its 202nd meeting, the Council accepted the SSC's recommendation of setting the ABC based on the P* analysis reduction and took initial action on an ACL based on the P* and SEEM reduction scores corresponding to a risk of overfishing level of 36 percent at 401,020 lb. Both the Council and SSC meetings were open to the public and advertised through notices in the *Federal Register* (90 FR 35, February 24, 2025; 90 FR 40, March 7, 2025) and on the Council's website.

1.8 NEPA Compliance

We prepared this EA in accordance with the National Environmental Policy Act (NEPA; 42 U.S.C. 4321, et seq.) and related authorities, and NOAA's "Policy and Procedures for Compliance with the National Environmental Policy Act and Related Authorities Companion Manual for NOAA Administrative Order (NAO) 216-6A - Effective Jan 13, 2017" (Companion Manual).

1.9 Decisions to be Made

The Council's task is to recommend a preliminary preferred alternative to specify ACLs derived from the ABCs recommended by the SSC and recommend AMs for MHI uku for fishing years 2026 through 2028. The Council's specification process allows setting an ACL for a maximum of four years. The ACLs may not exceed the ABCs set by the SSC in accordance with implementing regulations for National Standard 1 of the Magnuson-Stevens Act (50 CFR 600.310). The Council's ACL process is described in the FEP and includes methods by which the ACL may be reduced from the ABC based on management uncertainties through a SEEM analysis. The Council may consider AMs to prevent overfishing that will include to the decision to implement the in-season closure through tracking of commercial catch derived from the State of Hawaii FRS and non-commercial catch derived from catch expansions of the Hawaii marine recreational fishing survey (HMRFS).

1.10 List of Preparers

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2 Descriptions of the Alternatives

2.1 Development of the Alternatives

The Council and its SSC used the approved process, described previously (section 1.6) and detailed in WPFMC and NMFS (2011), to develop its ACL recommendations for the uku fishery for 2026 through 2029. The process started with a new stock assessment update (Nadon 2024) based on fisheries information and uku biology, which resulted in estimation of the OFL. The stock assessment was reviewed through WPSAR and again through the SSC and it was determined to be the BSIA for management. The SSC then applied the P* to recommend the ABC. The Council then specified the ACL and considered AMs to prevent overfishing. The action alternatives under consideration are based upon the best available scientific, commercial, and non-commercial catch and other information about the uku fishery.

2.1.1 *Estimation of OFL*

Estimated posterior distributions of base case assessment model parameters were used in forward projections for fishing years 2026–2029 to estimate the probability of overfishing, P*, from 2025–2031 under alternative future catches (Nadon 2024). The projection results accounted for uncertainty in the distribution of estimates of model parameters from the posterior of the base case model. The projections were conducted assuming each value for the future total catch was constant for each fishing year from 2025 through 2031. Projections were used to compute reported catches from 2026–2031 that would produce probabilities of overfishing varying from 0

percent to 50 percent at intervals of 1 percent. We consider the future catch corresponding to a 50 percent risk of overfishing can be considered the OFL (Table 3), which is 418,437 lb of uku in 2029.

Table 3. Uku probabilities of overfishing (percent) in fishing years 2026 through 2028.

P*	2026	2027	2028	2029
0.5	467,379	448,420	431,003	418,437
0.49	466,498	447,097	429,680	417,114
0.48	465,836	445,774	428,358	415,571
0.47	464,954	444,451	427,035	414,248
0.46	464,073	443,129	425,933	412,925
0.45	462,970	441,806	424,610	411,603
0.44	461,868	440,704	423,508	410,280
0.43	460,986	439,381	422,405	408,957
0.42	459,663	438,058	421,082	407,855
0.41	458,561	436,956	419,980	406,532
0.4	457,238	435,633	418,878	405,430
0.39	455,915	434,531	417,775	404,327
0.38	454,593	433,208	416,673	403,225
0.37	453,270	431,885	415,571	402,123
0.36	451,947	430,783	414,469	401,020
0.35	450,404	429,460	413,146	399,918
0.34	448,861	428,137	412,043	398,816
0.33	447,317	426,814	410,941	397,713
0.32	445,774	425,492	409,618	396,611
0.31	444,010	424,169	408,516	395,509
0.3	442,467	422,846	407,193	394,407
0.29	440,704	421,523	406,091	393,304
0.28	438,940	419,980	404,768	391,981
0.27	437,176	418,657	403,445	390,879
0.26	435,412	417,114	401,902	389,556
0.25	433,428	415,571	400,579	388,234
0.24	431,665	413,807	399,036	386,911
0.23	429,680	412,264	397,493	385,588
0.22	427,696	410,500	395,950	384,265
0.21	425,712	408,737	394,407	382,722
0.2	423,728	406,752	392,643	381,179
0.19	421,744	404,989	391,100	379,636
0.18	419,760	403,005	389,115	377,872
0.17	417,775	401,020	387,352	376,108
0.16	415,571	398,816	385,368	374,344
0.15	413,587	396,611	383,383	372,581
0.14	411,382	394,407	381,179	370,597
0.13	409,398	391,981	379,195	368,612

P*	2026	2027	2028	2029
0.12	407,193	389,556	376,770	366,408
0.11	404,989	386,911	374,565	364,203
0.1	402,784	384,265	372,140	361,999

Source: Nadon (2024).

2.1.2 *Stock Status*

Under all of the western Pacific FEPs, overfishing occurs when the fishing mortality rate (F) is greater than the fishing mortality rate that produces MSY (F_{MSY}) for one year or more. This threshold is termed the maximum fishing mortality threshold (MFMT) and is expressed as a ratio, $F_{year}/F_{MSY} = 1.0$. Thus, if the F_{year}/F_{MSY} ratio is greater than 1.0 for one year or more, overfishing is occurring. For the MHI uku stock, catch averaged over three years is used to calculate F_{year}. A stock is considered overfished when its biomass (B) has declined below the level necessary to produce MSY on a continuing basis (B_{MSY}). This threshold is termed the minimum stock size threshold (MSST) and is expressed as a ratio, $B/B_{MSY} = 0.7$. Thus, if the B/B_{MSY} ratio is less than 0.7, the stock complex is considered overfished.

In 2023, the most recent year for which catch information is available, $F/F_{MSY} = 0.36$ while $B_{2023}/B_{MSY} = 2.7$ (Nadon 2024; Table 1). The model results indicate that the MHI uku stock complex was not experiencing overfishing and was not overfished as of 2023 (Table 1).

Participation in the MHI uku fishery varies from year to year. Since 2015, the fishery has steadily declined from 417 CML holders to a low of 217 CML holders in 2023 (Figure 2; Table 4). Over the past four years, there have been anywhere between 217 and 253 CML holders participating in the fishery, accounting for a range of 830 to 1,006 trips annually (Figure 2; Table 4).

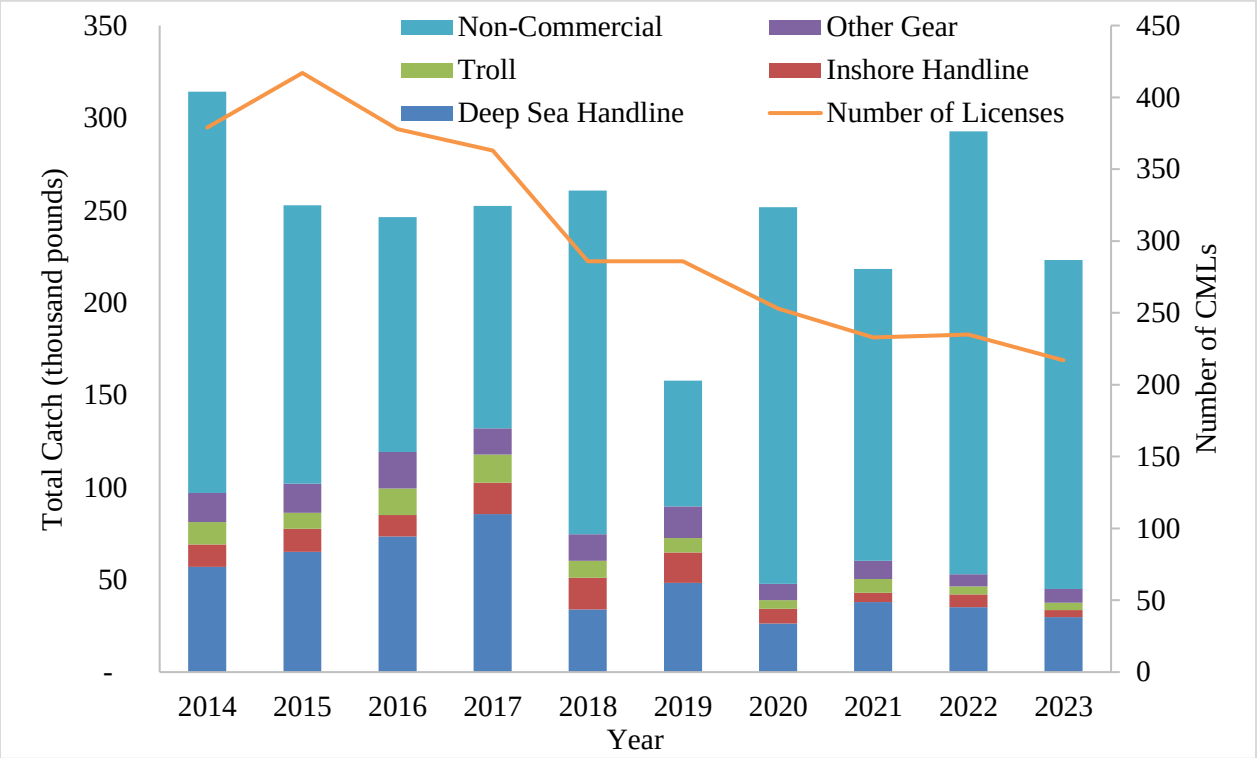

Figure 2. Total commercial landings of uku by gear type from CML reports, estimated total non-commercial landings from HMRFS expansions, and the number of CML holders reporting uku catch in the MHI from 2014 to 2023.
Source: WPFMC (2024).

Table 4. Annual MHI uku commercial and non-commercial fishery performance parameters from 2014 to 2023. Catch per unit effort (CPUE) indices account for only commercial fishing.

Year	Number of CMLs	Number of Fishing Trips	Total Reported Catch (lb)*	Total Non-Commercial Catch (lb)*	Deep-Sea Handline CPUE (lb/trip)	Inshore Handline CPUE (lb/trip)	Troll with bait CPUE (lb/trip)	All other gear CPUE (lb/trip)
2014	379	1,679	96,893	217,376	79.44	44.04	42.14	40.22
2015	417	1,846	101,920	150,796	83.55	36.39	36.88	32.51
2016	378	1,914	119,226	126,986	89.25	37.39	57.3	37.16
2017	363	1,776	131,947	120,372	94.97	53.32	90.84	40.33
2018	286	1,235	74,648	186,070	72.52	63.6	56.09	45.37
2019	286	1,295	89,640	68,123	91.36	63.55	37.95	53.62
2020	253	1,031	47,796	203,927	64.52	35.73	38.26	32.66
2021	233	1,006	60,230	158,071	84.64	35.97	42.93	40.59
2022	235	895	53,021	239,642	75.32	65.47	36.27	32.12
2023	217	830	44,974	178,133	72.4	44	29.8	33.9
Avg.2021-2023	**228**	**910**	**52,742**	**191,949**	**77.5**	**48.5**	**36.3**	**35.5**

Sources: *Nadon (2024); WPFMC (2024).

2.1.3 *Calculation of ABC, ACL, and ACT*

Scientific Uncertainties

The omnibus FEP amendment that established the ACL specification process requires the SSC to review the stock's scientific information and assign it a tier in the ABC control rule (WPFMC and NMFS 2011). The MHI uku stock is considered a tier 1 stock. Therefore, a P* analysis is used to quantify the scientific uncertainty in determining the appropriate risk level to set the ABC. The SSC may recommend an ABC that differs from the result of the 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, but must explain their rationale.

The stock assessment update did not use new information that changes the score for the Assessment Information dimension. The update added three years of fishery-dependent and one new year of fishery independent data from the diver survey. Regarding sources for mortality, it was not clear if the assessment accounted for post-release and shark depredation mortality. Fishers present at the P* Working Group stated that uku are resilient and that shark depredation has existed in the fishery for a long time. Thus, the Assessment Information dimension retains a reduction of 0.7. The Uncertainty Characterization score also did not change with the new assessment update. The uncertainty surrounding the lack of process error in the projection of OFL remains the same, while the uncertainty surrounding the single point estimate of biomass from the 2020 P* analysis reduced due to the inclusion of additional years of data (WPFMC 2020a). The biomass estimate from 2020 was revised upwards. Thus, maintaining the score for this dimension is precautionary. The Stock Status dimension did not change and remained as not overfished and not experiencing overfishing. There was no new life history information incorporated in the assessment update. The level of fishery susceptibility remains the same, noting the catch trend was decreasing over time (WPFMC 2020a).

Table 5. P* scores for the 2020 ABC setting.

P* Dimensions and Criteria	2020
Assessment Information	**-0.7**
Reliable catch history	*0.5 : unreported and recreational catch*
Standardized CPUE	*0.0 : improved standardization*
Species specific data	*0.0 : single species assessment*
All sources of mortality accounted for	*0.0 : all known uncertainty accounted for*
Fishery independent data	*0.0 : diver survey data included*
Tagging data	*1.0 : not included*
Spatial analysis	*1.0 : not included*
Uncertainty Characterization	**-2.5 : narrowed to 2 uncertainties**
Stock Status	**-0.0 : species complex**
Productivity/Susceptibility	**-4.2 : same P and S**
TOTAL BUFFER	**-7.4 ≈ 7.0**

Social, Economic, Ecological and Management Uncertainty

The SEEM analysis in 2020 for the benchmark assessment (WPFMC 2020b) discussed possible allocation scenarios between the commercial and non-commercial sectors. During this SEEM working group meeting, the State of Hawai‘i indicated that it currently does not have the mechanism to close down the uku fishery in State waters, and the SEEM score should reflect this situation. The State of Hawai‘i is able to track commercial catch in-season through the CML program. Hawai‘i is unable to track non-commercial catch in-season using HMRFS, as the analysis of effort and creel survey data that comprise those estimates is delayed by several months. In addition to the management and monitoring uncertainties quantified, the working group provided scores for the social and economic criteria and agreed to a total SEEM reduction score of 7, which would lead to a two percent buffer from the ABC for the ACL and a five percent buffer between the ACL and ACT.

Table 6. SEEM scores for the setting the ABC in 2020, indicating no change in the criteria scores.

SEEM Dimensions	2020
Social	*-1.0 : average based on social importance*
Economic	*-0.9 : not specific to a gear type*
Ecological	*-0.0 : no reduction*
Management & Monitoring	*-5.1 : uncertainty in complementary management and HMRFS reporting*
TOTAL BUFFER	**-7.0** :

2.2 Description of Alternatives

2.2.1 *Alternative 1: No Action – Do not specify ACL or AMs*

Under Alternative 1, the Council would not recommend the specification of ACLs for the MHI uku fishery for fishing years 2026 through 2029. This alternative would not be consistent with Magnuson-Stevens Act requirements (50 CFR 665.4) or the provisions of the Hawaii FEP that require NMFS to specify an ACL and AMs for all federally managed stocks and stock complexes.

Expected Fishery Outcome

Under this alternative, not specifying an ACL or AM is not expected to result in large changes to the conduct of the fishery, including gear types used, areas fished, level of catch or effort, target and non-target stocks, or protected species. This continuity is expected because, based upon the best available commercial and scientific information, the MHI uku fishery has not been constrained by catch limits in recent years; the fishery has not reached the ACL in recent years and has remained open year-round. Under MSY and OFL from the 2024 stock assessment (Nadon 2024), the fishery was not overfished nor experiencing overfishing as of 2023. As shown in Table 4, catches of uku have consistently remained below previous catch limits as well as OFL and MSY estimates. In 2022, the annual catch of uku was 0.2 percent over the ACT based on post-season information but was not detected using in-season monitoring. In-season monitoring was limited by the availability of non-commercial catch estimates derived from the HMRFS data expansion, which were incomplete before the fishing year end. Based on the findings of the 2024

stock assessment update, if the fishery were to perform similar to 2022, then this catch level would be associated with a risk of overfishing less than 10 percent. In summary, under Alternative 1, even without an ACL or AMs, the MHI uku fishery is expected to fish in the same way it has fished in recent years. Uku catches, non-target catches, and other interactions with the affected environment would be similar as those from recent years as well.

