



WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL

7.C.1(1)
202nd CM

PRELIMINARY DRAFT

**Updating the Acceptable Biological Catch (ABC) and Annual Catch Limits (ACLs) for the
Main Hawaiian Island Uku for Fishing Year 2026 to 2028**

February 18, 2025

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 ACT. If NMFS closes the uku fishery in Federal waters because it is projected to reach an ACL or ACT, the Hawaii DLNR currently does not have the authority to close the uku fishery in State waters.

Authority to enact an in-season fishery closure for uku would have to be enabled through the State administrative rule making process. At this time, the State of Hawaii has not initiated a rulemaking process to enact such a rule. Until such time as the State does, a fishery closure for uku in Federal waters would not restrict fishing and 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. 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. 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 depending on the available data.

1.4 Action Area

The action area is the same as described in the 2021 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 uku stock was neither overfished nor experiencing overfishing in 2023 (Table 1). The OFL was estimated to be at 497-398 thousand pounds 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. 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 pounds.

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)
Prob. 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 catch is generally stable over time, with the average over the last three years being 247,381 pounds. 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%

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

2023	180,545	45,012	225,557	295,419	76.4%
Average₂₁₋₂₃	194,381	52,783	247,381		

Source: WPRFMC (2024).

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.

In the first step, 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.

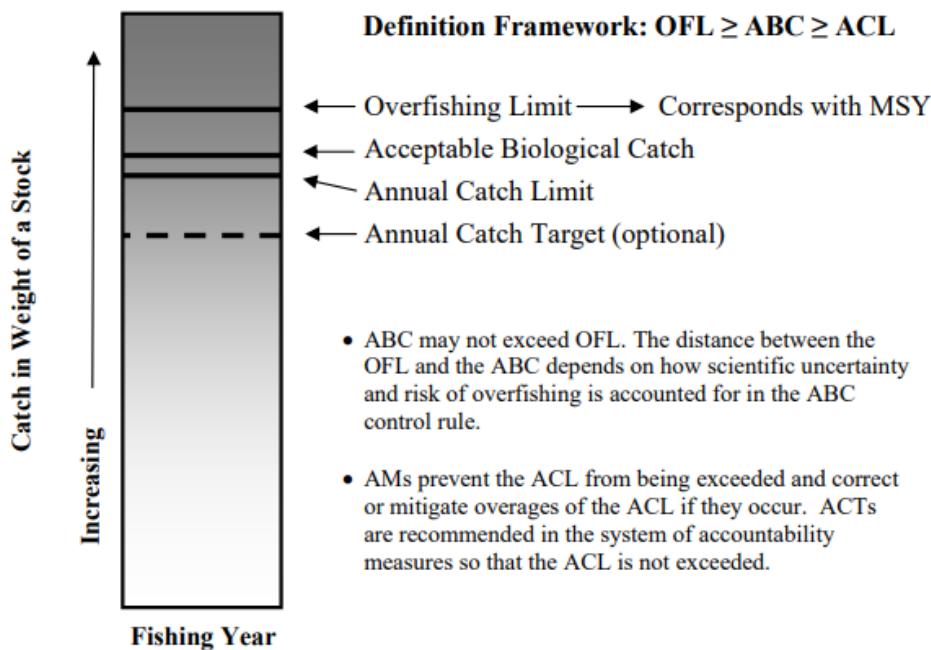


Figure 1. Relationship between OFL, ABC, ACL, and ACT.

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.

1.8 Decisions to be Made

The Council's task is to recommend a preliminary preferred option 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. (Add information to include discussion on AMs and in-season AM.

1.9 List of Preparers

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2 Descriptions of the Options

2.1 Development of the Options

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. 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% to 50% at intervals of 1%. The future catch corresponding to a 50% risk of overfishing can be considered the OFL (Table 3).

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

P*	2026	2027	2028
0.5	467,379	448,420	431,003
0.49	466,498	447,097	429,680
0.48	465,836	445,774	428,358
0.47	464,954	444,451	427,035
0.46	464,073	443,129	425,933
0.45	462,970	441,806	424,610
0.44	461,868	440,704	423,508
0.43	460,986	439,381	422,405
0.42	459,663	438,058	421,082
0.41	458,561	436,956	419,980
0.4	457,238	435,633	418,878
0.39	455,915	434,531	417,775
0.38	454,593	433,208	416,673
0.37	453,270	431,885	415,571
0.36	451,947	430,783	414,469
0.35	450,404	429,460	413,146
0.34	448,861	428,137	412,043
0.33	447,317	426,814	410,941
0.32	445,774	425,492	409,618

