



WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL

10.D(1)
152 CM
ACTION ITEM

A Proposed Amendment to the Hawaii Archipelago & Pacific Pelagic Fishery Ecosystem Plans

Management Measures for Federal Fishery Data Collection in the Hawaii Archipelago



WPMR'S WESTERN PACIFIC DAILY LONGLINE FISHING LOG

No.

VESSEL		PERMIT NUMBER		NMFS USE ONLY	
Date of Departure from Port: / /		Port: / /		BL Trip Type: / /	
Date of Return to Port: / /		Port: / /		BL Trip No: / /	
SET INFORMATION				Observer on Board: / /	
DATE OF SET: / /		Target species: () Tuna () Sword () Tuna/Sword/Other			
Number of Hooks Set: /		Length of Mainline Set: / miles		Bait Type: /	
Hooks per Float: /		Number of Lightsticks: /			
BEGIN SET Time: / /		Position: / / N/S Latitude: / / E/W Longitude			
END SET Time: / /		Position: / / N/S Latitude: / / E/W Longitude			
HAUL INFORMATION					
DATE OF HAUL: / /					
BEGIN HAUL Time: / /		Position: / / N/S Latitude: / / E/W Longitude			
END HAUL Time: / /		Position: / / N/S Latitude: / / E/W Longitude			
Number of Hooks Lost: /					
PELAGIC SPECIES			PROTECTED SPECIES		
NUMBER OF FISH			NUMBER RELEASED		
	Kept	Released		Uninjured	Injured / Dead
TUNAS:					
Albacore (round)	75		SEALS:		
Bonito tuna	18		Monk Seal	51	
Yellowfin tuna	17		Sea Lion	72	
Skipjack tuna (aka)	22		Other Seals		
Pinkish tuna	19		DOLPHINS:		
PILCHARD:			Bottlenose	70	
Blue marlin			Spinner	71	
Striped marlin (young)			Other dolphins		
Sailfin			WHALES:		
Spearfish (left)			Hamptons	60	
Spearfish (right)			Fake Killer	52	
Swordfish (circumflex)			Other whales		
Other marlin (specify):			TURTLES:		
OTHER PELAGICS:			Oven	53	
Mahi-mahi	11		Leatherback	54	
Moonfish (spec)	12		Loggerhead	68	
Wahoo (spec)	13		Olive ridley	58	
Offish (spec)	20		Hawksbill	69	
Pomfret (spec)	21		Unidentified hawksbill	65	
Other pelagics (specify):			BIRDS:		
SHARKS:			Black-foot Albatross	73	
Blue shark	7		Laysan Albatross	74	
Shark shark	8		Short-tailed Albatross	75	
Thresher shark	9		Other birds (specify):		
Oceanic white-tip shark	24				
Other Shark (specify):					

I certify that the above information is complete and true to the best of my knowledge.

VESSEL CAPTAIN/OPERATOR: Print name: / /

CMR: / /

Signature: / /

Date: / /

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A Proposed Amendment to the Hawaii Archipelago Fishery Ecosystem Plan

Management Measures for Federal Fishery Data Collection in the Hawaii Archipelago

September 12, 2011

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1.0 Summary

Although some information is available on many of the fisheries under the Council's jurisdiction, detailed information on some of the other fisheries is incomplete. The Magnuson-Stevens Fishery Conservation and Management Act (MSA) defines "fishery" as (A) one or more stocks of fish which can be treated as a unit for purposes of conservation and management and which are identified on the basis of geographical, scientific, technical, recreational, and economic characteristics; and (B) any fishing for such stocks. The Council had recommended, and NMFS implemented, data collection as part of the requirement for permits for most of its fisheries in the EEZ. The data that are collected is vital for fishery scientists to develop stock assessments and provide estimates to managers to develop quotas, catch shares, or annual catch limits. The data also provides a way to monitor the fishery from year to year to ensure that current regulations are working and to see if further regulation (or relaxation of regulations) is needed. However, there remains gaps where data are either not collected or the data collection programs in place may not be sufficient.

The State of Hawaii requires reporting of fishing effort and catch by all commercial fishermen (i.e. those who sell one or more fish during the year) and collects non-commercial fishing information through the Hawaii Marine Recreational Fishery Survey (HMFRRFS). While these programs do collect information from fishermen, there are still some fishermen that may sell their fish and not report, or not report all of their catch for one reason or another.

In Hawaii, the HMRFS program is part of the larger, national Marine Recreational Fishery Statistical Survey (MRFSS), which was found to be deficient in many areas. Currently, MRFSS is being revised by the Marine Recreational Information Program (MRIP) to address these deficiencies, but MRIP has been a long and slow process. A recent review of the HMRFS program data to provide for a correction in the survey's historical estimates was recently completed that states that the new MRIP estimation method developed to correct historic estimates, cannot be used for historic HMRFS data. This is because of differences in HMRFS and the MRFSS program due to differing policies and procedures in practice that deviate from those used in other areas, such as incomplete data forms.

The review of the HMRFS program did provide some key recommendations for improving collection of needed data, but also showed that the HMRFS program is too different from the MRFSS programs being revised through MRIP. The costs of reviewing HMRFS independently and providing improvements need to be weighed against the potential outcomes to determine if the desired end product, a stock assessment usable for creating Annual Catch Limits (ACLs), can be developed more cost effectively than by other methods such as Federal permitting and reporting.