2.2.2 *Alternative 2: Specify ACL at P*=41 percent and ACT at P*=36 percent based on P* and SEEM analysis with both in-season and post-season AMs (Nadon et al. 2020)*

Under Alternative 2, the Council would recommend specification of ACLs for the MHI uku based on the results of the 2020 stock assessment update and the associated P* and SEEM analysis for fishing years 2026 through 2029. This option, however, does not comply with National Standard 2 on the use of the BSIA. The 2024 benchmark stock assessment underwent a peer-review and was presented to the SSC in December 2024, and the SSC declared it as the BSIA based on the SSC report submitted to the Council at its 202nd meeting in March 2025. Based on the 2024 benchmark assessment, the level of catch associated with a 41 percent risk of overfishing is 414,902 lb.

The ACT was previously recommended by the Council to address uncertainty in the in-season estimates of non-commercial catch and reduce the likelihood of exceeding the ACL given those uncertainties.

To project when the total catch would reach the ACT, NMFS and Council would develop in-season estimates by combining commercial and non-commercial catch information collected by the State of Hawaii and NMFS as described in Section 1.1 above. The State compiles commercial fishing reports on a monthly schedule that are available roughly 5 to 10 days after each month's fishing is completed. The HMRFS non-commercial catch estimates are developed in six two-month waves during each year that are available about 45 days after the end of each wave. NMFS will estimate the total annual catch in-season adding these in-season catch reports plus future catch estimates for the remaining months based on average catches for those months in recent past years. This method is similar to that used for projecting catch in the Deep 7 bottomfish and bigeye tuna fisheries.

As an in-season AM, NMFS would close Federal waters to commercial and non-commercial uku retention for the remainder of the fishing year when the combined commercial and non-commercial catch are projected to reach the ACT. Once Federal waters are closed, uku caught while fishing in Federal waters would be required to be released. State waters would not close and uku caught commercially there could be sold.

When finalized annual catch estimates are available after each fishing year, NMFS and the Council would review the total catch, averaged over the most recent three years, and compare it to the ACL. If the average total catch over the most recent three years exceeded the ACL, both the ACL and ACT would be reduced by the amount of the overage for the following year. If the ACL was exceeded in more than one year during the 2026-2029 period, Council would re-evaluate uku management as required under Magnuson-Stevens Act implementing regulations.

Expected Fishery Outcome

Under Alternative 2, the specification of an ACL of 295,419 lb 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 would be the same level of ACL as specified for fishing years between 2022 and 2025. Under Alternative 2, the fishery is not likely to reach the ACT of 291,010 lb, based on average fishery performance over the past three years at 194,598 lb (Table 4). However, if catches increase as seen in 2014 when the fishery caught 314,269 lb, NMFS would implement a federal fishery closure when fishery would reach or exceed the ACT to prevent the ACL from being exceeded. If the fishery exceeds the ACL, then based on the most recent three-year average an overage adjustment would be applied to the following year.

2.2.3 *Alternative 3: Specify ACL at P*=41 percent and ACT at P*=36 percent based on P* and SEEM analysis with both in-season and post-season AMs (Nadon 2024)*

Under Alternative 3, the Council may recommend specification of ACLs for the MHI uku fishery based on the results of the 2024 benchmark stock assessment and associated P* and SEEM analyses for fishing years 2026 through 2029 at 41 percent risk of overfishing. This alternative would also utilize the results of the uku P* and SEEM analyses taking into consideration the management and monitoring uncertainty to equate to a score of five to specify the ACL at 406,532 (P*=41 percent) and set an ACT at 401,020 lb (P*=36 percent).

In-season and post-season AMs under Alternative 3 would operate as described for Alternative 2, with a higher ACT and ACL based on the results of the 2024 stock assessment update (Nadon 2024). The ACLs and ACTs proposed for Alternative 3 would be a substantial increase while maintaining the same risk of overfishing relative to Alternative 2. Compared to Alternative 2, Alternative 3 is consistent with all requirements of the Magnuson-Stevens Act, the Hawaii FEP, and implementing regulations.

Expected Fishery Outcome

Under Alternative 3, the fishery could catch up to 406,532 lb of uku, which is 111,113 lb more than the ACL for fishing years from 2022 through 2025. Using the information from the assessment update resulted in higher allowable catch levels compared to the previous assessment. However, the fishery is not likely to reach the ACLs if the fishery performance is similar to fishery performance over the past 10 years. Over the past decade, the fishery has not exceeded MSY values and participation in the fishery has steadily declined. If the fishery performs close to the highest recent catch of about 314,269 lb during the 2014 fishing year, the fishery would remain open throughout each of the next three years.

Because State and Federal laws require fishermen to report on a per trip basis, management uncertainty (i.e., associated with late reporting) is unlikely to cause the fishery to exceed the proposed ACL of 406,532 lb and ACT of 401,020 lb.

2.2.4 *Alternative 4: Specify an ACL at P*=36 percent equivalent to 181.9.5 mt (401,020 lb) based on the P* and SEEM analysis with post-season AM (Nadon 2024)*

Under Alternative 4, the Council may recommend specification of ACLs for the MHI uku fishery based on the results of the 2024 benchmark stock assessment and associated P* and SEEM analyses and specify ACL at 36 percent risk of overfishing associated at 181.9 mt (401,020 lb) for

fishing years 2026 through 2029. The Council would also recommend specification of a post-season AMs described in Alternatives 2 and 3. However, Alternative 4 would not specify ACTs and in-season monitoring due to the high uncertainty with non-commercial catch estimates derived from HMRFS conducted by the State of Hawaii and MRIP. Although the monitoring and management uncertainty are accounted for within the specification of an ACT to allow for a buffer from the ACL, the application management and monitoring uncertainty would be applied to the ACL specification similar to the MHI Deep 7 bottomfish fishery and the American Samoa bottomfish fishery.

Expected Fishery Outcome

Under Alternative 4, the fishery could catch up to 401,020 lb of uku, which is 105,601 lb more than the ACL for fishing years from 2022 through 2025. However, the ACL under Alternative 4 is 5,512 lb less than Alternative 3. Using the information from the assessment update resulted in higher allowable catch levels compared to the previous assessment. However, the fishery is not likely to reach the ACLs if the fishery performance is similar to fishery performance over the past 10 years. Over the past decade, the fishery has not exceeded MSY values and participation in the fishery has steadily declined. If the fishery performs close to the highest recent catch of about 314,269 lb during the 2014 fishing year, the fishery would remain open throughout each of the next three years.

Implementation of an in-season AM for both commercial and non-commercial fisheries has been challenging in Hawai‘i uku fisheries. These challenges are primarily related to the use of in-season non-commercial catch estimates, which have high uncertainty and are only available with significant time delay. In 2022, in-season estimates using both commercial and non-commercial catch estimates were unable to correctly project when the ACT was exceeded; although the ACL was not exceeded in this case, it highlights that available in-season data may not be certain or timely enough to support in-season management.

The National Academy of Science, Engineering, and Medicine (NASEM) conducted an independent study on Data and Management Strategies for Recreational Fisheries with Annual Catch Limits (NASEM 2021). Based on the results of the study, NASEM clarified that MRIP catch estimate method was developed to generate estimates of recreational (non-commercial) fisheries catch and effort that best suited for post-season assessment and management and was not intended or designed to support in-season monitoring. Consistent with the NASEM findings, the main products of the HMRFS-MRIP analysis are bi-monthly non-commercial catch estimates that have high uncertainty. In addition, the bi-monthly estimates are not available until about 45 days after the data are collected, limiting their applicability to in-season monitoring.

The high uncertainty and time delay in non-commercial catch estimates means that an AM based on them will also be highly uncertain. As seen in 2022, this could result in a failure to implement the AM when it is appropriate, but it could also result in the inappropriate application of an AM and closure of the fishery before the ACT is reached. For this reason, the Council should consider if an in-season AM should be applied for MHI uku in 2026-2029.

Because State and Federal laws require fishermen to report on a per trip basis, management uncertainty (i.e., associated with late reporting) is unlikely to cause the fishery to exceed the proposed ACL of 419,980 lb.

2.2.5 *Alternative 5: Specify ACL and ACT lower than P * and SEEM analysis with both in-season and post-season AMs (Nadon 2024)*

Under Alternative 5, the Council may recommend specifying an ACL lower than the 2020 P* and SEE analysis for the 2026 to 2029 fishing years. Catch limit options under this Alternative are 2-10 percent lower than the ACLs indicated by the results of the P* and SEEM analysis (Table 7). This option would also utilize the results of the uku P* and SEEM analyses taking into consideration the management and monitoring uncertainty to further reduce the ACL by 5 percent to set an ACT as noted in Table 7.

Table 7. Possible ACLs and ACTs based on percent reductions from the probability of overfishing as determined by the P* and SEEM analyses for uku. ACLs are expressed in lb The number in the parentheses represent probability of overfishing, or P*.

Option	ACL	ACT
ACL at P* and SEE	406,532 (41)	401,020 (36)
ACL at P* and SEE -2 percent	404,327 (39)	398,816 (34)
ACL at P* and SEE -5 percent	201,020 (35)	395,509 (31)
ACL at P* and SEE -8 percent	397,713 (33)	391,981 (28)
ACL at P* and SEE -10 percent	395,509 (31)	389,556 (26)

In-season and post-season AMs under Alternative 5 would operate as described for Alternative 3, with a lower ACL and ACT based on the results of the 2024 stock assessment update (Nadon 2024). This Alternative provides a more conservative approach to account for scientific and management uncertainties not identified in the P* and SEEM analyses.

Expected Fishery Outcome

Under Alternative 5, the allowable catch would depend on the ACL below P* and SEEM selected by the Council. Using the information from the assessment update resulted in higher allowable catch levels compared to the previous assessment. However, the fishery is not likely to reach the ACLs if the fishery performance is similar to fishery performance over the past 10 years. Over the past decade, the fishery has not exceeded MSY values and participation in the fishery has steadily declined. If the fishery performs close to the highest recent catch of about 314,269 lb during the 2014 fishing year, the fishery would remain open throughout each of the next three years.

Compared to Alternative 3, this is a more conservative approach to setting catch limits and would lower the allowable amount of catch available to the fishing community for uku.

2.2.6 *Alternative 6: Specify an ACL lower than the P* and SEEM analysis with post-season AM (Nadon 2024)*

Under Alternative 6, the Council will recommend specifying an ACL lower than 2020 P* and SEEM analysis for the 2026 through 2029 fishing years. Catch limit options under this Alternative are 2 to 10 percent lower than the ACLs indicated by the results of the P* and SEEM

analysis (Table 8). This would cover additional uncertainties due to the large variability in the non-commercial catch estimates from the HMRFS. A larger buffer between the ACL and ABC would provide an additional measure that the ACL will not be exceeded. Similar to Alternative 5, this option is more precautionary than Alternatives 3 or 4.

Table 8. Possible ACLs based on percent reductions from the probability of overfishing as determined by P* and SEEM analyses. ACLs are expressed in lb. The number in the parentheses represents P*.

Option	ACL
ACL at P* and SEEM	401,020 (36)
ACL at P* and SEEM -2 percent	398,816 (34)
ACL at P* and SEEM -5 percent	395,509 (31)
ACL at P* and SEEM -8 percent	391,981 (28)
ACL at P* and SEEM -10 percent	389,556 (26)

Expected Fishery Outcome

Under Alternative 6, the allowable catch would depend on the ACL below P* and SEEM selected by the Council. Using the information from the assessment update resulted in higher allowable catch levels compared to the previous assessment. However, the fishery is not likely to reach the ACL even at levels below 408,516 lb if the fishery performance is similar to fishery performance over the past 10 years. The average catch from 2021 to 2023 was about 247,381 lb (Table 4). If the fishery performs close to the highest recent catch of about 314,269 lb during the 2014 fishing year, the fishery would remain open throughout each of the next three years.

Compared to Alternative 4, this is a more conservative approach to setting catch limits and would lower the allowable amount of catch available to the fishing community for uku.

3 Description of the Affected Environment

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

3.1 Overview of the Uku Fishery

Information about the Hawaii commercial uku fishery is summarized from the previous EAs for uku (NMFS 2020, NMFS 2022a) and supplemented by more recent information and summaries from ongoing management actions. Alternatives considered in this EA include considerations for non-commercial fisheries, and thus, this overview also considers the non-commercial fishery sector. In Hawai‘i, uku are highly regarded for their firm and flavorful white flesh that is good for either cooking or raw consumption, similar to ‘ōpakapaka, onaga, and other Deep-7 bottomfish. However, residents of Hawai‘i do not typically use uku to fill seasonal demand for whole fish during the holiday season due to consumer preference for red color. Rather, Hawaiian hotel and

restaurant industries primarily drive the commercial uku fishery, taking advantage of the species as a low-price alternative to Deep-7 bottomfish (WPFMC 2024). Because of the wide habitat range where uku is found, it is commonly harvested using handline tackle and troll gear (WPFMC 2024), with the majority of reported catch taken by handline (**Error! Reference source not found.**), which is also the primary gear type used to catch Deep 7 bottomfish in the MHI (e.g., onaga and ʻōpakapaka).

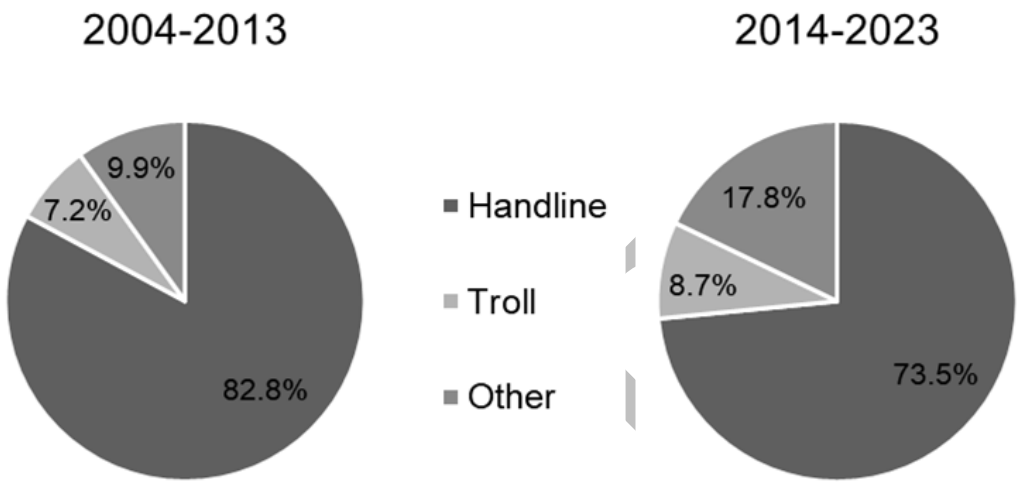

Figure 3. Proportion of gear types utilized that commercially harvested uku in the Main Hawaiian Islands from the 10-year periods 2004 to 2013 and 2014 to 2023
Note: "Other" includes hook-and-line, casting, as well as all other gear types.

When using handlines, fishers employ a vertical hook-and-line method of fishing in which weighted and baited lines are lowered and raised with electric- or hydraulic-powered reels to the desired fishing depth to target particular species (i.e., "handline"). The main line is typically constructed of dacron or 400 to 450-pound test monofilament with hook leaders of 80- to 120-pound test monofilament. The hooks are circle hooks, generally of the Mustad (conventional scale) sizes 11/0, 12/0, and 13/0, and a typical configuration uses six to eight hooks branching off of the main line. The weight is typically 5 to 6 lb. The hook leaders are usually 2 to 3 feet long and separated by about 6 feet along the main line. Squid is frequently used as bait, but hooks may also be baited with fish such as aku (*Katsuwonis pelamis*) or bigeye scad (*Selar crumenopthalmus*). Some fishers may also suspend a chum bag containing chopped fish or squid above the highest hook to attract fish.

Defining the MHI uku fishery by gear type is difficult, especially in recent years, due to the species being found in a wide range of depths and habitat types. Fishers catch uku both intentionally and incidentally using a wide range of gears, including deep-sea and inshore handline, trolling, shore-based casting, and spearfishing, among others (WPFMC 2024). Historically, the deep-sea handline gear type has dominated commercial uku catch; however, since the late 1970s, proportional commercial catches of uku using deep-sea handline gear has decreased as other gears become more commonly reported (see Figure 3). The purported transition away from deep-sea handle by commercial fishers harvesting uku may be indicative of a shift to direct targeting with unique gears and/or techniques intended to specifically harvest the species. In some cases, these fishers targeting uku specifically choose to report their catch using

gear types apart from those reported most frequently in the past. Some fishers redefined their deep-sea handline gear as inshore handline to reflect lighter gear weight, while others disregarded the handline designation entirely and report instead with other gears such as casting. In 2023, MHI uku were caught primarily with the deep-sea handline (66 percent), with inshore handline (8 percent), trolling with bait (6 percent), and other gears (19 percent) contributing smaller proportions of the total landings (WPFMC 2024).