P*	2026	2027	2028
0.31	444,010	424,169	408,516
0.3	442,467	422,846	407,193
0.29	440,704	421,523	406,091
0.28	438,940	419,980	404,768
0.27	437,176	418,657	403,445
0.26	435,412	417,114	401,902
0.25	433,428	415,571	400,579
0.24	431,665	413,807	399,036
0.23	429,680	412,264	397,493
0.22	427,696	410,500	395,950
0.21	425,712	408,737	394,407
0.2	423,728	406,752	392,643
0.19	421,744	404,989	391,100
0.18	419,760	403,005	389,115
0.17	417,775	401,020	387,352
0.16	415,571	398,816	385,368
0.15	413,587	396,611	383,383
0.14	411,382	394,407	381,179
0.13	409,398	391,981	379,195
0.12	407,193	389,556	376,770
0.11	404,989	386,911	374,565
0.1	402,784	384,265	372,140

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).

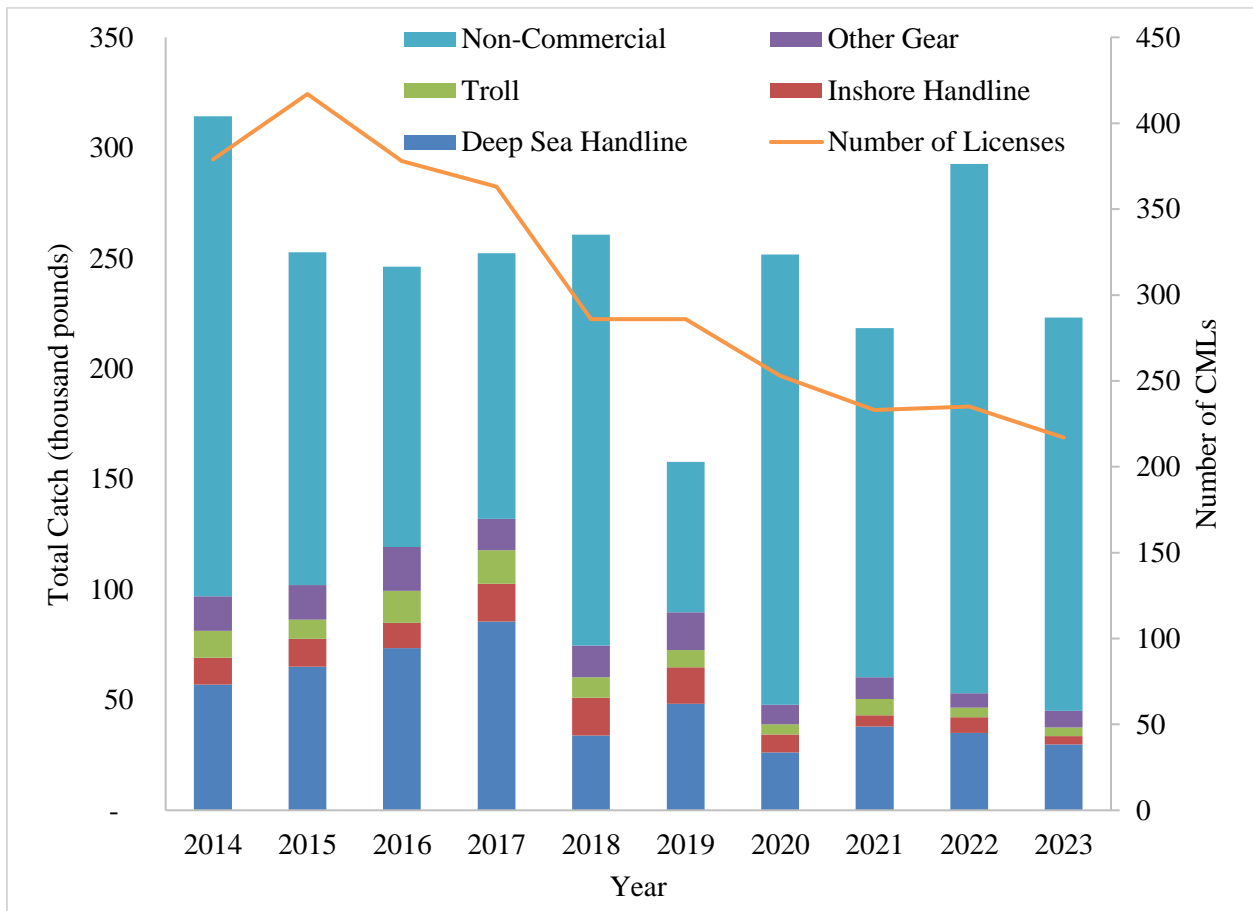


Figure 2. Total commercial landings of uku by gear type from CML reports, estimated total non-commercial landings from HMRFS expansions, and the number of CML holders reporting uku catch in the MHI from 2014 to 2023.