The Western Pacific Regional Fishery Management Council, at its 151st Meeting, recommended developing alternatives to require Federal permitting and reporting for all fisheries in Hawaii that currently do not have Federal permits or reporting requirements. Table 1 lists the fisheries that do not currently have Federal permits. Because the Council has, for the most part, deferred to the State of Hawaii for commercial fishery reporting, those fisheries that would be affected by these regulations would include non-commercial/recreational pelagic fisheries and currently harvested coral reef taxa.

Collecting complete data from the fisheries in the WPR has even greater importance today, as the deadlines for mandates such as ACLs begin to lapse. A range of alternatives are explored in this document (Table 1) for the Council to consider.

Table 1: Summary of Alternatives

Alternative	Description
1	No Action -Continue to collect data under existing programs.
2	Require Federal permits and monthly logbooks for Non-commercial coral reef and pelagic fisheries in the US EEZ around Hawaii -Require Federal permits and catch reports for individual fisheries not currently permitted under Federal law for Hawaii.
3	Require a single non-commercial Federal permit and monthly logbooks for all fisheries in the US EEZ around Hawaii -Require a single Federal permit and catch report for all non-commercial fisheries not currently permitted under Federal law for Hawaii.
4	Require a single Federal permit for owners of vessels that conduct non-commercial fishing in the US EEZ around Hawaii and require catch reports on a per-trip basis -Only vessel owners would be required to apply for and receive a Federal permit and report on a per-trip basis.

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List of Acronyms

ABC	Allowable Biological Catch
ACL	Annual Catch Limit
ACT	Annual Catch Target
CHCRT	Currently Harvested Coral Reef Taxa
CNMI	Commonwealth of the Northern Mariana Islands
DAR	Hawaii Division of Aquatic Resources
EEZ	Exclusive Economic Zone
FFA	Forum Fisheries Agency
FMP	Fishery Management Plan
FEP	Fishery Ecosystem Plan
HMRFS	Hawaii Marine Recreational Fishery Survey
MRFSS	Marine Recreational Fishery Statistical Survey
MRIP	Marine Recreational Information Plan
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MUS	Management Unit Species
NOAA	National Oceanic and Atmospheric Administration
NMFS	National Marine Fisheries Service
NSAR	National Saltwater Angler Registry
PHCRT	Potentially Harvested Coral Reef Taxa
PRIA	Pacific Remote Island Areas
WPacFIN	Western Pacific Fishery Information Network
WPRFMC or Council	Western Pacific Regional Fishery Management Council

2.0 Introduction

The issue of addressing gaps in fishery data collection has been around since the creation of the Western Pacific Regional Fishery Management Council (Council) in 1976 and its associated Fishery Management Plans (FMPs). The Council has continually struggled with addressing these gaps because of a shortage of resources and regional differences. In the Western Pacific Region, there are voluntary creel surveys for American Samoa, Guam and CNMI operated by the local agencies with assistance from the Western Pacific Fisheries Information Network (WPacFIN) with some Federal permits for longlining and bottomfish fishing, and commercial data collection through the markets and fish processors. In Hawaii, there is a mandatory Commercial Marine License (CML) for all of Hawaii's commercial fisheries and a voluntary recreational fishery survey. The differences in the types of data collected and the degree to which the information is provided (voluntary vs mandatory) in the WPR has made it difficult for stock assessments to be developed. In 2002, the Council, at its 122nd Meeting, was presented with options to address the data needs in the region. At that time, the Council decided to let each island area address its own needs in its own matter. In Guam, the Guam Fishermen's Cooperative Association, in conjunction with NOAA Fisheries, the Guam Department of Agriculture and Wildlife Resources, and the Council, developed a voluntary fishermen's survey to capture fishery data; In Hawaii, the Hawaii Marine Recreational Fishery Survey (HMRFS), an offshoot of the NOAA Fisheries Marine Recreational Fisheries Statistical Survey, was re-initiated to capture recreational fishery data; and American Samoa and the Commonwealth of the Northern Mariana Islands (CNMI) continued to rely on their creel surveys administered by WPacFIN.

As recent as its 95th meeting in June 2007, the Council's Scientific and Statistical Committee (SSC) has noted that adequate reporting of catch data are required for management decisions (ACLs, TACs, Quotas, Stock Assessments, etc.). The SSC has also recommended that fish catch be reported in the interest of gaining complete scientific information.

On July 31, 2007, Council staff met with NOAA Fisheries representatives to discuss the needs and issues facing the Western Pacific region's fisheries. At this meeting, NOAA stated that the Council should recommend reporting requirements for all harvests of federally managed species whether they are caught in State or Federal waters with the reason that it will provide comprehensive information regarding catches of these species.

The Council, at its 146th Meeting in October 2009, recommended NMFS, State, and Territory fishery agencies continue to revise existing programs to fill data gaps. In a subsequent Data Workshop held at the Council Office in November 2009, many gaps in the data collection programs were identified, particularly the usefulness of the data for new mandates such as Annual Catch Limits (ACLs) and catch shares.

The requirement for the Council to set ACLs in 2011 has brought about a renewed interest in capturing complete data for the purpose of setting appropriate Allowable Biological Catch by the Council's SSC and subsequent ACLs and/or Annual Catch Targets (ACTs) for each Management Unit Species (MUS) under Federal Management.

At its 151st Meeting in June 2011, the Council directed its staff to draft an amendment to the Hawaii FEP that considers alternatives for non-commercial fishery data collection and recommended including an alternative to require Federal permits for owners of vessels conducting non-commercial fishing in the US EEZ around Hawaii, with a requirement to report fishing catch and effort data on a per-trip basis.