The typical vessel in the commercial MHI bottomfish fleet is made of fiberglass and measures approximately 23 ft long, although there are a few larger full-time commercial vessels in the fishery (Chan and Pan 2017). Specific bottomfish fishing locations favored by fishermen in the MHI vary seasonally according to sea conditions and the availability and price of target species. The fishery is spread across the MHI, though heavily concentrated in certain areas, specifically Penguin Bank, which typically contributes about 36 percent of landings (WPFMC 2024). A 2014 survey of commercial and non-commercial bottomfish fishermen indicates that the majority of MHI bottomfish fishing trips (56 percent) are limited to state waters, with the balance in the EEZ (Chan and Pan 2017). This is similar to the result of a previous study (Hospital and Beavers 2012), which found that 66 percent of bottomfish trips are limited to State waters only. Commercial fishing in State waters over the past 20 years has contributed about 36 percent of the total reported catch (WPFMC 2024).

Penguin Bank is particularly important for the MHI catch of uku, one of the few bottomfish species available in substantial quantities to Hawaii consumers during summer months (NMFS 2022a). Uku catch typically peaks around May of each year driven by commercial targeting via single-day trips on Penguin Bank, and many commercial fishers view uku as a seasonal component of the Deep-7 bottomfish fishery (WPFMC 2024). The high season for MHI from April to June declines as the yellowfin tuna (*Thunnus albacares*, or ahi) season begins and fishers shift to targeting the more valued tuna species (**Error! Reference source not found.**). Uku landings generally remain low throughout the rest of the fishing season.

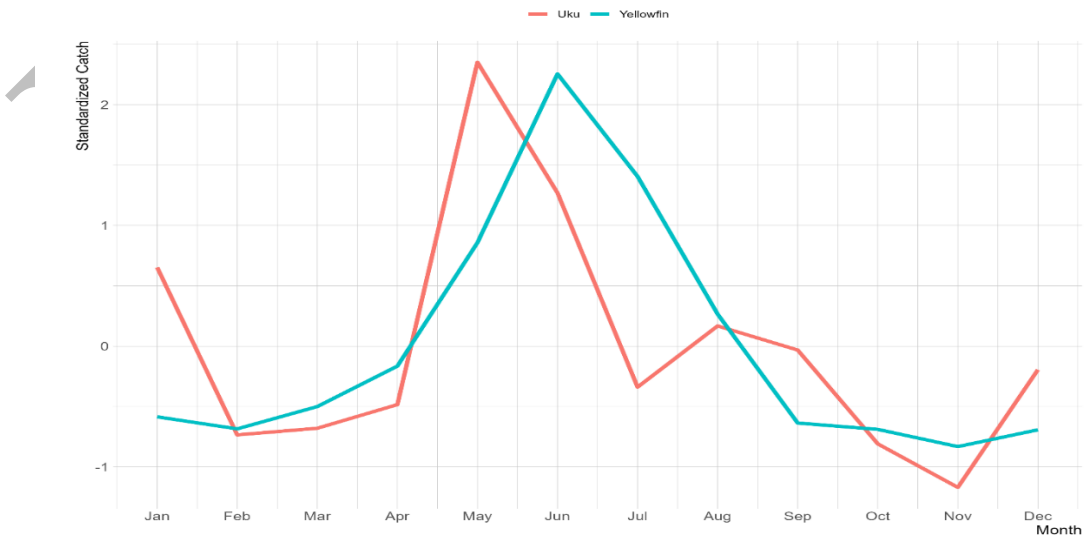

Figure 4. Standardized monthly commercial catches of uku (red) and ahi (blue) from 2014 to 2024.

NMFS first incorporated considerations for the non-commercial fishery sector for MHI uku in the 2022 EA (NMFS 2022a). Estimates for non-commercial fishery parameters are considered based on location, i.e., boat-based fishing in State waters (≤ 3 miles offshore), boat-based fishing in Federal waters (>3 miles offshore) and shore-based fishing in State waters. Recent NOAA MRIP data show that the majority of MHI uku catch occurs in State waters. But proportional catches from Federal waters are relatively higher than overall effort in State waters. Over the past 6 years, approximately 90 percent of MRIP-estimated angler trips in Hawaii occurred in State waters. This is contrasted by estimated uku catches over the same period, of which only 83 percent came from State waters (Figure 5). MRIP non-commercial effort estimates may include fishing effort from which catch was sold. Unlike commercial effort, which is estimated using vessel trips as the primary unit, non-commercial effort estimates as presented as fishing trips of individual anglers by day regardless of the number of hours fished.[2] In the most recent stock assessments (Nadon et al. 2020, Nadon 2024), NMFS corrected non-commercial catch estimates to remove sold catch. Non-commercial fishing methods include all the methods used in the commercial fishery sector with a greater emphasis on shore-based hook and line fishing in State waters. A review of all non-commercial fisheries in Hawaii (Torres and Ma 2020) focusing on the fishery in 2017 estimated that less than 1 percent of non-commercial angler trips focused on snappers, including uku.

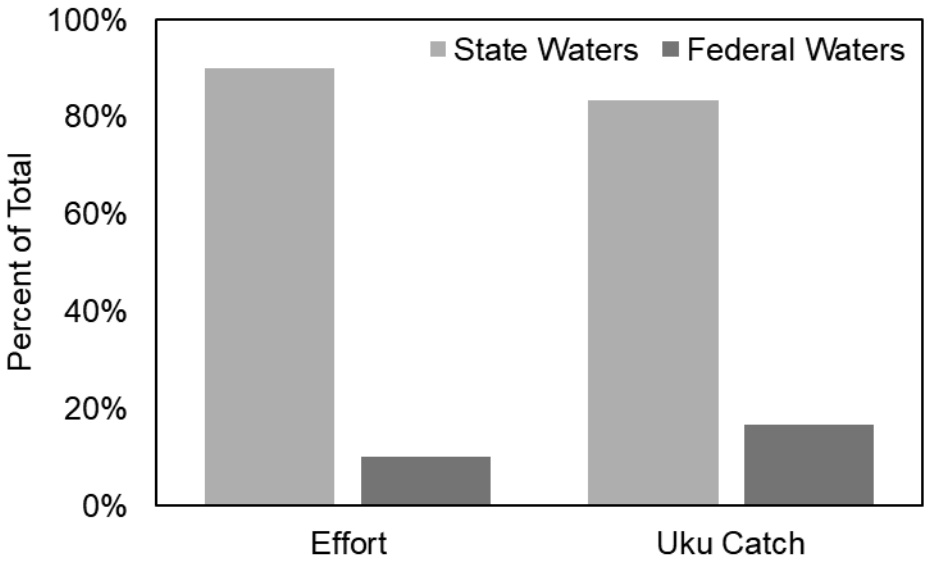

Figure 5. Proportion of overall MRIP effort and estimated uku catch in State and Federal waters around the Main Hawaiian Islands from 2018 to 2023
Source: NMFS MRIP website, accessed 4/7/2025.
Note: Data from 1981-2017 contain estimates resulting from the full application of both the Access Point Angler Intercept Survey (APAIS) and Fishing Effort Survey (FES) calibration. Only data from 2018 to 2023 are shown because they are derived solely from the FES.

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

The proportion of bycatch to harvests of the target species in the commercial uku fishery is typically low (i.e., less than 2 percent), as the only regulation limiting commercial catch is a one-pound minimum size for spearfishing and commercial sale (WPFMC 2024). However, the proportion of bycatch in the fishery has been steadily increasing over the past two decades, possibly due to the increasing use of inshore handline over time; from 2014 to 2023, inshore handline gear landed approximately 15 percent of the total uku catch yet contributed roughly half of all releases (WPFMC 2024). The proportion of bycatch for the MHI uku fishery in 2023 was below its 10- and 20-year averages. Relative to other fishery species targeted with similar gear types, fishers generally retain uku at a slightly higher rate, likely due to common bycatch species (e.g., kahala, sharks) being caught by those gears (WPFMC 2024).

3.2 Overview of Bottomfish Biology and Distribution

General information regarding the biology and habitat of uku is described in Amendment 4 to the FEP (WPFMC 2016). Uku is in the subfamily Etelinae and is the only species in its genus. Uku are widely distributed throughout the Indian and Pacific oceans from East Africa to Hawai‘i (Druzhinin 1970, Tinker 1978). Ralston (1979) reported it spawns during the summer months while its spawning season has been reported elsewhere as being from May to October (Everson et al. 1989). The maximum length for the species is 110 cm (Randall 2007) and the Hawai‘i state record with respect to catch weight is 39.5 lb.[3]

Uku reach sexual maturity at an age of 4 to 5 years and approximately 42.5 to 47.5 cm standard length (Everson et al. 1989, Grimes 1987). Egg and larval development in this species are not well known. Leis and Lee (1994) described identifying characteristics of their larvae which appear to be more similar to *Etelis* than *Aphareus* or *Pristipomoides* larvae. This species lacks a melanophore cluster on the dorsal side of the tail but has a distal melanophore or several in series on the second dorsal spine. Larvae are confirmed to be pelagic to at least 18 mm notochord length and may in fact settle before it reaches 20 mm (Leis and Lee 1994). While early life history information for uku is scarce, larval and juvenile uku have most commonly been observed in the summer, likely coupled with the peak of adult spawning in June, and rarely deeper than 40 m (Schmidt et al. 2023). Meyer et al. (2007) observed that uku movement patterns were generally similar to those previously described for other coral reef fishes, which is associated with a strong diel rhythmicity. This diel rhythm in uku movement may indicate changing between foraging and refuge habitats.

In the Hawai‘i Archipelago, most bottomfish species are caught along the steep drop-offs and slopes that surround the islands and banks (Ralston and Polovina 1982). Uku, however, is different in that it is primarily caught on the tops, not the sides or slopes, of these banks, and it can also be caught at or near the surface with a lure (Meyer et al. 2007). The adult habitat of uku includes the open waters of deep lagoons, channels, or seaward reefs at depths of 0 to 180 m, where individuals or small aggregations are most often observed (Haight 1989, Lieske and Myers 1994). In Guam, uku are found along the outer reef slopes, in deep channels and in shallow lagoons at depths of 3 to 180 m (Amesbury and Myers 1982). Uku have been reported to be as deep as 274 m (Druzhinin 1970) but are reportedly also abundant in shallow water over coral

[3] http://www.hawaiifishingnews.com/records.cfm.

reefs (Talbot 1960). In the waters around the Hawaiian Islands, the official deepest recorded uku occurrence was 227 m (UH unpublished data 2010, WPFMC 2016).

3.3 Affected Physical Resources

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

3.4 Target and Non-Target Fish Species

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

While fishermen occasionally catch uku as a non-target species during Deep 7 bottomfish fishing operations, it is more typically caught as a target species using similar gear. Fishermen also target uku when fishing for Deep 7 bottomfish is unfavorable due to weather or prohibited due to attainment of the Deep 7 bottomfish ACL. **Error! Reference source not found.** compares catch of uku from 2015–2023 with opakapaka, onaga and ehu, the three principal species in the Deep 7 complex. This period covers recent years when ACLs were implemented for both stocks and the Deep 7 fishery did not close due to reaching the ACL. Uku catch during this period was smaller, though similar in magnitude to opakapaka catch, approximately double onaga catch and five times greater than ehu catch.

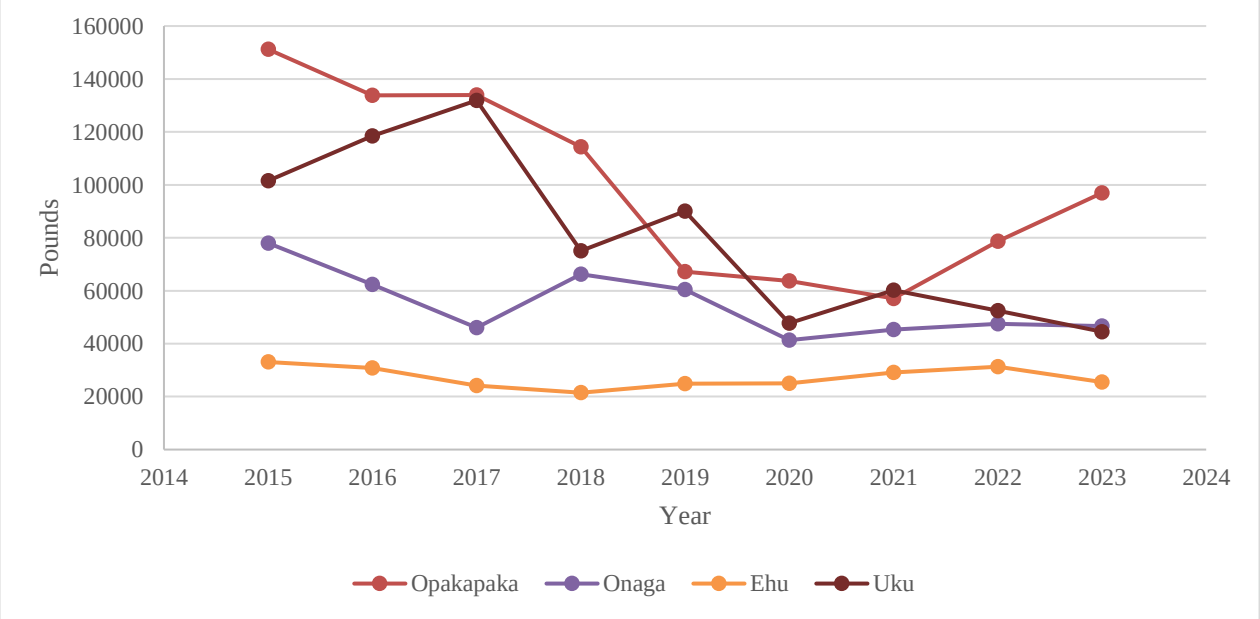

Figure 6. Commercial catch of uku, ehu, onaga and opakapaka from 2015–2023.
Source: WPacFIN website.

3.5 Target Fish Species – Uku

General background information on uku comes from Amendment 4 of the Hawaii FEP (WPFMC 2016). Uku is in the family Lutjanidae, subfamily Etelinae, and is the only species in its genus. This species is widely distributed throughout the Indian and Pacific oceans from East Africa to Hawaii (Druzhinin 1970, Tinker 1978). Uku reach sexual maturity at an age of 4–5 years and approximately 42.5–47.5 cm in Hawaii (Everson et al. 1989; Grimes, 1987). Ralston (1979) reported that uku spawns during the summer months. The maximum length is 110 cm (Randall 2007). Haight (1989) reported that uku feed during daytime hours and found the diet of specimens collected from Penguin Bank in the MHI to include fish (89 percent), larval fish (6 percent), planktonic crustaceans (1 percent), shrimp (3 percent) and crabs (1 percent). Unlike the benthic species of deepwater lutjanids, uku has feeding habits that do not seem to be constrained by substrate association (Parrish 1987). This species forages throughout the water column (Ralston 1979; Parrish 1987), from the surface down to almost 200 m.

Stock Status for MHI uku

The 2024 stock assessment (Nadon 2024) suggests that spawning stock biomass at the minimum stock size threshold (SSB_{MSST}) is 868,620 lb (394 mt), and the spawning stock biomass in the most recent year in the assessment (2023) is 2,193,597 lb (995 mt) or 2.5 times the SSB_{MSST}. The 2024 assessment estimated the OFL for uku to be 418,437 lb (189.8 mt), and total catches since 2012 have remained below this level (**Error! Reference source not found.**). As such, the assessment determined that overfishing was not occurring for uku, it was not overfished, and that the population was likely stable with regard to size composition.

3.6 Non-Target Fish Species - Bycatch

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

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

Bycatch information is not readily available from the MHI commercial uku bottomfish fishery. However, bycatch in the broader MHI bottomfish fishery (including Deep 7 and non-Deep 7 bottomfish) was studied by Kawamoto and Gonzales (2005). This study showed that bottomfish fishing is relatively target-specific, and that the bycatch rate is relatively low. Approximately 8.5 percent of the catch was reported as not retained because it was either lost or deliberately discarded (Kawamoto and Gonzales 2005). The majority of the bycatch is composed of several jacks that are now classified as ecosystem component species (ECS) (e.g., kahala, butaguchi, and

white ulua). Other than these data, there is no recent bycatch information for the commercial MHI bottomfish fishery. Bycatch in the non-commercial fishery is also unknown. As the same gears are used in the non-commercial fishery, we assume that bycatch rate is also relatively low.

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

3.7 Protected Species

A number of protected species are documented as occurring in the waters around the Hawaiian Islands including sea turtles, marine mammals, and seabirds that, at least potentially, could interact with the MHI uku fishery. This fishery has been evaluated for impacts on protected resources and is managed in compliance with the requirements of the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), and the Migratory Bird Treaty Act.

3.7.1 Species protected under the Endangered Species Act (ESA)

Table 9 lists endangered or threatened species occurring around Hawaii including five sea turtles, the Hawaiian monk seal, five whales, four seabirds, and two fishes.