Source: WPFMC (2024).

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 (Table 4). Over the past four years, there has been anywhere between 217 and 253 CML holders participating in the fishery, accounting for a range of 830 to 1,006 trips annually (Table 4).

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	1679	96,893	217,376	79.44	44.04	42.14	40.22
2015	417	1846	101,920	150,796	83.55	36.39	36.88	32.51
2016	378	1914	119,226	126,986	89.25	37.39	57.3	37.16
2017	363	1776	131,947	120,372	94.97	53.32	90.84	40.33
2018	286	1235	74,648	186,070	72.52	63.6	56.09	45.37
2019	286	1295	89,640	68,123	91.36	63.55	37.95	53.62
2020	253	1031	47,796	203,927	64.52	35.73	38.26	32.66
2021	233	1006	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 (WPRFMC 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 (WPRFMC 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 (WPRFMC 2020a).

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

P* Dimensions and Criteria	2020
Assessment Information	-0.7
<i>Reliable catch history</i>	<i>0.5 : unreported and recreational catch</i>
<i>Standardized CPUE</i>	<i>0.0 : improved standardization</i>
<i>Species specific data</i>	<i>0.0 : single species assessment</i>
<i>All sources of mortality accounted for</i>	<i>0.0 : all known uncertainty accounted for</i>
<i>Fishery independent data</i>	<i>0.0 : diver survey data included</i>
<i>Tagging data</i>	<i>1.0 : not included</i>
<i>Spatial analysis</i>	<i>1.0 : not included</i>
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 (WPRFMC 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	<i>-1.0 : average based on social importance</i>
Economic	<i>-0.9 : not specific to a gear type</i>
Ecological	<i>-0.0 : no reduction</i>
Management & Monitoring	<i>-5.1 : uncertainty in complementary management and HMRFS reporting</i>
TOTAL BUFFER	-7.0 :

3 Current Task for the SSC

Setting the Acceptable Biological Catch (ABC)

The SSC’s current task is to specify the ABC for the MHI uku stock for fishing years 2026 through 2028. The ABC may not exceed the projected overfishing limit based on the 2024 stock assessment (Nadon 2024). The Council’s ACL process is described in the Hawaii FEP and includes methods by which the ABC may be reduced from the OFL based on scientific uncertainties through a Risk of Overfishing (P*) Analysis, as described in Section 2.1.3.

3.1 ABC Options for Uku bottomfish

3.1.1 Option 1: No Action – Do not set ABCs

Under Option 1, the SSC would not recommend an ABC for NMFS to specify for MHI uku harvested in fishing years 2026 to 2029. This option would not comply with the Magnuson-Stevens Act (50 CFR 665.4) or the provisions of the Hawaii FEP, which require the Council to specify an ACL for all managed stocks and stock complexes in a fishery. To set the ACL, an ABC is required according to the harvest control rules set forth in the Hawaii FEP. Option 1 serves as an environmental baseline against which other options may be evaluated with respect to environmental impacts.

3.1.2 Option 2: Status Quo – Set ABCs based on the results of the 2020 benchmark stock assessment at 134 mt (297,624 lb) each year

Under Option 2, the SSC would recommend the ABCs for MHI uku be set at 297,624 lb for each fishing year from 2026 to 2028 based on the results of the 2020 benchmark stock assessment (Nadon et al. 2020). Based on the projections from the 2024 stock assessment update, an ABC of 297,624 lb is associated with a risk of overfishing lower than 10 percent. This catch level and those that follow represent catch from the reported commercial and non-commercial catch estimates, consistent with the results of the 2024 stock assessment.

Basing the ABC specification on information from the previous assessment update does not conform with National Standard 2 of the Magnuson-Stevens Act, which requires the use of BSIA for management. This option also utilizes the information from the previous P* working group meeting in 2020 that accounted for the scientific uncertainties following the specification process described in the Hawaii FEP.

This option is more precautionary than the No Action option, which would not specify an ABC.