During bottomfish workshops conducted around the State of Hawaii in July and August, the Council held informational sessions to discuss options for collecting non-commercial data in Hawaii. There were very few comments on the options proposed though the general need for data was understood and agreed upon.

3.0 Purpose and Need for Action

The Council has authority over the fisheries in the US Exclusive Economic Zone (EEZ) around the State of Hawaii and provides management recommendations based upon the Fishery Ecosystem Plans (FEPs) implemented by the National Marine Fisheries Service (NMFS). The FEPs contain MUS that should be properly monitored to ensure the sustainability of the fishery.

Although much information is available on major fisheries under the Council's jurisdiction, detailed information on some smaller fisheries is incomplete. For most areas and fisheries under the Council's jurisdiction, a combination of creel surveys (for both commercial and recreational vessels), and various types of dealer reporting systems (for commercial catches only) are used to provide information to fishery managers. In Hawaii, recreational fisheries data are collected through the voluntary HMRFS program and the State requires reporting of fishing effort and catch by all commercial fishermen (i.e. those who sell one or more fish during the year). Some recreational fishery catch is available (Appendix A), however, some of the data are suspect (i.e. HMRFS) and much of the data comes from voluntary surveys.

All of these data collection programs provide basic information used in stock assessments and management decisions. However, there are many gaps in these programs where data are not collected such as the non-commercial sector of the bottomfish and pelagic fisheries using HMRFS in Hawaii. These data gaps include missing information from recreational (i.e. those who fish for sport or pleasure), subsistence (i.e. those who fish for food), and expense (i.e. those who sell fish only to recover their trip expenses) fishermen and it is anticipated that they do not provide the detailed biological, economic, and social information needed to ensure fully informed management decisions. The Hawaii recreational fishery data gap is being addressed through a new Marine Recreational Information Program (MRIP) initiative which would register Federal fishermen and improve the HMRFS survey. These improvements however will take some time and resources to first discover the sources of potential bias and then develop projects to correct the survey.

A better approach may be to have a requirement for the reporting of Federal MUS caught in the Hawaii EEZ. The report would indicate who fished, where they fished, what they fished for (and caught), and their fishing effort or any other information needed. This mandatory requirement would provide the known universe of non-commercial fishermen in Hawaii's EEZ that can be used in the determination of allocation in future management measures.

Recent MSA mandates such as ACLs and the national initiative towards management by catch shares, has increased the need for complete catch data, particularly the missing data from recreational fisheries. Currently, ACLs (and potential catch shares) will be based on data in which there is little confidence and may not provide accurate estimates for sustainable fishing and/or the growth/development of fisheries in the WPR. These ACLs will also require information be provided on the catch and effort to ensure that they are not being exceeded and that Accountability Measures (AM) are properly instituted as needed.

The purpose of these alternatives is to collect complete and accurate fishery data in Hawaii through the requirement of mandatory fishery reporting to assist the Council in making management decisions and developing ACLs. When fisheries managers don't have complete data the fishery will be managed on the data that is available. This can result in overly restrictive management which is wasteful, or it can result in overfishing and declining catches. In either case, fishermen are the losers. It is in the long-term interest of all of the residents of the Western Pacific Region to have complete reports on fishery harvest so that the best data possible is being used to manage our valuable fisheries. These alternatives will provide the information on fisheries in the WPR to develop accurate stock assessments that scientists and managers are confident in to be used for the development of accurate ACLs and provide management measures to keep the fisheries in Hawaii sustainable.

4.0 Objective

The objective of these alternatives is to prevent overfishing and improve fishery management and the accuracy of stock assessments and ACLS through the improved data collection by requiring Federal permits and reporting.

5.0 Description of Alternatives

The following alternatives are proposed for consideration to achieve the objective:

5.1 Alternative 1: No Action

Under this alternative, the Council and NMFS would continue to collect data and information utilizing existing data collection and monitoring programs. Non-commercial data will be collected in Hawaii by HMRFS and revised through potential MRIP improvements.

5.2 Alternative 2: Require Federal permits and monthly logbook for non-commercial coral reef and pelagic fisheries in the US EEZ around Hawaii

This alternative would require NMFS to issue separate non-commercial coral reef and non-commercial pelagic fisheries permits and require a Federal logbook to be provided to NMFS on a monthly-basis for fishing activity occurring in the EEZ around Hawaii.

5.3 Alternative 3: Require a single non-commercial Federal permit and monthly logbook for all fisheries in the US EEZ around Hawaii

Under Alternative 3, NMFS would issue a Non-commercial Federal permit and logbook for any non-commercial fishing activity in the EEZ around Hawaii. The Main Hawaiian Islands Non-commercial Bottomfish permit currently required by NMFS would be discontinued and this fishery would be required to attain this permit. The reporting requirement would continue to be on a monthly basis.

5.4 Alternative 4: Require a single Federal permit for owners of vessels that conduct non-commercial fishing in the US EEZ around Hawaii and require catch reports on a per-trip basis

Under this alternative vessel operators and owners would be required to have a Federal permit and would be responsible for ensuring that Federal catch reports were correctly completed within 24 hours after each fishing trip and transmitted to NMFS within 72 hours after each fishing trip.