Table 9. Endangered and threatened marine species and seabirds with the potential to interact with the MHI uku fishery

Common name (*Scientific name*)	ESA listing status in Hawaii	Occurrence in Hawaii
Listed Sea Turtles		
Green sea turtle (*Chelonia mydas*)	Threatened Distinct Population Segment (DPS) in Hawaii	Most common turtle in the Hawaiian Islands. Most nesting occurs in the northwestern Hawaiian Islands. Foraging and hauling out in the MHI.
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered	Small population foraging around Hawaii and low level nesting on Maui and Hawaii Islands.
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	No nesting or foraging grounds in Hawaii. Rarely sighted while traveling between nesting and foraging habitats.
Olive riddle sea turtle (*Lepidochelys olivacea*)	Threatened	No nesting or foraging grounds in Hawaii. Infrequently sighted while traveling between nesting and foraging habitats.

Common name (*Scientific name*)	ESA listing status in Hawaii	Occurrence in Hawaii
North Pacific loggerhead (*Caretta caretta*)	Endangered DPS in Hawaii	No nesting or foraging grounds in Hawaii. Infrequently sighted while traveling between nesting and foraging habitats.
Listed Marine Mammals		
Hawaiian monk seal (*Neomonachus schauinslandi*)	Endangered	Endemic tropical seal. Occurs throughout the archipelago. Population trend uncertain; no mortality or serious injuries attributed to MHI bottomfish fishery (Carretta, et al. 2017).
Blue whale (*Balaenoptera musculus*)	Endangered	No sightings or strandings reported in Hawaii but acoustically recorded off Oahu and Midway Atoll. No record of interactions with the MHI Bottomfish Fishery.
Fin whale (*B. physalus*)	Endangered	Infrequent sightings in Hawaii waters.
Sei whale (*B. borealis*)	Endangered	Worldwide distribution. Primarily found in cold temperate to subpolar latitudes. Rare in Hawaii.
Sperm whale (*Physeter macrocephalus*)	Endangered	Found in tropical to polar waters worldwide. Sighted off the NWHI and the MHI.
MHI insular false killer whale (*Pseudorca crassidens*)	Endangered DPS in Hawaii	Found in waters within 140 km (60 nm) of the MHI.
Listed Sea Birds		
Newell's shearwater (*Puffinus auricularis newelli*)	Threatened	Rare. Breeds only in colonies on the MHI where it is threatened by predators and urban development.

Common name (*Scientific name*)	ESA listing status in Hawaii	Occurrence in Hawaii
Hawaiian petrel (*Pterodroma phaeopygia*)	Endangered	Rare.
Band-rumped storm-petrel (*Oceanodroma castro*)	Endangered DPS in Hawaii	Rare.
Short-tailed albatross (*Phoebastria albatrus*)	Endangered	Nest in small numbers on Midway Atoll in the NWHI.
Listed Fish		
Giant manta ray (*Manta birostris*)	Threatened	Found worldwide in tropical, subtropical, and temperate bodies of water and is commonly found offshore, in oceanic waters, and near productive coastlines.
Oceanic whitetip shark (*Carcharhinus longimanus*)	Threatened	Found worldwide in tropical and sub-tropical waters. They live from the surface of the water to at least 498 feet deep.
Critical Habitat		
Monk seal critical habitat	Endangered	Includes the seafloor and marine habitat to 10 m above the seafloor from the 200 m depth contour through the shoreline, and extending into terrestrial habitat 5 m inland from the shoreline between identified boundary points around all islands in the MHI*.
Insular False killer whale critical habitat	Endangered DPS in Hawaii	Extends from the 45-m depth contour to the 3,200-m depth contour around the MHI from Niihau east to Hawaii.

Source: NOAA Fisheries endangered species website, accessed April 8, 2025.

Applicable ESA Consultations – Hawaii Bottomfish fisheries

In a biological opinion (BiOp) covering MHI bottomfish fisheries, including uku[4], dated March 18, 2008, NMFS evaluated the impact of these fisheries on blue, fin, sei, and sperm whales;

[4] The 2008 BiOp analyzed effects of new management measures for bottomfish fishing in the MHI, including licensing and catch reporting for all bottomfish management unit species (BMUS - Deep 7, uku and several other

green, loggerhead, olive ridley, hawksbill, and leatherback sea turtles; and Hawaiian monk seals. NMFS determined that, except for the Hawaiian green sea turtle, bottomfish fishing activities are not likely to adversely affect any other ESA-listed marine species found in Federal waters of the MHI, or result in the destruction or adverse modification of critical habitat (NMFS 2008).

For green sea turtles, NMFS determined that there is a potential for them to be killed by vessels transiting state waters on route to and from Federal waters around the MHI, and authorized an incidental take of up to two green sea turtles per year. However, this analysis used an estimated 71,800 bottomfish fishing trips per year (NMFS 2008). The total annual numbers of commercial non-Deep 7 bottomfish fishing trips and reports since the 2008 BiOp have been less than 2,400 per year (Table 16). Uku is the primary targeted non-Deep 7 species, so non-Deep 7 trips may be considered a reasonable proxy for the number of uku fishing trips. Therefore, the potential for collisions with bottomfish vessels is substantially lower than estimated in the 2008 BiOp considering the MHI uku fishery. Even with the assumption of a relatively high number of fishing trips, the BiOp concluded that the MHI bottomfish fishery is not likely to jeopardize the existence of green sea turtles.

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

NMFS has determined that since completion of the 2008 BiOp, there has been no new information to suggest that the MHI bottomfish fisheries interact with the species considered in that consultation (blue, fin, sei, and sperm whales; green, loggerhead, olive ridley, hawksbill, and leatherback sea turtles; and Hawaiian monk seals) in a manner or to an extent not previously considered in that consultation. Thus, the conclusions of the 2008 BiOp remain valid with respect to these species.

In 2013, NMFS re-initiated consultation under ESA in response to listing the MHI insular false killer whale distinct population segment under the ESA. In a modification to the 2008 BiOp dated August 7, 2013, NMFS determined that commercial and non-commercial bottomfish fisheries in the MHI may affect, but are not likely to adversely affect MHI insular false killer whales (NMFS 2013). 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 NWHI and six in the MHI (NMFS 2014). These areas contain one or a combination of habitat types: preferred pupping and nursing areas,

species) and a total allowable catch for Deep 7 bottomfish. Due to similarity in fishing methods for BMUS, fishing for all these species was covered in this analysis as bottomfish fishing.

significant haul-out areas, and/or marine foraging areas, that will support conservation for the species. Specific areas in the MHI include marine habitat from the 200 m depth contour line, including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor, through the water's edge 5 m into the terrestrial environment from the shoreline between identified boundary points on the islands of: Kaula, Niihau, Kauai, Oahu, Maui Nui (including Kahoolawe, Lanai, Maui, and Molokai), and Hawaii. In areas where critical habitat does not extend inland, the designation ends at the mean lower low water line.

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

- there exists spatial separation between the fishery and monk seal haul-out, pupping and nursing areas
- removal of bottomfish species by the fishery will not have a discernable overall effect on monk seal forage items
- fishing gear is unlikely to cause discernable changes to bottom structure.

On July 24, 2018, NMFS designated critical habitat for insular false killer whales (IFKW) from the 45-m depth contour to the 3,200-m depth contour around the MHI from Niihau east to Hawaii (83 FR 35062). This area encompasses the geographic and depth ranges of the bottomfish fishery in the MHI. Under the Magnuson-Stevens Act, prey species are also considered to be part of critical habitat. Though three carangid non-Deep 7 bottomfish species (kahala, white ulua, and black ulua) have been described as IFKW prey species, uku has not (NMFS 2018). Also, in its biological report for the designation of IFKW critical habitat, NMFS concluded that "because these prey species represent an insignificant fraction of total bottomfish fishery harvests, adverse impacts to MHI IFKW critical habitat are not expected" (NMFS 2018) and determined that the proposed action may affect, but is not likely to adversely modify MHI IFKW DPS critical habitat (NMFS 2019). On August 26, 2022, NMFS published a BiOp (NMFS 2022b) concluding that MHI bottomfish fisheries may affect, but were not likely to adversely affect IFKW critical habitat.

On January 30, 2018, NMFS published a final rule listing oceanic whitetip sharks as threatened species under the ESA (83 FR 4153).

Based on commercial and non-commercial logbooks and voluntary reports, Hawaii bottomfish fishermen have documented interactions with oceanic whitetip sharks; however, interactions have been infrequent and there are questions about species identification. NMFS determined (NMFS 2022b) that MHI bottomfish fisheries, including the uku fishery, are likely to adversely affect, but do not jeopardize the continued survival of, oceanic whitetip shark and provided an incidental take statement of two interactions and one mortality over five years. There have been no documented takes of oceanic whitetip in MHI bottomfish fisheries since 2022.

On January 22, 2018, NMFS published a final rule listing giant manta rays as threatened species under the ESA (83 FR 2916). NMFS determined (NMFS 2022b) that MHI bottomfish fisheries, including the uku fishery, may affect, but are not likely to adversely affect giant manta rays.

3.7.2 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 10 provides a list of non-ESA listed marine mammals known to or reasonably expected to occur in waters around the Hawaiian Archipelago that have the potential to interact with MHI bottomfish fisheries.

The commercial and non-commercial bottomfish fisheries in the MHI are not known to have adverse effects on non-ESA listed marine mammals (Table 10). Although all species occur in the EEZ where the fisheries operate, the only interactions documented between these fisheries and the marine mammals listed in Table 10 are some recorded observations of bottlenose dolphins (*Tursiops truncatus*) stealing fish from bottomfish fishing lines near Hawaii and Kaula Island (Nitta and Henderson 1993). A rate of 2.67 dolphin-damaged fish per 1,000 was observed in the NWHI bottomfish fishery by NMFS observers between 1990 and 1993 (Kobayashi and Kawamoto 1995). The impact of the bottomfish fishery on the behavior or foraging success of bottlenose dolphins is unknown, but is not known to be adverse. The other species listed in Table 10 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 10. Non-ESA-listed marine mammals occurring in waters around the MHI

Common Name	Scientific Name	Interactions with MHI bottomfish fishery
Blainville's beaked whale	*Mesoplodon densirostris*	No interactions observed or reported.
Bottlenose dolphin	*Tursiops truncatus*	Some interactions observed or reported.
Bryde's whale	*Balaenoptera edeni*	No interactions observed or reported.
Common dolphin	*Delphinus delphis*	No interactions observed or reported.
Cuvier's beaked whale	*Ziphius cavirostris*	No interactions observed or reported.
Dall's porpoise	*Phocoenoides dalli*	No interactions observed or reported.
Dwarf sperm whale	*Kogia sima*	No interactions observed or reported.
False killer whale (other than MHI Insular DPS)	*Pseudorca crassidens*	No interactions observed or reported.
Fraser's dolphin	*Lagenodelphis hosei*	No interactions observed or reported.
Humpback whale	*Megaptera novaeangliae*	No interactions observed or reported.
Killer whale	*Orcinus orca*	No interactions observed or reported.
Longman's beaked whale	*Indopacetus pacificus*	No interactions observed or reported.
Melon-headed whale	*Peponocephala electra*	No interactions observed or reported.

Common Name	Scientific Name	Interactions with MHI bottomfish fishery
Minke whale	*B. acutorostrata*	No interactions observed or reported.
Pantropical spotted dolphin	*Stenella attenuate*	No interactions observed or reported.
Pygmy killer whale	*Feresa attenuata*	No interactions observed or reported.
Pygmy sperm whale	*K. breviceps*	No interactions observed or reported.
Risso's dolphin	*Grampus griseus*	No interactions observed or reported.
Rough-toothed dolphin	*Steno bredanensis*	No interactions observed or reported.
Short-finned pilot whale	*Globicephala macrorhynchus*	No interactions observed or reported.
Spinner dolphin	*Stenella longirostris*	No interactions observed or reported.
Spotted dolphin	*Stenella attenuata*	No interactions observed or reported.
Striped dolphin	*Stenella coeruleoalba*	No interactions observed or reported.

Souce: WPFMC (2021).

Applicable MMPA Coordination – Hawaii Bottomfish Fisheries

The MMPA prohibits, with certain exceptions, taking of marine mammals in the U.S., and by persons aboard U.S. flagged vessels (i.e., persons and vessels subject to U.S. jurisdiction). Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries (LOF) that classifies U.S. commercial fisheries into one of three categories based upon the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. A Category I fishery is one with frequent incidental morality and serious injury of marine mammals. A Category II fishery is one with occasional incidental morality and serious injury of marine mammals. A Category III fishery is one with a remote likelihood or no known incidental morality and serious injury of marine mammals.

On February 16, 2024 (89 FR 12257), NMFS published the final LOF for 2024 which classified the Hawaii bottomfish handline fishery as a Category III fishery under Section 118 of the MMPA. Participants in Category III fisheries are not required to register in the Marine Mammal Authorization Program prior to engaging in commercial fishing. The proposed action does not change the conduct of the bottomfish fishery in any way and therefore will not introduce impacts not previously considered in prior MMPA determinations and the LOF classification.

3.7.3 Seabirds of the Hawaiian Archipelago

Seabirds forage in both State and Federal waters, but are not known, and are unlikely to interact with the MHI bottomfish fishery. Interactions with the bottomfish fishery are unlikely because of the methods used to deploy and retrieve fishing tackle. Bottomfish fishermen drop a weighted mainline vertically over the side of the vessel, and the hooks sink rapidly beyond the range of a diving seabird. Electric or hydraulic pullers retrieve lines rapidly. The time that bait is within the range of a diving seabird is limited, and the proximity of the vessel hull and fishermen to the bait

is a significant deterrent against seabirds becoming hooked. There have been no reports of interactions between the MHI bottomfish fishery and seabirds.

Table 11 lists all of the seabirds found on and around Hawaii that could potentially interact with fisheries. The short-tailed albatross, an endangered species, is a migratory seabird that nests in low numbers in the NWHI and has been seen flying over the waters around Hawaii. Other listed seabirds found in the region are the endangered Hawaiian petrel, the Band-rumped storm-petrel, and the threatened Newell's shearwater. Non-ESA-listed seabirds known to be present in Hawaii include the black-footed albatross, Laysan albatross, wedge-tailed, Audubon's, short-tailed and Christmas shearwaters, as well as the masked, brown, and red-footed boobies (or gannets), and a number of petrels and terns, frigate birds, and tropicbirds.

Table 11. Sea birds occurring in waters around the MHI. R= Resident/Breeding; V= Visitor/Migrant.

R/V	Common name	Scientific name
R	Hawaiian petrel	*Pterodroma phaeopygia* (ESA: Endangered)
R	Band-rumped storm-petrel	*Oceanodroma castro* (ESA: Endangered DPS)
R	Newell's shearwater	*Puffinus auricularis newelli* (ESA: Threatened)
V	Short-tailed albatross	*Phoebastria albatrus* (ESA: Endangered)
R	Black-footed albatross	*Ph. nigripes*
R	Laysan albatross	*Ph. immutabilis*
R	Wedge-tailed shearwater	*Puffinus pacificus*
V	Short-tailed shearwater	*Pu. tenuirostris*
R	Christmas shearwater	*Pu. nativitatis*
V	Leach's storm-petrel	*Oceanodroma leucorhoa*
R	Red-footed booby	*Sula sula*
R	Brown booby	*S. leucogaster*
R	Masked booby	*S. dactylatra*
R	White-tailed tropicbird	*Phaethon lepturus*
R	Red-tailed tropicbird	*Ph. rubricauda*
R	Great frigatebird	*Fregata minor*
R	Sooty tern	*Onychoprion fuscatus, formerly Sterna fuscata*
R	Brown noddy	*Anous stolidus pileatus*
R	Black noddy	*A. minutus melanogenys*
R	White tern / Common fairy-tern	*Gygis alba rothschildi*

Source: Pyle and Pyle (2017)

3.8 Habitats and Vulnerable Ecosystems

3.8.1 Essential Fish Habitat

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

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

In 2016, NMFS refined the Hawaii seamount groundfish EFH and HAPC by categorizing BMUS into three assemblages (i.e., Shallow, Intermediate, and Deep) and identifying EFH and HAPC for each group by life stage (WPFMC and NMFS 2016). Table 12 revisits the species listed in (WPFMC and NMFS 2016) and organizes the species which remain in the FEP as BMUS according to these assemblages.

Table 12. Depth assemblage for all Hawaii BMUS

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

The designated areas of EFH for bottomfish are summarized in Table 13. HAPC is the same for all life stages and is summarized in Table 14.