3.1.3 Option 3: Set ABCs based on the results of the 2024 stock assessment update at P*=43 percent, equivalent to 185.5 mt (408,957 lb) each year

Under Option 3, the SSC would recommend the ABCs for MHI uku be set at 43% risk of overfishing at 408,957 lb for the 2026 to 2029 fishing years based on the results of the 2024 stock assessment update (Nadon 2024). This catch level and those that follow represent catch from the reported commercial and non-commercial catch estimates, consistent with the results of the 2024 stock assessment.

This option is more precautionary than the No Action option and would provide higher flexibility than the Status Quo option. The ABCs under Option 3 are substantially higher than the ABCs under the Option 2. However, the fishery is not likely to reach the ABCs if fishery performance remains similar to the past 10 years. Over the past decade, the fishery has not exceeded any of the MSY values, as participation in the uku fishery has steadily declined.

Using information from the new benchmark assessment is consistent with National Standard 2 of the Magnuson-Stevens Act, which requires the use of the best scientific information available for management. This option also utilizes the information from the 2020 P* working group meeting that accounted for the scientific uncertainties following the process described in the Hawaii FEP.

4 Current Task for the Council

Specifying Annual Catch Limits (ACLs) and Accountability Measures (AMs)

The Council's previous recommendation for the MHI uku fishery included ACLs, ACTs and AMs for fishing years 2022 through 2025. At its 202nd meeting, the Council will consider taking initial action to specify ACLs and AMs for the MHI Uku fishery for fishing years 2026 through 2029. The ACLs can be set equal or below the SSC recommended ABCs. The Council's ACL

process is described in the Hawaii FEP and includes methods by which the ACL may be reduced from the ABC based on social, economic, ecological and management uncertainty through a SEEM Analysis (WPRFMC 2020b), as described in Section 2.1.3.

4.1 ACL Options for MHI Uku

4.1.1 Option 1: No Action – Do not specify ACL or AMs

Under Option 1, the Council may not recommend the specification of ACLs for the MHI uku fishery for fishing years 2026 through 2029. This option 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 option, 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% 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 Option 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.

4.1.2 Option 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 Option 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. 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 5-10 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 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 Option 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 Option 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 pounds, 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.

4.1.3 Option 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 Option 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 SEE analyses for fishing years 2026 through 2029 at 41 percent risk of overfishing. This option 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 Option 3 would operate as described for Option 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 Option 3 would be a substantial increase while maintaining

the same risk of overfishing relative to Option 2. Compared to Option 2, Option 3 is consistent with all requirements of the Magnuson-Stevens Act, the Hawaii FEP, and implementing regulations.

Expected Fishery Outcome

Under Option 3, the fishery could catch up to 406,532 pounds 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 pounds 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.

4.1.4 Option 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 Option 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 as described in Option 2 and 3. However, Option 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 Option 4, the fishery could catch up to 401,020 pounds of uku, which is 111,113 lb more than the ACL for fishing years from 2022 through 2025. However, the ACL under Option 4 is 5,512 lb less than Option 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 pounds 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 our 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.

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

Under Option 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 Option 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%	404,327 (39)	398,816 (34)
ACL at P* and SEE -5%	201,020 (35)	395,509 (31)
ACL at P* and SEE -8%	397,713 (33)	391,981 (28)
ACL at P* and SEE -10%	395,509 (31)	389,556 (26)

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

Expected Fishery Outcome

Under Option 5, the allowable catch would depend on the ACL 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 pounds during the 2014 fishing year, the fishery would remain open throughout each of the next three years.

Compared to Option 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.

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

Under Option 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 Option are 2-10 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 additional measure that the ACL will not be exceeded. Similar to Option 5, this option is more precautionary than Option 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%	398,816 (34)
ACL at P* and SEEM -5%	395,509 (31)
ACL at P* and SEEM -8%	391,981 (28)
ACL at P* and SEEM -10%	389,556 (26)

Expected Fishery Outcome

Under Option 4, the allowable catch would depend on the ACL 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 pounds (Table 4). If the fishery

performs close to the highest recent catch of about 314,269 pounds during the 2014 fishing year, the fishery would remain open throughout each of the next three years.

Compared to Option 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.

5 Summary of New Information for the Impact Analysis

Table 9 summarizes the new information (if any) that can be used to evaluate the impacts of the Options on the potentially affected environment.

Table 9. Summary of new information on environmental impacts of provided options.