6.0 Affected Environment

6.1 Description of the Fisheries

6.1.1 Maximum Sustainable Yield, Optimum Yield, and Status Determination Criteria for Western Pacific Fisheries

Maximum sustainable yield (MSY), optimum yield (OY), status determination criteria (SDC) and other reference points for the fisheries of the Western Pacific Region were described in the Coral Reef Ecosystems FMP (69 FR 8336), Amendment 4 to the Precious Corals FMP (64 FR 19067), Amendment 6 to the Bottomfish FMP (68 FR 46112), Amendment 8 to the Pelagics FMP (68 FR 46112), and Amendment 10 to the Crustaceans FMP (68 FR 46112). These reference points were also incorporated into the FEPs for American Samoa, Hawaii, the Mariana Archipelago, the Pacific Remote Island Areas and western Pacific Pelagic fisheries. In some instances MSY values, were not actually specified for all species as there was a significant lack of data to warrant a reliable estimate or proxy. However, the FEPs include a method based on reproductive potential by which NMFS and the Council can estimate MSY for all managed stocks, when data becomes available. Additionally, estimates of MSY for certain federally managed stocks are updated every few years by NMFS Pacific Islands Fisheries Science Center, the Western and Central Pacific Fisheries Commission, and the Inter-American Tropical Tuna Commission and published as technical reports.

With regards to SDC and overfishing definitions, the FEPs utilize the maximum fishing mortality threshold (MFMT) as its SDC for overfishing because it is based on a long-term average, as opposed to an annual OFL value. The FEPs also utilize minimum stock size threshold (MSST) as the SDC for an overfished determination. The original references for MSY, OY, and SDC processes for western Pacific fisheries that were incorporated into the FEPs for the Hawaii Archipelago and western Pacific pelagic fisheries are as follows:

Reference	Management Unit Species	Section Specifying MSY	Section Specifying OY	Type of SDC Utilized
WPFMC 2002	Bottomfish	4.1.2.2	4.1.1.2	MFMT & MSST
WPFMC 2002	Crustaceans	4.3.2.2	4.3.1.2	MFMT & MSST
WPFMC 2002	Pelagics	4.2.2.2	4.2.1.2	MFMT & MSST
WPFMC 2001	Coral Reef	4.3.3	4.3.3	MFMT & MSST
WPFMC 1998	Precious Corals	4.5.4	4.5.4	MFMT

6.1.2 Description of the Bottomfish Fisheries

The following description of Hawaii's bottomfish and seamount groundfish fisheries is summarized from the Hawaii Archipelago FEP (WPFMC 2009), where additional information and source material can be found.

The deep-slope bottomfish fishery in Hawaii concentrates on species of eteline snappers (e.g., opakapaka), carangids (e.g., jacks), and a single species of grouper concentrated at depths of 30–150 fathoms. The primary target species which share this deepwater habitat have, for management purposes, been termed the “Deep 7” bottomfish species and include: onaga (*Etelis coruscans*), ehu (*Etelis carbunculus*), gindai (*Pristipomoides zonatus*), kalekale (*Pristipomoides sieboldii*), hāpu‘upu‘u (*Epinephelus quernus*), ‘ōpakapaka (*Pristipomoides filamentosus*), and lehi (*Aphareus rutilans*). Other bottomfish species include: uku (*Aprion virscens*), taape (*Lutjanus kasmira*), kahala (*Seriola dumerili*), white ulua (*Caranx ignobilis*), black ulua (*Caranx lugubris*), butaguchi (*Pseudocaranx dentex*) and yellow kalekale (*Pristipomoides auricilla*).

The bottomfish fishery can be divided into two geographical areas: the inhabited main Hawaiian Islands (MHI) with their surrounding reefs and offshore banks, and the Northwestern Hawaiian Islands (NWHI), a chain of largely uninhabited islets, reefs and shoals extending 1,200 nm across the North Pacific. For management purposes, the NWHI is divided into two zones, the Mau Zone that includes the portion of the U.S. EEZ waters around the Hawaii Islands Archipelago that lie between 161° 20' W. long and 165° W. long, and the Hoomalu Zone which includes the portion of EEZ waters located west of 165° W. long. Additionally, at the northern end of the NWHI is the Hancock Seamounts Ecosystem Management Area in which there is currently a moratorium on the harvest of armorhead, raftfish, alfonsin, and other seamount groundfish (75 FR 69015, November 10, 2010).

In the MHI, approximately 47 percent of the bottomfish habitat lies in state waters. Bottomfish fishing grounds within federal waters around the MHI include Middle Bank, most of Penguin Bank, and approximately 45 nautical miles of 100-fathom bottomfish habitat in the Maui–Lanai–Molokai complex. Specific bottomfish fishing locales favored by fishermen vary seasonally according to sea conditions and the availability and price of target species. Historically, Penguin Bank is one of the most important bottomfish fishing grounds in the MHI, as it is the most extensive shallow shelf area in the MHI and within easy reach of major population centers. 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.

In the small-boat bottomfish fishery that is active around the MHI, the distinction between recreational and commercial fishermen is difficult to define because many otherwise-recreational fishermen sell small amounts of their catch to cover trip expenses. With the exception of non-commercial fishing participants fishing in federal waters, the MHI bottomfish fishery is not subject to federal permit or reporting requirements; however, commercial fishermen are required to obtain commercial marine licenses (CML) and submit State catch reports reporting their monthly fishing activity. HDAR catch report forms do not differentiate between state and federal waters, therefore information about catches represents catch from both.