Table 13. EFH for MHI bottomfish

Assemblage	EFH (eggs)	EFH (post-hatch pelagic)	EFH (post-settlement)	EFH (sub-adult/adult)
Shallow	Pelagic zone of the water column in depths from the surface to 240 m, extending from the official US baseline to a line on which each point is 50 miles from the baseline	Same as eggs	Benthic or benthopelagic zones, including all bottom habitats, in depths from the surface to 240 m bounded by the official US baseline and 240 m isobath	Same as post-settlement
Intermediate	Pelagic zone of the water column in depths from the surface to 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*) extending from the official US baseline to a line on which each point is 50 miles from the baseline	Pelagic zone of the water column in depths from the surface 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*), extending from the officialU.S. baseline to the EEZ boundary	Benthic (*H. quernus* and *A. rutilans*) or benthopelagic (*A. rutilans* and *P. filamentosus)* zones, including all bottom habitats, in depths from the surface to 280 m (*A. rutilans* and *P. filamentosus*) or 320 m (*H. quernus*) bounded by the 40 m isobath and 100 m (*P. filamentosus),* 280 m (*A. rutilans*) or 320 m (*H. quernus*) isobaths	Same as post-settlement

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

Table 14. HAPC for all life stages of MHI bottomfish

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

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

NMFS and the Council have recently undertaken efforts to update the EFH designation for MHI uku. From July 12-14, 2022, the Council and NMFS convened a peer-review WPSAR process for recently developed Level 1, presence-absence, (Franklin 2021) and Level 2, density, (Tanaka et al. 2022) models to improve the delineation of uku EFH in the MHI (87 FR 38382, June 28, 2022). Neither study examined the occurrence or abundance of the egg, post-hatch pelagic, or post-settlement life stages of uku. Instead, both models focused on EFH for sub-adult and adult life stages of the species (WPFMC 2022).

The WPSAR process determined that both the presence-absence and density approach represented a great improvement over existing literature based descriptions of uku EFH (WPFMC 2005; WPFMC 2016; WPFMC 2022). At the 197th meeting in December 2023, the Council recommended, as final action, amending the Hawai‘i FEP to revise the EFH definitions for MHI sub-adult and adult uku by incorporating both density and presence-absence data (Figure 7) supplemented by a comprehensive literature review. The recommendation would not remove or add any EFH from the FEP that is not either already covered by uku or other FEP bottomfish species, however, it reflects a significant improvement in the EFH definition based on available data. These improvements include the ability to describe ecologically meaningful areas for which

mitigation of adverse impacts to uku and its habitats that could be prioritized during federal agency EFH consultations. These improvements include estimates of the top 25, 50, and 75 percent of model-predicted uku occurrence and density which can be interpreted as EFH hot spots, core EFH, and principle EFH, respectively. The defined EFH recommended by the Council includes 95 percent of the predicted uku occurrence under the both the occurrence and density models (Figure 7). However, at the time of publication of this EA, rulemaking to implement the revised EFH designation is not yet complete.

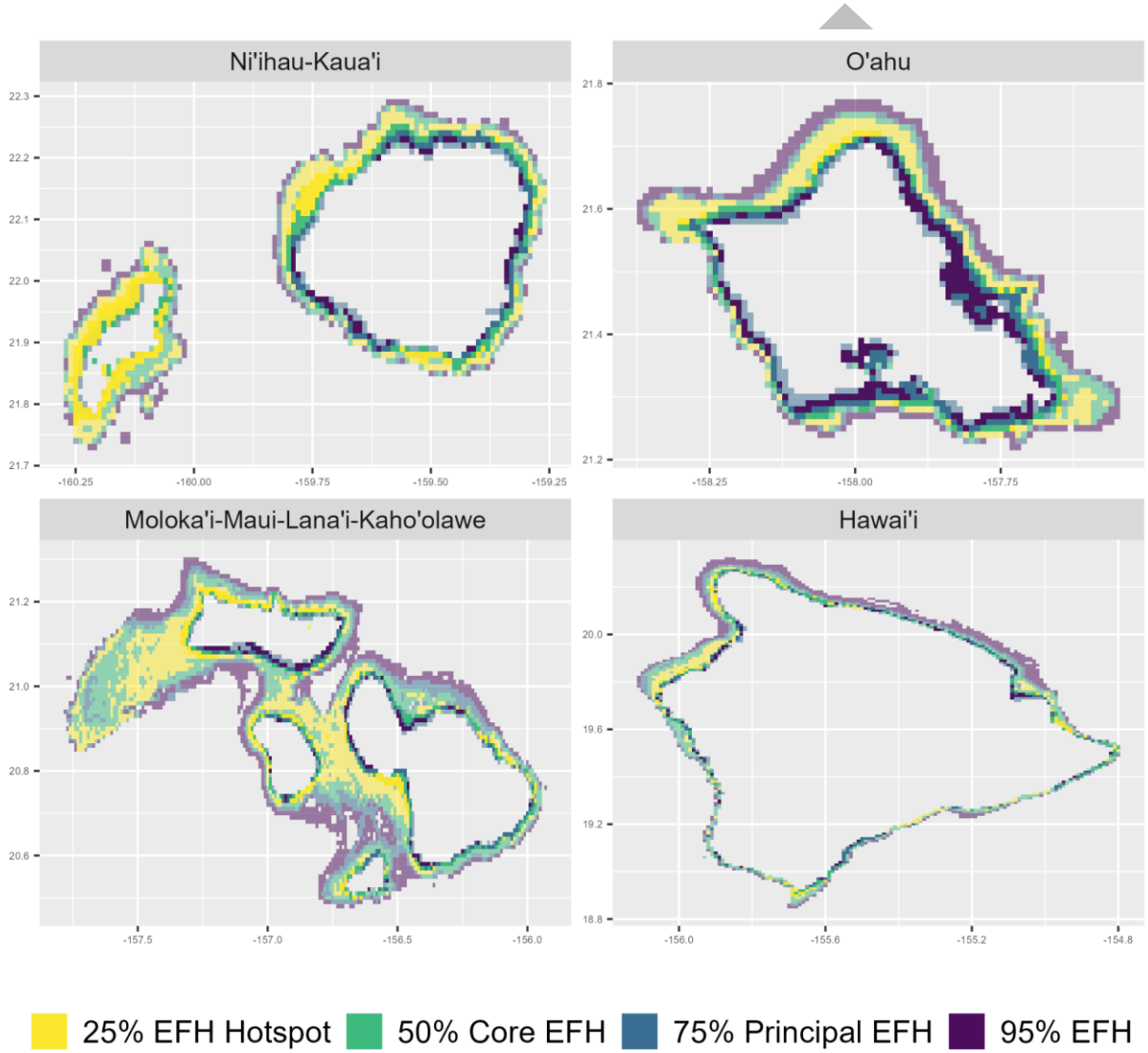

Figure 7. Overlay of model derived EFH subcategories from both the presence-absence (Level 1) models developed by Franklin (2021) and the density (Level 2) model developed by Tanaka et al. (2022) for uku in the MHI.

3.8.1.1 Marine Protected Areas

Bottomfish fishing is prohibited in the following marine protected areas (MPAs): for all bottomfish in Kahoolawe Island Reserve, Papahānaumokuākea Marine National Monument, and in State of Hawaii MPAs where and/or when fishing is prohibited. Bottomfish fishing does occur in the Hawaiian Islands Humpback Whale National Marine Sanctuary but is not known to adversely affect any of the resources or habitat of the Sanctuary. Other areas considered to have sensitive habitat value include areas designated by NMFS and the Council as EFH and HAPC, and critical habitat (see above, Section 3.8.1).

3.8.1.2 Vulnerable Marine or Coastal Ecosystems

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

Known precious coral beds in the action area in the MHI are located off the southern shore of Kauai, Oahu (Makapuu and Kaena point), Maui (Auau Channel), Hawaii Island (Keahole point and between Milolii and South Point; Table 15 ; NMFS 2013a). The beds off southern Kauai and in the Auau channel are black coral beds, and generally shallower than the depth zone where fishing for Deep 7 bottomfish is conducted. Known beds of pink, gold and bamboo corals are found at Makapuu, Kaena point and Keahole Point.

Table 15. EFH and HAPC for precious corals in the MHI

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

3.9 Socio-economic Setting

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

3.9.1 Fishing Communities

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

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

3.9.1.1 Fishery Participants

Commercial

Any person taking any marine life for commercial purposes in Hawaii is required to obtain a CML from the State of Hawaii and submit monthly reports of all catch to the Division of Aquatic Resources. The collection of commercial fishing reports comes through two sources: paper reports received by mail, fax, or PDF copy via e-mail, and reports filed online through the Online Fishing Report system. These data are shared with NMFS and the Council for tracking catches relative to the ACL. The number of fishermen licensed to commercially harvest bottomfish in the MHI increased dramatically in the 1970s, and peaked in late 1980s with 509 active vessels in a single year. However, participation in the fishery then declined in the early 1990s, rebounded somewhat in the late 1990s, but has decreased in recent years to a low of 379 licensed vessels in 2022. In the last 10 years, an average of 305 licensees have reported uku catch each year. Of the

licenses reporting catching uku over the past 10 years, 41.9 percent report deep-sea handlining, 11.5 percent report inshore handlining, 9.4 percent report trolling, and 37.2 percent report other methods, primarily casting.

Annual catch limits were first specified for non-Deep 7 bottomfish in 2012. Since that time, participation in the commercial fishery sector (measured by the number of fishermen with licenses reporting catch of uku) has shown a slow but increasing decline since 2015 (Table 16). Effort, measured by the number of fishing trips, has also decreased, especially in the last three years. The overall number of commercial uku fishing reports generally mirrors total trips, with a clear decline in the last three years (Table 16).

Table 16. Summary of fishing activity in the commercial uku fishery from 2013 to 2023

Year	Licenses	Trips	# reports	No. caught
2013	395	1,814	1,054	14,052
2014	379	1,679	1,004	11,687
2015	417	1,846	1,085	12,882
2016	378	1,914	1,051	15,129
2017	363	1,776	1,019	17,507
2018	286	1,235	746	10,145
2019	286	1,295	793	11,106
2020	253	1,031	626	5,952
2021	233	1,006	612	7,440
2022	235	895	570	6,724
2023	217	830	536	6,138
5-yr avg.	245	1,011	627	7,472
10-yr avg.	305	1,351	804	10,471

Source: WPFMC (2024).

Non-Commercial

A Main Hawaiian Islands Non-Commercial Bottomfish Permit is required for any person, including vessel owners, fishing non-commercially for bottomfish MUS in the EEZ around the main Hawaiian Islands. If the fisherman possesses a current state of Hawaii CML or is a charter fishing customer, he or she is not required to have this permit. There are very limited data on the non-commercial fishing sector for uku in the MHI. In 2007, NMFS and the Council implemented a suite of measures to monitor fishing mortality of MHI bottomfish (including Deep7 and non-Deep 7 bottomfish), including mandatory permit and reporting requirement for the non-commercial bottomfish sector in Federal waters to complement the Hawaii commercial license reporting requirement (WPFMC and NMFS 2007). Initially, NMFS issued 76 non-commercial bottomfish permits in 2008 and 91 in 2009; however, since then, the number of permits issued has declined precipitously to two in 2018 and zero in 2021. Similarly, four catch reports were received the first two years of the program, but no reports have been received since 2011.
It has been suggested that some non-commercial bottomfish fishermen have opted to obtain a State CML rather than the Federal non-commercial permit, because there is no bag limit associated with the State CML and the CML had cost roughly the same amount as the Federal

permit. Although the State doubled the cost of a CML recently, the change in cost did not result in a migration back to Federal non-commercial permits. Cost-earning surveys conducted by Hospital and Beavers (2012) report that over 20 percent of CML holders do not sell any bottomfish, indicating that a substantial number of CML holders are non-commercial. Therefore, it is possible that some non-commercial catch of uku is being reported through the CML system rather than through Federal non-commercial logbooks. However non-commercial catch from fishermen who do not have a CML, and that fish in State waters, is not reported because the State does not require a license or catch reporting for non-commercial fishing in State waters. However, uku catch from non-commercial fishing in State waters is estimated by HMRFS and MRIP surveys.

Subsistence fishing

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

Safety at Sea

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

3.9.1.2 Revenue

In 2023, uku commercial fishermen landed an estimated 41,037 lb of uku, which was sold for an estimated total of $302,228 at a value of $7.36 per lb (Table17). The initial impact of the COVID-19 pandemic on the MHI uku fishery was significant as hotel and restaurant demand was almost eliminated. As tourists returned to Hawaii following the easing of travel restrictions, uku wholesale prices increased. However, the fishery did not show an immediate commensurate response, with landings remaining below pre-pandemic levels (WPFMC 2024). The fishing community noted that depredation losses (both fish and gear) may be causing some fishers to shift away from targeting uku.

Table17.Summary of estimated revenue in MHI uku commercial fishery

Year	Lb. Caught	Lb. Sold	Est. value ($)	Price ($/lb)
2013	121,477	102,079	430,512	5.25
2014	97,004	82,571	366,923	5.45
2015	101,897	92,063	425,310	5.61
2016	118,598	113,662	564,044	5.91
2017	132,734	124,762	602,916	5.61
2018	75,250	69,495	369,574	6.07
2019	90,017	82,756	417,943	5.67

2020	48,038	37,553	181,116	5.33
2021	60,363	52,052	311,246	6.37
2022	52,973	46,178	341,529	7.63
2023	45,010	41,037	302,228	7.36
5-yr avg.	59,280	51,915	310,812	6.47
10-yr avg.	82,188	74,213	388,283	6.10

Source: WPFMC (2024).

3.9.2 Scientific, Historic, Cultural and Archaeological Resources

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

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

3.10 Management Setting

3.10.1 Administrative and Regulatory Processes

Under the authority of the Magnuson-Stevens Act, NMFS is responsible for implementing regulations to sustainably manage the BMUS fishery in Federal waters surrounding the MHI. The NOAA Office of Law Enforcement (OLE) and the U.S. Coast Guard enforce Federal fisheries rules. They may conduct enforcement activities through patrols both on and off the water, and they also conduct criminal and civil investigations. The Enforcement Section of the NOAA Office of General Counsel provides legal support to the NOAA OLE and other NOAA offices, and prosecutes cases.

NMFS is mandated to implement ACLs and AMs annually for each stock or stock complex of MUS identified in an FEP. Federal regulations require both commercial and non-commercial bottomfish fishermen in Hawaii to obtain a Federal permit and report all catch (50 CFR 665). NMFS accepts the Hawaii CML in lieu of a Federal permit and has established a non-commercial permit that must be carried while fishing for BMUS in Federal waters. All reported catch from commercial and non-commercial fishing, and in State or Federal waters is counted toward an ACL, when an ACL is specified. Regardless of whether an ACL is specified or not, commercial uku catches are monitored using data from the State of Hawaii commercial fishing report system and reported in annual reports from the Council (e.g., WPFMC 2024). Catch data is monitored in-season on a monthly basis, and post-season on an annual basis.

To prevent and minimize adverse bottomfish fishing impacts to EFH, each western Pacific FEP prohibits the use of explosives, poisons, bottom trawl and other non-selective and destructive fishing gear. State laws governing the bottomfish fishery in the MHI include CMLs and reporting requirements. 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.

3.11 Resources Eliminated from Detailed Study

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

4 Potential Effects of the Alternatives

This section describes the potential effects of each Alternative on the components of the affected environment or other socio-economic elements identified in Section **Error! Reference source not found.** above. Potential effects, or impacts, of the Alternatives considered in this SEA are classified in terms of scale, duration, magnitude, and whether the effects are beneficial or adverse. Scale refers to the geographic extent of the proposed action, and will be classed as either small-scale, minor, or major. The duration of the effects will be either short-term, long-term, or permanent. Effect magnitude is classed as one of: no effect, negligible, minor, moderate, or major. For adverse effects, the three dimensions (scale, duration, and magnitude) will be considered to determine if the effect is significant. For an effect to be generally considered to meaningfully contribute to a significant impact, the scale would be major, the duration would be long-term or permanent, and the magnitude would be major.

This analysis references the same analysis associated with the 2022–2025 MHI uku ACL action. The entirety of section 4, "Environmental effects of the Alternatives", in the 2022 EA (NMFS 2022a) is incorporated here by reference. Across all of the alternatives considered here, our analysis, consistent with the analysis in the 2022 EA, indicates that the current action to specify ACLs and AMs for MHI uku in 2026–2029 does not have the potential to have a significant effect on the human environment. The current fishery catches considerably less, on average, than the proposed ACLs, and so we expect no change to the fishery in terms of fishing methods, locations or timing and thus no change in effects of the fishery on physical, biological, or protected resources, marine habitats, socio-economic setting, or management setting.

4.1 Alternative 1 (no action)

Under Alternative 1, there would be no ACLs or AMs defined for the MHI uku fishery in 2026–2029. We expect that the fishery would continue as it has in recent years, with an average catch of about 250,000 lb, or about 60 percent of the OFL specified in the 2024 assessment (Nadon 2024).