New information on physical resources	There is no new information available. The proposed action is not likely to have an adverse impact on the physical environment because bottomfish fishers do not tend to interact with benthic habitat or other facets of the physical environment.
New information on biological resources	The 2024 stock assessment update used a catch-at-age model to obtain a natural mortality estimate to better determine MSST.
<ul style="list-style-type: none"> • Target 	The proposed action will not likely change impacts to target species given that the fishery is highly selective.
<ul style="list-style-type: none"> • Non-target 	The proposed action will not likely change impacts to non-target species given that the fishery is highly selective.
<ul style="list-style-type: none"> • Bycatch 	The proposed action is not likely to change impacts on bycatch, as there is insignificant bycatch in this fishery since it is primarily an artisanal hook and line fishery
<ul style="list-style-type: none"> • Protected species 	The MHI uku fishery is not likely to adversely affect the newly listed oceanic whitetip sharks, nor are they likely to impact insular false killer whale critical habitat. Previous consultations provide evaluations of the impacts of the continued operation of the fisheries other ESA listed species.
<ul style="list-style-type: none"> • Biodiversity and eco-function 	The proposed action will not likely have an adverse effect on biodiversity and ecosystem function since the fishery has been landing well below the proposed ACL since 1990.
New information on socio-economic setting	No new socio-economic information aside from the updated fishing participation data provided in the Hawaii Archipelagic Annual SAFE Report.
New information on management setting	No new information. The proposed action would not impact management in ways not considered in previous environmental assessments.

<ul style="list-style-type: none"> • Marine Protected Areas 	<p>No new information. The proposed action is not likely to adversely affect the MPAs or their management, as the fishery generally occurs outside of MPAs.</p>
<ul style="list-style-type: none"> • EFH/HAPC 	<p>In December 2023, the Council took final action to refine EFH definitions for MHI sub-adult and adult uku by incorporating density and presence-absence data. The proposed action to specify ACLs and AMs for the fishery would not impact designated EFH or HAPC.</p>

6 References

- Hospital J, Schumacher B, Ayers A, Leong K, Severance C. 2019. A Structure and Process for Considering Social, Economic, Ecological, and Management Uncertainty Information in Setting of Annual Catch Limits: SEEM. PIFSC Internal Report IR-19-011.
- Franklin, E. C., Chaloupka, M., Helyer, J. 2024. Western Pacific Stock Assessment Review Panel Summary of “Stock Assessment of Uku (*Aprion virescens*) in Hawaii, 2024 Update. Honolulu: Western Pacific Regional Fishery Management Council.
- Methot, R.D., and Wetzel, C.R. 2013. Stock Synthesis: A biological and statistical framework for fish stock assessment and fishery management. *Fish. Res.* **142**: 86–99. doi:10.1016/j.fishres.2012.10.012.
- Nadon, M.O., M. Sculley, and F. Carvalho. 2020. Stock assessment of uku (*Aprion virescens*) in Hawaii, 2020. U.S. Dept. of Commerce, NOAA Technical Memorandum NOAA-TM-NMFS-PIFSC-100, NOAA PIFSC, Honolulu, HI. 120p.
- Nadon, M.O. 2024. Stock assessment of uku (*Aprion virescens*) in Hawaii, 2024 update. U.S. Dept. of Commerce, NOAA Technical Memorandum NOAA-TM-NMFS-PIFSC-171, NOAA PIFSC, Honolulu, HI. 111p.
- National Academies of Sciences, Engineering, and Medicine (NASEM). 2021. Data and Management Strategies for Recreational Fisheries with Annual Catch Limits. Washington, DC: The National Academies Press. <https://doi.org/10.17226/26185>.
- National Marine Fisheries Service (NMFS). 2021. Final Environmental Assessment Annual Catch Limits and Accountability Measures for Main Hawaiian Islands Uku (Gray Jobfish). NMFS PIRO, Honolulu, HI. December 7, 2021. 89 pp.
- WPRFMC. 2009. Fishery Ecosystem Plan for the Hawaii Archipelago. Honolulu: Western Pacific Regional Fishery Management Council. 220 p.
- WPRFMC. 2024. Annual Stock Assessment and Fishery Evaluation Report for the Hawaii Archipelago Fishery Ecosystem Plan 2023. Remington T, DeMello J, Ishizaki A (Eds.). Honolulu: Western Pacific Regional Fishery Management Council.

WPRFMC. 2020a. Main Hawaiian Island Uku P* Working Group Report. Honolulu: Western Pacific Regional Fishery Management Council.

WPRFMC. 2020b. Main Hawaiian Island Uku SEEM Working Group Report. Honolulu: Western Pacific Regional Fishery Management Council.