Since 2007, the MHI bottomfish fishery has been managed under a total allowable catch (TAC) limit. The TAC system was triggered by a 2005 review of the status of the fishery which indicated overfishing was occurring on the entire archipelagic-wide multi-stock complex; however, the review determined that the MHI was the area contributing most significantly to the problem, and therefore, where action should be focused. For this reason, the TAC applies only to the MHI bottomfish fishery and only on the component of the fishery that targets deep waterspecies(i.e., the Deep 7 bottomfish). The TAC is set annually based on the best available scientific information and taking into account the associated risk of overfishing. Once the TAC is reached, both commercial and recreational fishing for Deep 7 bottomfish in the MHI is closed. There is no TAC limit for other bottomfish species. Table 2 lists MHI Deep 7 TAC for fishing years between 2007 and 2010.

Table 2. Annual MHI Deep 7 TAC specifications, opening and closing dates of the fishery and final reported landings.

Year	TAC	Open	Close	Final Landing
2007/2008	178,000 lbs ¹	Oct. 1, 2007	April 16, 2008	195,861 lbs
2008/2009	241,000 lbs ²	Nov. 15, 2008	July 6, 2009	258,544 lbs
2009/2010	254,050 lbs ³	Sept. 1, 2009	April 20, 2010	208,000 lbs
2010/2011	254,050 lbs ⁴	Sept. 1, 2010	Ongoing	Yet to be determined

Information Used for Setting TACs

¹ 2006 Stock Assessment/Amendment 14 (Moffitt et al. 2006)

² 2008 Stock Assessment from PIFSC (Brodziak et al. 2008)

³ 2009 Stock Assessment from PIFSC (Brodziak et al. 2009)

⁴ Based on 2009 Stock Assessment from PIFSC (Brodziak et al. 2009), adjusted for 2009-2010 final landing

In the NWHI, the bottomfish fishery, when it operated, occurred exclusively in federal waters; between 2000 and 2005, the NWHI accounted for nearly one third of the bottomfish caught in the state of Hawaii. However, since the establishment of the Papahānaumokuākea Marine National Monument in 2006, bottomfish landings have continually declined as fishermen left the fishery. As of 2010, the NWHI portion of the fishery no longer exists due to completion of a voluntary capacity reduction program (74 FR 47119, September 15, 2009) created by Congress as a result of the establishment of the monument. However, there are areas outside of the monument where bottomfish habitat exists and fishing could be conducted when and if fishing regulations are changed to allow it. Table 3 lists total bottomfish landings from the NWHI during the last five years of the fishery.

Table 3. NWHI 2005-2009 BMUS (x 1000 pounds)

Species	2005	2006	2007	2008	2009
Onaga	28	30	31	35	3
Opakapaka	24	18	20	11	5
Ehu	10	6	4	4	>1
Uku	83	90	91	55	25
Hapuupuu	37	21	19	13	6
Butaguchi	12	9	11	5	3
White Ulua	1	2	4	1	>1
Other BMUS	6	4	5	3	1
TOTAL	201	180	185	127	45

Source: NMFS unpublished data.

Hawaii seamount groundfish are comprised of three species found primarily on Hancock Seamounts located in the NWHI and include pelagic armorhead (*Pseudopentaceros wheeleri*) alfonsin (*Beryx splendens*), and raftfish (*Hyperoglyphe japonica*). While no domestic fishery has ever targeted seamount groundfish, foreign vessels harvested pelagic armorhead prior to the passage of the MSA and depleted the stock throughout its range. To aid in the recovery of armorhead, the Council recommended and NMFS implemented a moratorium prohibiting fishing for all seamount groundfish and bottomfish at Hancock Seamounts. The moratorium has been in place since 1986 and is proposed to remain indefinitely until armorhead stocks are determined to be rebuilt (75 FR 69015, November 10, 2010).

6.1.3 Description of the Crustacean Fisheries

A detailed description of the crustacean fishery is summarized in the Hawaii Archipelago FEP (WPFMC 2009) where additional information and source materials can be found. This has been supplemented here with more recent catch data. Catch information regarding crustaceans in state and federal waters around the MHI is limited to commercial catches, as there are no federal or state reporting requirements for recreational fishery participants.

Landings of Kona crabs, spiny and slipper lobsters and deep water *Heterocarpus* shrimps are shown in Figures 7-10, segregated by landings from state and federal waters. Kona crab landings have ranged from around 6,000 – 31,000 pounds (mean = 17,000 pounds) with 30-75% of landings being made from the EEZ or federal waters. Between 30 and 78 commercial fishermen annually reported landing Kona crabs between 1994 and 2009. Spiny lobster and slipper lobster catches were almost entirely confined to production from State waters between 1994 and 2009. Spiny lobster production ranged from just over 1,300 pounds to about 12,000 pounds (mean = 8,200 pounds) over this time period, while slipper lobster landings were modest, ranging from about 40-900 pounds (mean = 215 lb). Between 16 and 61 commercial fishermen reported landing spiny lobsters between 1994 and 2009, while 4-12 commercial fishermen reported slipper lobster landings in the same period. Two federal permits were also issued by NMFS for lobster fishing in EEZ waters around the MHI in 2007.