4.1.1 Physical Resources

There are no known significant impacts to air quality, noise, water quality, view planes, or terrestrial resources from past or current bottomfish fishing activity. Fishing behavior and effort (Section **Error! Reference source not found.**) are not expected to change under any Alternative in a manner that would result in effects on physical resources. Therefore, given the characteristics of the vessels in the fishery and the offshore nature of the fishing activity, none of the alternatives,

including this no action alternative, would result in impacts to air quality, noise, water quality, view planes, or terrestrial resources. The fishery is very targeted at bottomfish species, and fishing gear remains in the water column only while actively fishing. The fishery is having no effect on unique features of the geographic environment, and the Alternatives would have no effect on such resources as marine protected areas because the fishery does not overlap with any such area.

4.1.2 Biological Resources

Target species

Under this no action alternative, NMFS would not implement an ACL or AM for uku in the MHI from 2026–2029. However, NMFS and the Council would continue to monitor catches based on all available sources of information, including commercial catch reports and the Hawai‘i Marine Recreational Fishing Survey. Under this Alternative, the fishery, given recent average catches, would not be likely to exceed the OFL but may exceed catch levels that ensure sustainability and consider scientific and management uncertainty. As discussed in section **Error! Bookmark not defined.**, reported total catches of uku were not constrained by management in recent years and have always remained below the estimated OFL of 418,437 lb (Table 4) based on the most recent stock assessment (Nadon 2024). The lack of an ACL and AMs under Alternative 1 means NMFS and the Council would be unable to prevent overfishing and ensure the long-term sustainability of the MHI uku stock should fishing effort increase. The most recent assessment (Nadon 2024) indicates the biomass of the stock is higher than that expected to produce the maximum sustainable yield, and thus fishery removals would be expected to have either no effect or small-scale, short-term, negligible to minor beneficial effects on the productivity of the stock. Beneficial effects could occur if biomass was reduced to a level where stock productivity is expected to increase.

Non-target and bycatch species

The depth range of uku overlaps with Deep 7 BMUS such as opakapaka (NMFS 2016), so incidental catch of these fish could occur from uku fishing. MHI Deep 7 bottomfish are managed under an ACL and AMs that include an in-season closure and potential overage adjustments to the ACL in subsequent years. When the MHI Deep 7 bottomfish fishery closed in the past, fishermen tended to target uku; however, the Deep 7 fishery is unlikely to be closed in the immediate future given that catches over the last ten years have averaged just over half of the proposed Deep 7 ACL of 492,000 lb for fishing years 2024-25 through 2026-27. Any Deep 7 bottomfish reported from uku fishing would be applied to the Deep 7 ACL implemented by NMFS for that species complex, and would not result in effects to the stock that are not already accounted for by the most recent Deep 7 stock assessment (Syslo et al. 2024) and the draft SEA (NMFS 2025) supporting the proposed implementation of the Deep 7 bottomfish ACL. This stock is healthy and uku fishing under this Alternative would have no effects on Deep 7 bottomfish that are not already considered in management of that stock complex.

Bycatch in the uku fishery is very low, averaging less than 1.3 percent of total catch by number of fish in recent years (WPFMC 2024). Under this alternative, fishery effects on non-target stocks are expected to continue at low levels. Some ECS (such as white ulua and kahala) are rarely incidentally caught while fishing for uku. However, non-target ECS are generally not retained.

Electronic navigation and fish-finding equipment greatly aid fishermen in returning to a particular fishing spot and catching desired species with little incidental catch (Haight 1989). Most bycatch species are also relatively shallow water species and/or those that do not experience severe effects of barotrauma (Kawamoto and Gonzales 2005), are known to be ciguatoxic, and have little or no market value (i.e., kahala, butaguchi and white ulua) or are sharks which are released alive.

It is not expected that fishing for uku under Alternative 1 would change given recent catch history, or that the fishery would have greater effects on non-target or bycatch species than it has in recent years. Ongoing fisheries monitoring by NMFS and the Council would help fishery scientists and managers to detect any increase in non-target catch or bycatch and address any potential concerns in future management measures as needed. For these reasons, even without ACL or AM management, the expected effects of Alternative 1 on target and non-target stocks would be small-scale, short-term, negligible adverse impacts to non-target catch, and either no effect or small-scale, short-term, negligible to minor beneficial effects on the MHI uku stock. Target and non-target stocks are expected to remain healthy under Alternative 1, though this alternative does not provide management measures to ensure the sustainability of the uku fishery.

4.1.3 Protected Species

As described in section 3.7, protected species occur in the waters around the Hawaiian Islands and there is the potential for interactions with the MHI uku fishery. This fishery has been evaluated for impacts on protected resources and is managed in compliance with the requirements of the Magnuson-Stevens Act, the MMPA, the ESA, the Migratory Bird Treaty Act, and other applicable statutes. Section 3.7 describes the baseline with respect to recent and projected interactions between the uku fishery operating under the baseline. The fishery is known to have a low level of interactions with protected species incidental to fishing including with marine mammals, sea turtles, seabirds, sharks, and rays

This no action Alternative would not change the manner in which the fishery operates with respect areas fished, gear used, or methods employed, so interactions with protect species and their habitats are not anticipated to change in frequency or intensity from those analyzed in the 2022 EA. As described in section 3.7 of this document, findings of the 2008 BiOp (NMFS 2008), as supplemented by memos regarding monk seal critical habitat and a BiOp focused on IFKW critical habitats and oceanic whitetip sharks (NMFS 2022b), indicate that the MHI uku fishery either has no effect or may affect but is not likely to adversely affect protected species and their habitats. In terms of our analysis under NEPA, effects to protected species would be considered small-scale, short-term, negligible to minor adverse effects on protected species. The current BiOp and associated supplemental documents provide for the incidental taking of species protected under the ESA in this fishery.

4.1.4 Socio-Economic Setting

As described in section 3.9, the affected fishing communities are the seven populated islands in the main Hawaiian Islands. Under this Alternative, we do not expect any changes to the manner in which the fishery operates with respect areas fished, gear used, or methods employed. We would expect that the fishery would continue as it has in recent years. Given the current assessment that the stock is healthy and recent catches have been well below the current estimate of the OFL, communities that rely on uku would see no changes in the availability of uku in the short and

long-term for sale or consumption under this no-action Alternative. The uku fishery is sustainable, and provides a local source of fresh fish for distribution and consumption in these communities. Under this no-action Alternative, the only potential negative effects to the socio-economic setting would be if fishing effort more than doubled, and there were no management measures in place to ensure the long-term sustainability of the fishery. Such an increase in effort is not anticipated, and would be recognized through ongoing collection of catch and effort data from the fishery. Overall, we expect this no-action Alternative to have small-scale, short-term, minor beneficial effects on socio-economic setting, through the continued supply of this fish into communities and local markets.

4.1.5 Habitats and Vulnerable Ecosystems

As described in section 3.8, there are EFH for various life stages of MHI bottomfish and other species that overlaps with the fishery, including habitat areas of particular concern (HAPC, Table 13). Due to the nature of this fishery, as described in section 3.1, generally including fishing gear dropped vertically from fishing vessels or trolling through pelagic areas, fishing gear generally does not every remain in contact with the bottom and is rarely lost. Presence of the fishing gear in the environment is extremely transitory, and most areas of EFH may never see fishing gear for uku. There are preferred fishing locations that likely see fishing gear as many as a few times per day, but there is no lasting effect from the presence of the gear. The gear may very rarely be lost, and when gear are dropped vertically, they may be dropped until they contact the bottom and then raised slightly. For this reason, we think that there is no effect of the fishery on habitats and vulnerable ecosystems, or at most a small-scale, short-term, negligible adverse effect.

4.1.6 Management Setting

Under this no-action Alternative, if the MHI uku fishery remains consistent with recent effort and catch trends, there would be no impact to the management setting. Fishing effort and catch would continue to be reported, and we anticipate that effort and catches would remain consistent with recent trends. Without ACLs and AMs, there is no mechanism to bring the fishery into check if there was a wholesale increase in fishing effort that resulted in doubling or more of catch. In this case, if the high effort were to persist over years, the fishery could become unsustainable. This outcome is so unlikely given recent fishery information that we consider this Alternative to have no effect on the management setting. However, the FEP requires fisheries for management unit species to have ACLs and AMs, among other requirements, and thus adopting this no-action Alternative would violate the FEP. Despite this, the no-action Alternative is an essential feature of the affects analysis, as it serves as a measure of baseline effects to which the effects of all action Alternatives can be compared.

4.2 Potential Effects of Alternative 2 (*status quo*)

The analysis in this subsection presents the anticipated effects of Alternative 2 that would implement ACLs and AMs consistent with management of the MHI uku fishery from 2022–2025; an ACL of 295,419 lb, an ACT of 291,010 lb, and both in-season and post season AMs (NMFS 2022a). This Alternative is inconsistent with the current best available scientific information from the most recent assessment (Nadon 2024).

4.2.1 Physical Resources

As described for Alternative 1 (section 4.1.1), the nature of the fishery is such that we expect no effect or, at most, small-scale, short-term, negligible effects of the fishery on physical resources.

4.2.2 Biological Resources

Target species

Under Alternative 2, the combined commercial and non-commercial fishery would be limited to an ACL of 295,419 lb. In addition, this alternative would include an ACT of 291,010 lb relative to in-season catch to reduce the likelihood of exceeding the ACL due to uncertainty in non-commercial catch estimates. Total catch would be unlikely to reach the ACT if fishery performance is similar to the average of recent years, but may reach this level if total fishery performance is similar to the recent high in 2017 (**Error! Reference source not found.Error! Reference source not found.**). In-season closures are possible and, based on recent fishing history, are expected to occur with a probability of one in three, although total catches in have not exceeded the ACT under this alternative since 2012 (**Error! Reference source not found.Error! Reference source not found.**). If an in-season closure occurred, it would likely occur at the end of the year and have minor fishery impacts. If closed in-season, some fishermen may target uku in State waters but catch in those waters would continue to be monitored; commercial catch in State waters would be reported through the same CML system used to track uku catch throughout the MHI and non-commercial uku catch in State waters would be estimated by the HMRFS and MRIP surveys. A post-season overage adjustment is unlikely to be needed as the recent three-year average combined commercial and non-commercial catch has not exceeded the ACL. Despite this potential for fishery closures under this Alternative, we imagine that the effects of the fishery on target species will be the same as Alternative 1, based on reducing the size of the stock closer to the level at which it is most productive. For this reason, we expect either no effect or small-scale, short-term, negligible to minor beneficial effects on the productivity of the uku stock.

Non-target species and bycatch

For the reasons described for Alternative 1 (section 4.1.2), the combined commercial and non-commercial uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternative 2. Like other alternatives, incidental catch of Deep 7 BMUS and other bycatch species during commercial uku fishing would be monitored through the State CML program and HMRFS and MRIP surveys for the non-commercial fishery. Bycatch of non-target stocks in both fisheries is expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi and white ulua), or sharks which are released alive. We expect that under Alternative 2 there would be small-scale, short-term, negligible adverse impacts to non-target catch.

4.2.3 Protected Species

As detailed in section 3.7 and in section 4.1.3 for Alternative 1, there are rare interactions with protected species in the MHI uku fishery. Under Alternative 2, because there would be no expected change in the fishery in terms of fishing methods, areas fished, or magnitude of the

fishery, unless the ACT was reached and the fishery closed – likely near the end of the fishing year. If the fishery was closed, we anticipate some increase in targeting of uku in nearshore areas, or a switch to targeting Deep 7 bottomfish. However, those changes would not likely change the impact of those fisheries in protected species, as they would result in negligible increases in fishing effort. For this reason, we imagine that the impacts to protected species would be similar to those described for Alternative 1; small-scale, short-term, negligible to minor adverse effects on protected species.

4.2.4 Socio-economic setting

As described in section 3.9, the affected fishing communities are the seven populated islands in the main Hawaiian Islands. Under this Alternative, as described for Alternative 1 (section 4.1.4), we do not expect any changes to the manner in which the fishery operates with respect areas fished, gear used, or methods employed. Overall, we expect Alternative 2, consistent with the no-action alternative, to have small-scale, short-term, minor beneficial effects on socio-economic setting in most years, with small-scale, short-term, minor adverse effects if the fishery reached the ACT and was closed for the remainder of the year.

4.2.5 Habitats and Vulnerable Ecosystems

As detailed in section 3.8 and in section 4.1.5 for Alternative 1, there are EFH for various life stages of MHI bottomfish and other species that overlaps with the fishery, including habitat areas of particular concern (HAPC, Table 13). Under Alternative 2, because there would be no expected change in the fishery in terms of fishing methods, areas fished, or magnitude of the fishery. For the reasons described in Section 4.1.5, there likely is no effect of the fishery on habitats and vulnerable ecosystems, or at most a small-scale, short-term, negligible adverse effect.

4.2.6 Management Setting

Under Alternative 2, NMFS and the Council would continue to monitor uku catch against the ACT and ACL. NMFS will continue to monitor catch data through CML reporting and HMRFS as it becomes available, in collaboration with the state of Hawai‘i and the Council.

The in-season AM would require NMFS to close the fishery in Federal waters if the ACT is projected to be reached. NMFS would not require an additional action by the Council to close Federal waters, but a closure would require administrative resources by NMFS to implement and enforce the closure. If the fishery is projected to reach the ACT resulting in an in-season closure of Federal waters, we anticipate that it would occur near the end of the year. Fishermen could continue to fish for other species in Federal waters, and for uku – both commercially and non-commercially – in state waters. All uku caught in state waters still count toward the total catch for that year relative to the post-season AM.

The lack of a concurrent uku fishery closure in state waters may make enforcement of the Federal waters closure challenging because, without an enforcement officer observing the catch locations, it would be impossible to know if an uku was caught in Federal or State waters, although the boundary of Federal and state waters three miles from shore is easily determined using the Global Positioning Systems that all fishermen can access via electronics on board their vessels or on their phones. NMFS has utilized an in-season closure as an AM in the Hawaii Deep 7 bottomfish

fishery since 2007, and enforced its closure when the fishery reached its catch limit in each of 2007-2010. Under Alternative 2, if the MHI uku fishery were closed in Federal waters, OLE and USCG would be responsible for enforcing the closure through patrols. Overall, if there was a closure, we would expect only small-scale, short-term, negligible adverse effects on management setting.

4.3 Potential Effects of Alternatives 3 and 5

The analysis in this subsection presents the anticipated effects of Alternative 3 and 5, which would implement ACTs, ACLs and in-season and post-season AMs for the MHI uku fishery for fishing years 2026 to 2029. As AMs under both Alternatives, if the fishery is expected to reach or exceed the ACT, NMFS would implement an in-season closure of the uku fishery in Federal waters. Further, if the most recent three-year average catch of exceeds the proposed ACL, NMFS would implement a revised ACL for the MHI uku fishery in the subsequent year that is reduced by the amount of the overage. Alternative 3 would set the ACT and ACL based on the results of the 2020 P* and SEEM analyses, whereas Alternative 5 takes a more cautious approach and sets the ACT and ACL at levels lower than the P* and SEEM analyses results. Given that these Alternatives are similar with respect to setting ACT, ACLs and AMs, both Alternative 3 and 5 are expected to have the same effects on the human environment; although we note where we expect any differences.

4.3.1 Physical Resources

As described for Alternative 1 (section 4.1.1), the nature of the fishery is such that we expect no effect or, at most, small-scale, short-term, negligible effects of the fishery on physical resources across Alternatives 3 and 5.

4.3.2 Biological Resources

Target species

Alternatives 3 and 5 would specify combined commercial and non-commercial ACL of uku that are below the OFL estimated for uku in the 2024 stock assessment update and below the ABC set by the SSC. In addition, Alternatives 3 and 5 would include an ACT relative to in-season catch to reduce the likelihood of exceeding the ACL due to uncertainty in non-commercial catch estimates. Alternative 3 considers scientific and management uncertainty through the P* and SEEM analysis. Alternative 5 considers scientific and management uncertainty and takes a more precautionary approach to prevent overfishing by setting the catch limits lower than suggested by the P* and SEEM analyses.

Total catch is not likely to reach the ACLs under Alternatives 3 or 5 if the fishery performance is similar to fishery performance over the past 10 years. Over the past decade, the fishery has not exceeded MSY values, and participation in the fishery has steadily declined. If the fishery performs close to the highest recent catch of about 314,269 lb during the 2014 fishing year, the fishery would remain open throughout each of the next three years. If an in-season closure occurred, it would likely occur at the end of the year. If closed in-season, we expect some fishermen may target uku in State waters as described in section 4.2.2 for Alternative 2, but that catch would be monitored. A post-season overage adjustment is unlikely to be needed as the recent three-year average combined commercial and non-commercial catch has not exceeded the

ACL. Despite this potential for fishery closures under this Alternative, we imagine that the effects of the fishery on target species will be the same as Alternative 1, based on reducing the size of the stock closer to the level at which it is most productive. For this reason, we expect either no effect or small-scale, short-term, negligible to minor beneficial effects on the productivity of the stock.