Eight species of deepwater shrimp in the genus *Heterocarpus* have been reported throughout the tropical Pacific (*Heterocarpus ensifer*, *H. laevigatus*, *H. sibogae*, *H. gibbosus*, *H. lepidus*, *H.*

dorsalis, *H. tricarinatus* and *H. longirostris*). These shrimp are generally found at depths of 200 to 1,200 meters on the outer reef slopes that surround islands and deepwater banks. Species distribution tends to be stratified by depth with some overlap. The deepwater trap fisheries have primarily targeted *Heterocarpus ensifer* and *H. laevisgatus*. Western Pacific commercial trap fisheries for deepwater shrimp are intermittent. There have been sporadic operations in Hawaii since the 1960s. The fisheries have been unregulated, and there has been no comprehensive collection of information about the fisheries. Most of these fishing ventures have been short-lived, probably as a result of sometimes-frequent loss of traps, a shrimp product with a short shelf life and history of inconsistent quality, and the rapid localized depletion of deepwater shrimp stocks leading to low catch rates.

Fishing for deepwater shrimp has been highly sporadic over the last several decades. In 1984, a total of 17 vessels reported catching approximately 159 tons of deepwater shrimp worth an estimated ex-vessel value of \$780,000 across all western Pacific fisheries for *Heterocarpus*. Hawaii landings have ranged from about 10,000 to 185,000 pounds between 1994 and 2009, with a mean of the years that fishing took place of about 56,200 pounds. Apart from one year (1997), production of deep water shrimps has been confined to the EEZ.

Figure 1. Landings of Kona crab in Hawaii 1994-2009, from State and Federal waters.

Source HDAR

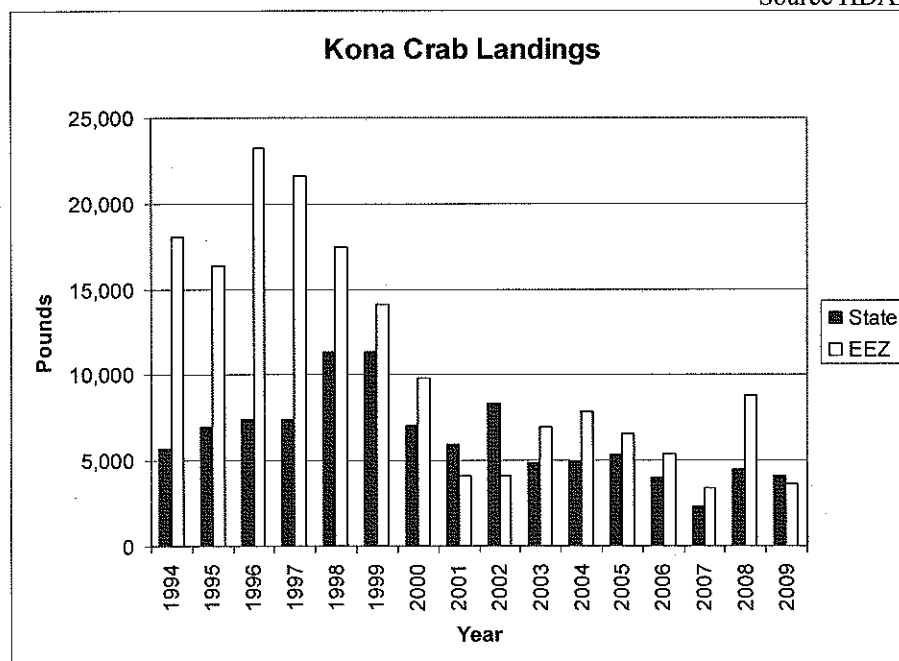


Figure 2. Landings of spiny lobster in Hawaii 1994-2009, from State and Federal waters.