Non-target species and bycatch

For the reasons described for Alternative 1 (section 4.1.2), the combined commercial and non-commercial uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternatives 3 and 5. Like other alternatives, incidental catch of Deep 7 BMUS and other bycatch species during commercial uku fishing would be monitored through the State CML program and HMRFS and MRIP surveys for the non-commercial fishery. Bycatch of non-target stocks in both fisheries is expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi and white ulua), or sharks which are released alive. We expect that under Alternative 3 and 5 there would be small-scale, short-term, negligible adverse impacts to non-target catch.

4.3.3 Protected Species

As detailed in section 3.7 and 4.1.3 for Alternative 1, there are rare interactions with protected species in the MHI uku fishery. Under Alternatives 3 and 5, because there would be no expected change in the fishery in terms of fishing methods, areas fished, or magnitude of the fishery, unless the ACT was reached and the fishery closed. If the fishery was closed, we anticipate some increase in targeting of uku in nearshore areas, or a switch to targeting Deep 7 bottomfish. However, those changes would not likely change the impact of those fisheries in protected species, as they would not be expected to cause increases in fishing effort overall. For this reason, we imagine that the impacts to protected species would be similar to those described for Alternative 1: small-scale, short-term, negligible to minor adverse effects on protected species.

4.3.4 Socioeconomic setting

Under Alternatives 3 and 5, the proposed ACTs and ACLs (Table 7) would be less restrictive than the status quo, Alternative 2. As described in section 3.9 and 4.1.4, the affected fishing communities are the seven populated islands in the main Hawaiian Islands. Under Alternatives 3 and 5, we expect that the fishery would continue as it has in recent years with no changes to the manner in which the fishery operates with respect areas fished, gear used, or methods employed. Given the current assessment that the stock is healthy and recent catches have been well below the current estimate of the OFL, communities that rely on uku would see no changes in the availability of uku in the short and long-term for sale or consumption. The uku fishery is sustainable, and provides a local source of fresh fish for distribution and consumption in these communities. Under Alternatives 3 and 5, if the fishery were to perform similar to 2022 at 292,663 lb or 2014 at 314,269 lb (WPFMC 2024), then the fishery would not be constrained by the ACT and there would be no closure in Federal waters. Such an increase in effort is not anticipated, and would be recognized through ongoing collection of catch and effort data from the fishery. Overall, we expect Alternatives 3 and 5 have the same small-scale, short-term, minor beneficial effects on socio-economic setting as the previously described Alternatives 1 and 2.

4.3.5 Habitats and Vulnerable Ecosystems

As detailed in section 3.8 and in section 4.1.5 for Alternative 1, there are EFH for various life stages of MHI bottomfish and other species that overlaps with the fishery, including habitat areas of particular concern (HAPC, Table 13). Under Alternatives 3 and 5, because there would be no expected change in the fishery in terms of fishing methods, areas fished, or magnitude of the fishery. For the reasons described in Section 4.1.5, there likely is no effect of the fishery on habitats and vulnerable ecosystems, or at most a small-scale, short-term, negligible adverse effect.

4.3.6 Management Setting

Under Alternatives 3 and 5, NMFS and the Council would continue to monitor uku catch against the ACT and ACL. NMFS will continue to monitor catch data through CML reporting and HMRFS as it becomes available, in collaboration with the state of Hawai‘i and the Council.

Similar to Alternative 2 (section 4.2.6), in-season AM would require NMFS to close the fishery in Federal waters if the ACT is projected to be reached. NMFS would not require an additional action by the Council to close Federal waters, but a closure would require administrative resources by NMFS to implement and enforce the closure, but would have small-scale, short-term, negligible adverse effects on management setting.

4.4 Potential Effects of Alternatives 4 and 6

The analysis in this subsection presents the anticipated effects of Alternatives 4 and 6, which would implement ACLs and post-season AMs for the MHI uku fishery for fishing years 2026 to 2029. As AMs under both Alternatives, if the most recent three-year average catch of uku exceeds the proposed ACL, NMFS would implement a revised ACL for the MHI uku fishery in the subsequent year that is reduced by the amount of the overage. Alternative 4 would set the ACL based on the results of the 2020 P* and SEEM analyses, whereas Alternative 6 takes a more cautious approach and sets the ACT and ACL at levels lower than the P* and SEEM analyses results. Given that these Alternatives are similar with respect to setting ACLs and AMs, both Alternatives 4 and 6 are expected to have the same effects on the human environment; although we note where we expect any differences.

4.4.1 Physical Resources

As described for Alternative 1 (Section 4.1.1), the nature of the fishery is such that we expect no effect or, at most, small-scale, short-term, negligible effects of the fishery on physical resources across alternatives 4 and 6.

4.4.2 Biological Resources

Target species

Alternatives 4 and 6 would specify combined commercial and non-commercial ACL of uku that are below the OFL estimated for uku in the 2024 stock assessment update and below the ABC set by the SSC. Alternative 4 considers scientific and management uncertainty through the P* and

SEEM analysis. Alternative 6 considers scientific and management uncertainty and takes a more precautionary approach to prevent overfishing by setting the catch limits lower than suggested by the P* and SEEM analyses (Table 8).

Total catch is not likely to reach the ACLs under Alternatives 4 and 6 if fishery performance is similar to the past 10 years. Over the past decade, the fishery has not exceeded MSY values, and participation in the fishery has steadily declined. Even if the fishery performs close to the highest recent catch of 314,269 lb (2014) in one year a post-season overage adjustment is unlikely to be needed as the recent three-year average combined commercial and non-commercial would be unlikely to be greater than the ACL. We anticipate that the effects of the fishery on target species will be the same as Alternative 1 (section 4.1.2), based on reducing the size of the stock closer to the level at which it is most productive. For this reason, we expect either no effect or small-scale, short-term, negligible to minor beneficial effects on the productivity of the stock.

Non-target species and bycatch

For the reasons described for Alternative 1 (section 4.1.2), the combined commercial and non-commercial uku fishery is not expected to have adverse effects on non-target or bycatch species under Alternatives 4 and 6. Under all of the alternatives, incidental catch of Deep 7 BMUS and other bycatch species during commercial uku fishing would be monitored through the State CML program and HMRFS and MRIP surveys for the non-commercial fishery. Bycatch of non-target stocks in both fisheries is expected to continue at low levels and consist of primarily ECS that are known to be ciguatoxic and have little or no market value (i.e., kahala, butaguchi and white ulua), or sharks which are released alive. We expect that under Alternatives 4 and 6 there would be small-scale, short-term, negligible adverse impacts to non-target catch.

4.4.3 Protected Species

As detailed in section 3.7 and 4.1.3 for Alternative 1, there are rare interactions with protected species in the MHI uku fishery. Under Alternative 4 and 6, because there would be no expected change in the fishery in terms of fishing methods, areas fished, or magnitude of the fishery we anticipate that the impacts to protected species would be small-scale, short-term, negligible to minor adverse effects.

4.4.4 Socioeconomic setting

Under Alternatives 4 and 6, the proposed ACLs (Table 8) would be less restrictive than the status quo, Alternative 2. As described in sections 3.9 and 4.1.4, the affected fishing communities are the seven populated islands in the main Hawaiian Islands. Under Alternatives 4 and 6, we do not expect any changes to the manner in which the fishery operates with respect to areas fished, gear used, or methods employed, and thus we expect Alternatives 4 and 6 – like previous Alternatives – to have small-scale, short-term, minor beneficial effects on the socio-economic setting.

4.4.5 Habitats and Vulnerable Ecosystems

As detailed in section 3.8 and in section 4.1.5 for Alternative 1, there are EFH for various life stages of MHI bottomfish and other species that overlaps with the fishery, including habitat areas

of particular concern (HAPC, Table 13). Under Alternative 4 and 6, because there would be no expected change in the fishery in terms of fishing methods, areas fished, or magnitude of the fishery. For the reasons described in Section 4.1.5, there likely is no effect of the fishery on habitats and vulnerable ecosystems, or at most a small-scale, short-term, negligible adverse effect.

4.4.6 Management Setting

Under Alternatives 4 and 6, as described for previous Alternatives (sections 4.1.6, 4.2.6, 4.3.6), NMFS and the Council would continue to monitor uku catch against the ACT and ACL. NMFS will continue to monitor catch data through CML reporting and HMRFS as it becomes available, in collaboration with the state of Hawai‘i and the Council. No changes to the role of law enforcement agents or the USCG would be required in association with implementing Alternatives 4 and 6 due to the lack of an in-season AM, and thus, like Alternative 1 (section 4.1.6), we expect no effect on management settings under Alternatives 4 and 6.

4.5 Other Potential Effects

4.5.1 Biodiversity and Ecosystem Function

Under the no-action and all action alternatives considered here, the fishery is expected to perform has it has in recent years, with the potential for late-season closures under some alternatives (2, 3, and 5) if fishing were to meet or exceed maximum catches in recent years. The MHI uku fishery is unlikely to negatively impact either biodiversity or ecosystem function, as the uku stock continues to be healthy, the fishery has an extremely low bycatch rate, and because the fishery does not have large and adverse effects on habitats or populations of other fishes as discussed previously (see section **Error! Reference source not found.** and 4.1.5). Also the uku fishery does not have known indirect effects on biodiversity through, for example, impacts on predator-prey relationships or ecosystem productivity, or ecosystem function.

For all but Alternative 1, ACLs are lower than the most recent OFL estimate (302,033 lb) from the 2024 stock assessment (Nadon 2024). The Council developed the proposed ACLs, ACTs, and AMs for all but Alternative 2, which follows the status quo based on the previous assessment (Nadon 2020) using the best available scientific information, in accordance with the fishery regulations, and after considering catches, participation trends, and estimates of the status of fishery resources. The ACLs and AMs are also not likely to cause large adverse impacts to marine resources because harvest levels are currently sustainable and uku fishing is not expected to change under any alternative. NMFS and the Council would continue to monitor catch of MUS and ECS under the Hawai‘i and other applicable FEPs, and would adapt management accordingly should new management needs become apparent.

Potential to introduce or spread of non-native species

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

and effort as compared to baseline conditions. For this reason, none of the alternatives are expected to increase the potential for the spread of alien species into or within Hawaiian waters.

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

4.5.2 Highly uncertain effects, unique or unknown risks

Given recent catch history in the fishery, it is unlikely that operation of the uku fishery would risk effects to the human environment.

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

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

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

4.6 Potential Cumulative Effects of the Alternatives

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

effects analysis examines whether the direct and indirect effects of the alternatives considered on a given resource could interact with the direct and indirect effects of other past, present and reasonably foreseeable actions on that same resource.

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

- Managing MHI non-Deep 7 bottomfish fishery since 2012 with catch limits and accountability measures intended to prevent the fishery from exceeding a catch limit (see Section 1.1for relevant recent fishery management history);
- Ongoing monitoring of the fishery (monthly for commercial fisheries and every two months for non-commercial fisheries) and fishery closures if the fishery is expected to reach an ACT under Alternatives 2, 3 and 5, or a post-season reduction in future ACLs if the three-year average annual catch exceeds the ACL with any of the action alternatives (see Section 2.2). Monitoring of the fishery would continue under all Alternatives.
- Other past management measures for the MHI non-Deep7 bottomfish fishery, and present measures for the uku fishery intended to allow monitoring and enforcement (see Section 3.10).
- Establishment and subsequent expansion of the Papahānaumokuākea Marine National Monument (Monument), which included a prohibition on commercial fishing. NMFS implemented regulations prohibiting commercial bottomfish fishing in the Monument in 2006 (71 FR 51134).
- Periodic benchmark and update stock assessments (e.g., Nadon 2017, Nadon et al. 2020, Nadon 2024). These periodic assessments would continue at roughly three-year intervals regardless of the alternative selected.
- Annual review of the fishery performance by the SSC, the Council, and NMFS; including review of ACLs and AMs and any modifications that may be called for in light of new information. This annual review would not change under any of the action alternatives.
- State regulations help Federal managers and scientists monitor fishing, provide additional fishery regulations, and provide locations for bottomfish research. Regulations by the State of Hawaii that include provisions that may affect uku catch. The uku fishery would continue to be monitored and the in-season closure AM implemented if needed under Alternatives 2, 3 and 5.
- On February 8, 2019, NMFS published a final rule and amendment to the Hawaii FEP that designates a number of species of non-Deep 7 bottomfish as ECS (84 FR 2767). Pursuant to this rule, NMFS and the Council would continue to monitor catch of ECS, but they would not be subject to ACLs. Not implementing ACLs for ECS would not change the potential effects of any of the alternatives considered in this EA because the ACLs for ECS that were previously included in the non-Deep 7 bottomfish did not include AM and catch was only evaluated after the fishing year ended, and because the uku ACLs were not exceeded in recent years. NMFS and the Council also monitor ECS catch to determine if any of these species requires Federal management.

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

- The Council is expected to continue to recommend ACLs for a number of Hawaii FEP MUS, including Deep 7 bottomfish, deepwater shrimp, precious corals, and Kona crab. These fisheries have been managed using ACLs and AMs since 2007 for Deep 7 bottomfish and 2012 for the remaining MUS. The MHI uku fishery does not overlap with these other fisheries to a large extent such that ACLs and AMs under consideration in the uku fishery would result in more fishing in these other fisheries or in the pelagic fisheries, except as discussed previously for Deep 7 bottomfish. Conversely, uku is not caught incidentally in any of these fisheries except in the MHI Deep 7 bottomfish fishery, so implementation of ACLs would not affect the uku fishery as discussed previously. In the case of the Deep 7 fishery, uku may be caught incidentally while fishing for Deep 7 such as opakapaka. Commercial catch of uku would be reported through the State CML reporting system, and would be applied toward the uku ACL. Implementation of the Deep 7 ACL is therefore unlikely to affect the MHI uku fishery. Because these fisheries have a history of management under catch limits, they do not have unknown or uncertain impacts, and do not interact substantially with the MHI uku fishery. For this reason, the impacts of the proposed MHI uku ACL and AM can be considered separately from the ACLs and AMs for other Hawaii fisheries.
- NMFS is expected to develop a new stock assessment for uku that will inform management measures for 2029 and beyond. At such time as the new stock assessment is determined to be BSIA, the Council may make new recommendations for ACLs and AMs for these years. Rules implemented on the basis of these recommendations may change the management measures implemented under the present proposed action for 2026 – 2029. These rules would be implemented according to the same public process as the current action and in accordance with all applicable laws and regulations, and subject to review under NEPA.

Relevant external factors

- A number of factors have the potential to affect participation in MHI commercial bottomfish fisheries, including those targeting uku. Current factors may include, but are not limited to: high fuel costs, high costs of other equipment and supplies, and costs of living that affect time available to fish; experienced fishermen leaving the fishery and the high level of skill needed to enter the fishery (Yau 2018). Although speculative, we do not anticipate a large expansion in uku fishing in the scope of time covered by this EA based on the effects of these external factors. Because of the qualitative nature of this information, we will not refer to these factors in the cumulative effects analysis.

4.6.1 Cumulative Effects Related to Effects on Target and Non-Target Species

The implementation of a multi-year ACL, AMs under any of the action alternatives for the uku fishery over the 2026-2029 management period is not expected to result in cumulative environmental effects or effects to the status of the MHI uku stock. This is because the proposed action would set the ACL below the OFL of 418,437 lb estimated for uku in the 2024 stock assessment (Nadon 2024) at a level that includes consideration of scientific and other uncertainties through the P* and SEEM processes and will not change the fishery. Annual catches

in fishing years 2021–2023 are expected to remain below the proposed ACLs. Analysis in the 2024 stock assessment update found that the uku stock is sustainably managed.

Under Alternative 1, the fishery would not operate with an ACL or AMs in the next four years. This alternative would not provide active management of the uku stock to prevent overfishing and it is inconsistent with the requirements of the Hawai‘i FEP. This no-action alternative is included to provide a baseline impact against which the action alternatives can be compared.

Under Alternatives 2, 3, and 5, fishing could be constrained in-season by a fishery closure if the ACT is projected to be reached. Under Alternatives 4 and 6, there is no in-season AM, but there is a post-season AM relative to the ACL. Alternatives 2 through 6 have a post-season AM where if the three-year average catch exceeds the ACL, the ACL would be decreased post-season in the following fishing year to offset the overage. If the action alternative included an ACT (Alternatives 2, 3, and 5), then this post-season AM would reduce the ACT by the amount of the overage as well. The ACLs and AMs together would result in continued sustainable management of the uku stock in Federal waters and prevent cumulative effects under Alternatives 2 through 6.