Source HDAR

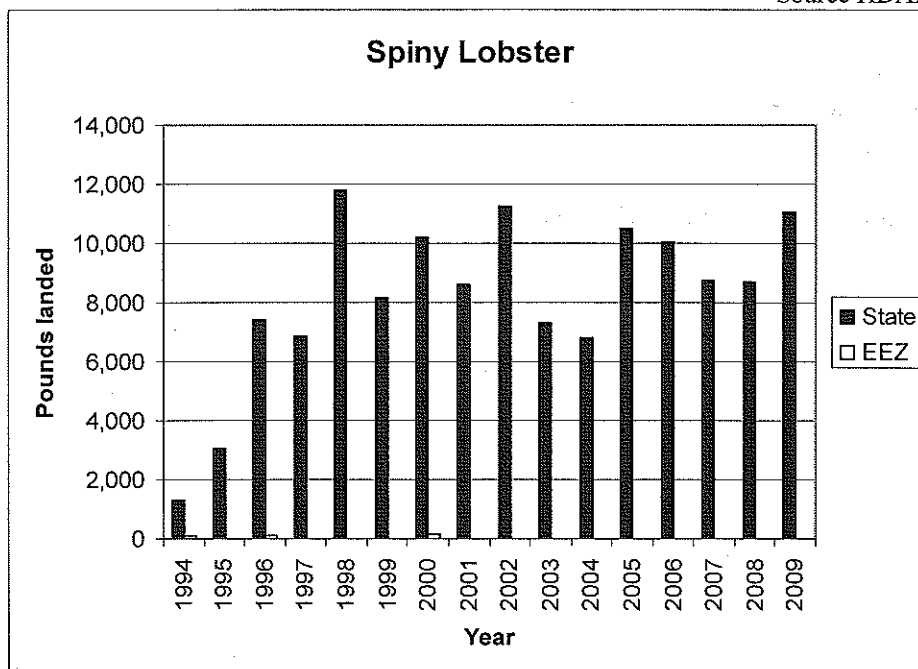
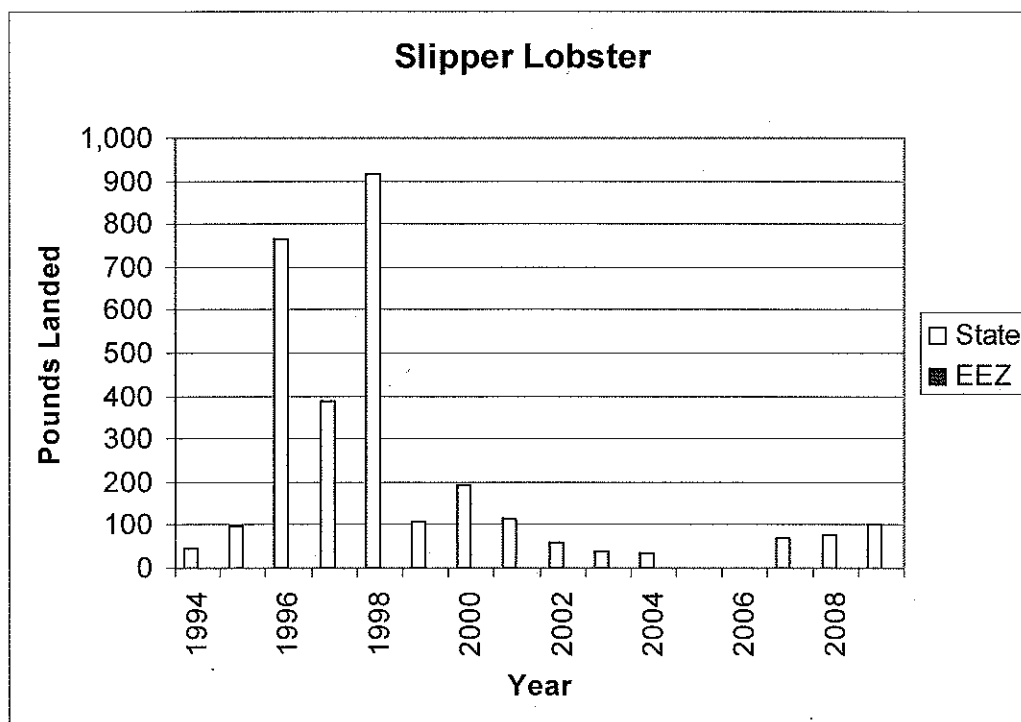


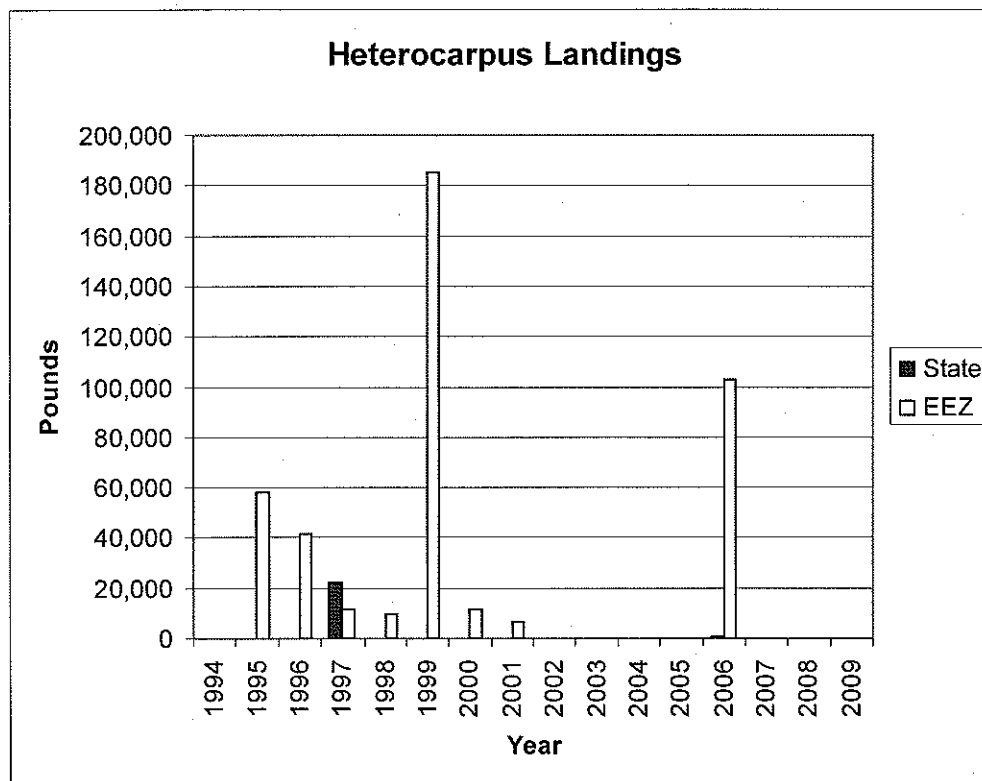
Figure 3. Landings of slipper lobster in Hawaii 1994-2009, from State and Federal waters.



Source: HDAR

Figure 4. Landings of deep water *Heterocarpus* shrimp in Hawaii 1994-2009, from State and Federal waters.