Continued management of the fishery under all alternatives is not expected to result in large and adverse effects to the uku stock in the MHI. The 2024 stock assessment update assumes average total catch would be relatively constant and equal to the ACL under Alternatives 3 through 6. If the entire ACL implemented by this EA was not caught in a particular year, the actual risk of overfishing the following year would be less than the estimated risk of overfishing associated with the ACL. For example, if the fishery does not catch 401,020 lb in one or more fishing years as expected, the actual risk of overfishing would be less than 36% for an ACL of 401,020 lb in later fishing years in the 2026-2029 management period. This aspect of the estimates of the risk of overfishing provides an additional layer of precaution to ACLs in future years if catch is lower than the ACL as expected. Based on the recent performance of the fishery, total annual catches are expected to remain below the proposed ACLs most years, so the realized risk of overfishing would likely be less than the 41% (Alternatives 3 and 5) or 36% (Alternative 4 and 6), which is based on year after year catch at the ACL. In addition, the current biomass of the stock is higher than that predicted to provide the maximum sustainable yield, so decreases in overall stock size could be beneficial in terms of increasing yield.

The 2024 stock assessment update considered the potential effects on stock health of commercial and non-commercial catches in the MHI. Therefore, all catches of uku were considered, and there would not be an unknown or unsustainable cumulative effect.

Non-Target Species and Bycatch

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

Implementing ACLs and AMs for uku as proposed under the action alternatives is not expected to cause impacts that interact with potential environmental effects for the MHI Deep 7 bottomfish stock complex. If that fishery were to close, some vessels may switch to fishing for uku. However, based on recent fishing history and expected levels of fishing, the MHI commercial Deep 7 bottomfish fishery in Hawaii is unlikely to close in upcoming fishing years. Regardless of events in the Deep 7 bottomfish fishery, uku catches would continue to be monitored and

reviewed under the ACLs and AMs analyzed in this EA. Conversely, if the uku fishery did close, some fishermen might switch to fishing for Deep 7 bottomfish. This fishery catches well below its ACL, so any effort displaced from uku to the Deep 7 fishery would not affect the sustainability of these stocks. Also, because both fisheries would continue to be monitored and managed for sustainability, the proposal to continue to implement ACLs and AMs for uku would not have effects that could result in cumulatively large and adverse effects on MHI bottomfish stocks or other resources. The proposal to implement ACLs and AMs for MHI uku would not affect the sustainability of MHI Deep 7 bottomfish under future fishing.

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

In 2017, commercial catch of uku was 131,947 lb (WPFMC 2024). This catch is the highest level of commercial catch for the non-Deep 7 bottomfish fishery in the MHI since 1994, but it is below the most recent MHI non-Deep 7 bottomfish ACL (295,419 lb) (NMFS 2022) and the previous estimates of MSY (205,030 lb) and OFL proxy (302,033 lb) for the MHI non-Deep 7 bottomfish (Nadon et al. 2020). The MHI uku fishery has caught only 83%, on average, of the 295,419 lb ACL from 2021 to 2023. Because recent uku ACLs have been higher than average catches and the non-Deep 7 bottomfish fishery was not constrained by any management measures, average catches of MHI non-Deep 7 bottomfish ECS are not expected to change under any alternative under consideration. Catch of non-Deep 7 bottomfish ECS in each of the next three years is expected to remain within the range of recent catch levels. Thus, none of the alternatives are expected to result in a large cumulative effect to non-Deep 7 bottomfish ECS. Catch of non-Deep 7 bottomfish ECS will continue to be monitored through commercial catch reports so NMFS and the Council can adapt future management if fishery targets change.

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

Potential cumulative effects on other Hawaii FEP fisheries

In addition to the ACLs and AMs for uku being considered in this EA, NMFS will implement the Council's ACL and AM recommendations for all other Hawaii fisheries for 2026 and beyond, including crustacean fisheries (deepwater shrimp and Kona crab), and precious coral fisheries (black coral, pink coral, and bamboo coral). These fisheries have been managed using ACLs and AMs since 2012; they do not have unknown or uncertain impacts, and do not interact with the MHI bottomfish fisheries in any way.

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

Potential cumulative effects on protected species

Under all alternatives under consideration, fishing is expected to remain within levels considered during consultations and no additional effects to protected species are expected. The fishery would continue to be authorized and conducted in accordance with Section 7 of the ESA and the MMPA (as described in Sections 3.7.1 and 3.7.2). The analysis of effects of the uku fishery under each of the alternatives found that the fishing is not likely to have significant effects on the survival or recovery of any listed species, largely because the fishery has low levels of interactions with these listed species, because fishery participants release protected species caught on hooks, and because vessel collisions with sea turtles are expected to have no effect on their survival and recovery. NMFS prior analysis of effects on ESA- and MMPA-listed species took into consideration outside actions that affect the same species. In general, continued management of the fishery under the full suite of management measures, including the proposed ACLs and AMs for the next several years, would not change the fishery in any way that is likely to have the potential for large and adverse cumulative effects on listed species.

4.6.2 Cumulative Effects Related to Fishery Participants and Communities

Management of the MHI commercial uku fishery using ACLs and AMs is not known to have large adverse effects on the socio-economic setting. Implementation of an ACL greater than recent average catch allows for greater harvests, associated increases in effort and revenue, and a continued supply of bottomfish to fishing communities (see Sections 4.1.4, 4.2.4, 4.3.4, 4.4.4). Social and economic considerations were incorporated into the development of the ACLs through the Council deliberation process and public comment periods, and none of the proposed ACLs or ACTs are expected to have adverse cumulative effects to the socio-economic setting given the nature of the fishery for uku in the MHI.

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

4.6.3 Cumulative Effects Related to Effects on the Management Setting

The proposed action is a continuation of ongoing, long-term management of the MHI uku fishery in the wake of the 2019 ECS amendment (84 FR 2767) that caused uku to be the only remaining MUS from the MHI non-Deep 7 bottomfish species complex. This fishery has been managed by NMFS and the Council through the specification of ACLs and AMs since 2012, in coordination with the state of Hawaii. Implementation of the proposed ACLs and AMs for the 2026, 2027, 2028, and 2029 fishing years will not change the ongoing management environment, and will not add a cumulative effect to the management setting in a substantial way (Section 4.1.6, 4.2.6, 4.3.6, 4.4.6). None of the proposed ACLs or AMs are expected to result in substantial cumulative adverse effects on the cost of administering the fishery (including monitoring catches, implementing the annual limits, closing the fishery, or enforcing regulations). Because of the lack of large changes in management, none of the proposed alternatives possesses the potential to have substantial cumulative effects on fishery participants in terms of compliance with the fishery requirements.

4.6.4 Other Considerations

4.6.4.1 Changes in the Environment

Changes in the environment of MHI uku from changes in global climate can affect physical and biological conditions of the ocean that in turn can affect marine species. Among the changes being studied include water temperatures and pH, vertical stratification, changes in circulation patterns, thermal expansion, sea level changes, and changes to storm frequency and severity. These changes can affect production, species migrations and distribution, behavior, nutrients, and food web shifts; and could result in positive or negative effects to specific species (Doney 2006; Kleypas et al. 2006; Pörtner et al. 2014; Polovina et al. 2011). Changes to these properties may affect marine species differently through complex physical, physiological, and ecological interactions (Pörtner et al. 2014; Sydeman et al. 2015). Impacts from changes in ocean temperature or pH specific to fishes such as uku have not been identified, and may be difficult to discern from other impacts. However, regardless of which alternative is selected, monitoring of physical conditions and biological resources by a number of agencies would continue to occur and would allow fishery managers to make adjustments in fishery management regimes in response to changes in the environment or stock status. Attention to trends in fishery performance and appropriate management measures will be key to offsetting negative effects of environmental changes (Gaines et al. 2018). Appropriate fishing mortality controls, such as those proposed here, are a way to mitigate environmental impacts.

The efficacy of the proposed ACLs and AMs in providing for sustainable levels of fishing for bottomfish such as uku is not expected to be adversely affected by changes in environmental conditions. Recent catches relative to OFL estimates and a 2024 stock assessment helped to inform the development of the ACLs and AMs. For the 2030 and 2031 fishing years, the Council and NMFS will use the 2024 stock assessment to inform the development of the ACLs and AMs. NMFS will be developing a new stock assessment that will provide updated information on the uku fishery in 2030 or 2031. Monitoring would continue, and, if monitoring shows overfishing is occurring, ACLs and other fishery management provisions could be adjusted in the future.

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

4.7 Other Actions Including Connected Actions

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

4.8 Summary of Effects

The environmental effects of the six alternatives considered in this EA are summarized in Table 18.

Table 18. Environmental Effects of the Alternatives.

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
Overview of the Alternatives	No ACL or AM.	ACT, ACL, and AMs for commercial and non-commercial catch. Both in-season and post-season AMs. The status quo management (Nadon et al 2020).	ACT, ACL, and AMs for commercial and non-commercial catch. Both in-season and post-season AMs. The status quo management (Nadon et al, 2024).	ACL and AM for commercial and non-commercial catch. Post-season AM only (Nadon 2024).
4.1 Effects on the uku fishery: expected fishery outcome of alternatives	No change to fishery, small chance of exceeding Council recommended ACL.	No change to fishery, small chance of commercial catch exceeding the ACL based on 2020 assessment requiring closure in-season.	No change to fishery, small chance of commercial catch exceeding the ACL based on 2024 assessment requiring closure in-season.	No change to fishery, small chance of commercial catch exceeding the ACL based on 2024 assessment requiring overage adjustment

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
4.1 Effects on the uku fishery: location, gear, participation, effort, seasonality	Approximately two thirds of the total harvest of uku is made in Federal waters across the MHI. Uku is seasonal, with a peak in fishing activity in early summer. Alt. 1 would not result in a change to the fishery with respect to location, gear, seasonality, participation, or intensity. (Section 2.2.1, section 3.1, section 4.1)	Same as Alt. 1, though some uku fishing may shift into State waters near the end of the fishing year in the event that the fishery is closed in Federal waters. (Section 2.2.2, section 3.1, section 4.2)	Same as Alt. 2. (Section 2.2.3, section 3.1, section 4.3)	Same as Alt. 1 (Section 2.2.4, section **Error! Reference source not found.**, section 4.4)
4.2 Physical Resources: air and water quality, noise, and viewplanes	No effect (4.1.1)	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.2 Physical Resources: unique features of the geographic environment	No effect (4.1.1)	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	**Alt. 1. (No action)**	**Alt. 2. (No action; status quo/baseline)**	**Alt. 3 and 5**	**Alt. 4. (Preferred) and 6**
4.3 Biological Resources: target species	No effect or small-scale, short-duration, negligible to minor beneficial effect (4.1.2)	Inconsistent with FEP, same as Alt. 1 (*or whatever it actually is*) (4.2.2)	Commercial and non-commercial catches would be constrained at the ACT in-season and ACL post-season and are expected to remain sustainable.	Commercial and non-commercial catches would be constrained at the ACL post-season and are expected to remain sustainable.
4.3 Biological resources: Deep 7 bottomfish stock	Uku are caught using similar gear to the MHI Deep 7 bottomfish fishery, but in shallower water. Catches of uku do not cause changes to the Deep 7 bottomfish fishery, which is managed under a separate ACL and AMs. The MHI Deep 7 bottomfish fishery is unlikely approach it's ACL.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

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

4.3 Biological resources: protected species	The MHI bottomfish fisheries overlap the range of a number of protected species, which are described in section 3.3.2. The MHI uku fishery would continue to operate within existing ESA and MMPA authorizations. The uku fishery would continue to have a low level of authorized interactions with protected species that are incidental to fishing. A low level of incidental vessel collisions with turtles could occur, and a low level of incidental take (and release) of sharks could occur. The uku fishery, part of the MHI bottomfish fishery, is a Category III fishery under the MMPA (a fishery with a remote likelihood or	Same as Alt. 1. If there was an in-season closure, fishermen may engage in other types of fishing, but this would not cause new adverse effects on listed species that have not already been considered for that fishery.	Same as Alt. 2.	Same as Alt. 2.

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
	no known incidental mortality and serious injury of marine mammals). The fishery is not adversely interacting with seabirds.			
4.3 Biological resources: critical habitat	No change to effects on critical habitat of monk seal or the MHI insular false killer whale DPS.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

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

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
4.4 Socio-economic setting: fishing communities	The affected fishing community is the populated islands of the Hawaiian Archipelago and includes fishermen, vendors, and consumers. Fishing is not expected to change from recent years, so fishing communities would not be affected.	Fishery not likely to close, or would close near the end of the year when other species or fishing areas could be targeted, so no large change expected from Alt. 1.	Fishery not likely to close, so no large change expected from Alt. 1.	Same as Alt. 3.
4.4 Socio-economic setting: public health or safety	Fishery is not causing an adverse effect on public health or safety	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: controversial?	Public participation in the management process to date indicates the action is non-controversial.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: fishery participants	Unlikely to have effects on the human environment.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: subsistence harvest or gathering	The uku fishery does not affect any subsistence harvest or gathering.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
4.4 Socio-economic setting: safety at sea	There are no known safety-at-sea issues in the MHI uku fishery.	The proposed ACL is high enough that a race to fish is not expected so this alternative would not be associated with reducing safety-at-sea in the fishery.	Same as Alt. 2.	Same as Alt. 2.
4.4 Socio-economic setting: revenue	Fishing is expected to continue at levels similar to recent years, and fishermen would realize $446,000 if they catch 92,902 lb and sell 92% of their catch.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: historic sites	No listed sites, and no effects to sites that may be eligible for listing.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.4 Socio-economic setting: scientific, cultural and archaeological resources (e.g., shipwrecks, cultural fishing areas or koa)	Any known unique scientific resources protected from all fishing as State MPAs. There are no known traditional fishing sites in Federal waters. There are no known effects to shipwrecks, as bottomfish fishermen avoid them.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

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

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
4.5 Management setting: precedent for future actions or represent a decision in principle about a future consideration	No. Magnuson-Stevens Act and the Hawaii FEP require that NMFS implement ACLs and AMs for all management unit species. This alternative would not results in significant effects or narrow future options for management.	No. Magnuson-Stevens Act and the Hawaii FEP require that NMFS use BSIA in all management decisions. This alternative would not results in significant effects or narrow future options for management	This alternative would not results in significant effects or narrow future options for management	Same as Alt. 3.
4.5 Management setting: council management activities	The Council would continue to monitor and review uku fish catches at the end of a fishing year in the annual report.	The Council would review uku commercial catches in-season relative to ACL with potential for in-season fishery closure and at the end of a fishing year and consider 3-year average recent catches and determine whether an ACL overage adjustment is required.	Same as Alt. 2	The Council would review uku commercial and non-commercial catches at the end of a fishing year and consider 3-year average recent catches and determine whether an ACL overage adjustment is required.
4.5 Management setting: State management activities:	State would administer the CML and catch reporting programs and would enforce fishery related laws in State waters and on shore.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
4.5 Management setting: complementary Federal and State management	The State does not currently have a catch limit or closure for uku in State waters around Hawaii, but is considering implementing these in the future.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.
4.5 Management setting: fishermen's compliance	Fishermen would comply with State laws regarding commercial marine license to catch fish for sale, reporting requirements, size limits, closed fishing areas.	As Alt. 1, and fishermen would need to learn about the potential for an in-season closure, and comply with the no-retention regulation for uku caught in Federal waters if a closure was implemented.	Same as Alt. 2.	Same as Alt. 1.
4.5 Management setting: enforcement	Enforcement needs would not change.	If the fishery did close in Federal waters during the season, additional resources would be needed to enforce the closure.	Same as Alt. 2.	Same as Alt. 1.
4.6 Other: biodiversity and ecosystem function	Uku fishery at expected levels will not affect the population of uku, and does not have known effects on biodiversity or ecosystem function.	Same as Alt. 1.	Same as Alt. 1.	Same as Alt. 1.

Topic	Alt. 1. (No action)	Alt. 2. (No action; status quo/baseline)	Alt. 3 and 5	Alt. 4. (Preferred) and 6
4.6 Other: unique or unknown risks	Unlikely, but this alternative involves the most uncertainty since the fishery would be unconstrained.	Unlikely given the conservative approach to define the ACL and AMs.	Same as Alt. 2.	Same as Alt. 2.
4.7 Cumulative effects	Over time, continued fishing without ACL or AMs could result in unsustainable fishing because this alternative lacks regulatory authority to ensure fishing does not exceed sustainable levels.	No cumulative effects. Alternative 2 continues management under Magnuson-Stevens Act and Hawaii FEP that has been in place since 2012, and is designed to prevent cumulative effects to target or non-target stocks, maintain continuity for management, and provide continuous benefits for fishing communities.	Same as Alt. 2.	Same as Alt. 2.

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