Source: HDAR



6.1.4 Description of the Precious Coral Fisheries

The following precious coral fishery description is summarized from the Hawaii Archipelago FEP (WPFMC 2009). Source material for information and figures can be found in WPFMC 2009; additional citations below are not found in WPFMC 2009. The ongoing collection of black coral from depths of 30–100 meters by scuba divers has continued in Hawaii since the late 1950s, although harvest levels have fluctuated with changes in demand. Since 1980, virtually all of the black coral harvested around the Hawaiian Islands has been taken by hand from a bed located in the Auau Channel. Most of the harvest has come from State of Hawaii waters; however, a portion of the black coral bed in the Auau Channel is located in the EEZ. In 1999, concern about the potential for greater harvesting pressure on the black coral resources led the State of Hawaii to prohibit the harvest of black coral with a base diameter of less than 3/4 inches from state waters. Between 1990 and 1997, the annual harvest of black coral in Hawaii varied from a low of 864 pounds to a high of 6,017 pounds, with a yearly average of 3,084 pounds (Table 16). Landings and ex-vessel revenues of the black corals recently harvested in Hawaii cannot be presented due to the low number of active harvesting operations (less than three); however, current precious coral harvest is below MSY. For the years 1999-2005, the total harvest of black coral is between 52,000-55,000 pounds (Figure 5; WPFMC 2006) with average yearly landings of about 7500 pounds (Figure ; WPFMC 2006), which is below the 25% reduction on MSY (WPFMC 2006). There has, however, been a doubling in landings from the

prior 1992-1998 period attributed to increased demand, improved detailed bathymetric maps, and adoption of GPS (WPFMC 2006). There is no known recreational component to this fishery.

Figure 5. Summary of black coral landings from 1985-2005 (WPFMC 2006)

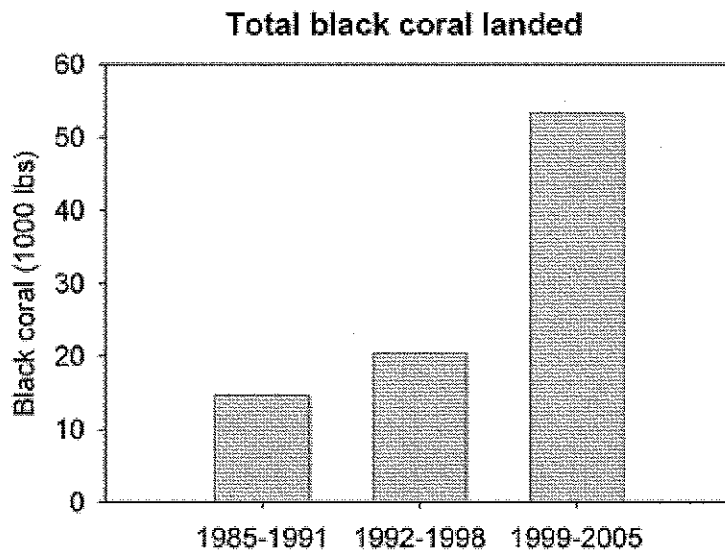
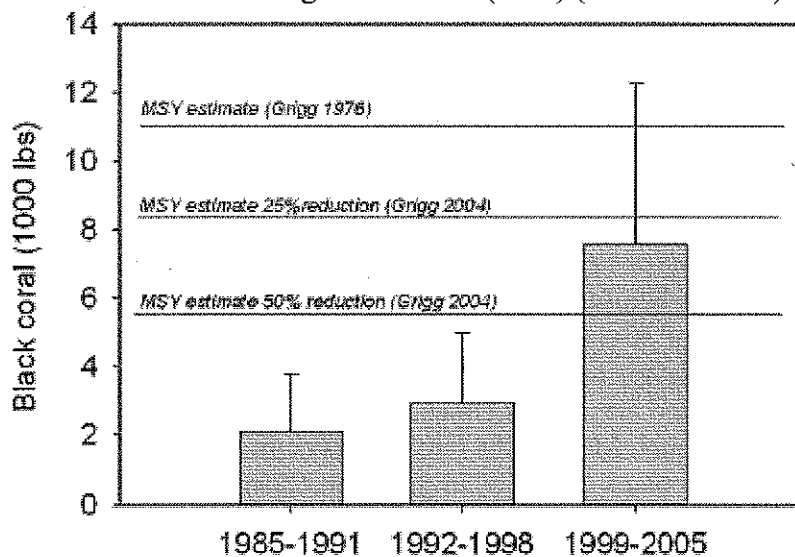


Figure 6. Mean annual black coral landings 1985-2005 (w/sd) (WPFMC 2008)



After two decades of minimal activity, the domestic fishery for pink, gold, and bamboo precious corals in the EEZ of Hawaii resumed in December 1999. One company used two one-man submersibles to survey and harvest pink and gold corals at depths between 400–500 meters during 1999 and 2001. However, they did not continue their operations after that time. As with black corals, actual harvests cannot be reported because there are less than three participants.

6.1.5 Description of the Coral Reef Ecosystem Fisheries

The following information is summarized from the Hawaii Archipelago FEP (WPFMC 2009), where additional information and source material can be found. Coral reef taxa are currently harvested primarily in Hawaii State waters. No permits for collection of potentially-harvested coral reef taxa (PHCRT) in federal waters have yet been issued, thus there appears to be no fishery for PHCRT. Due to the establishment of the Papahānaumokuākea Marine National Monument, there are no active coral reef fisheries in the NWHI. The majority of the total commercial catch of inshore fishes, invertebrates, and seaweed comes from nearshore reef areas around the MHI; however, harvests of some currently-harvested coral reef taxa (CHCRT) also occur in federal waters (e.g., around Penguin Bank). As illustrated in **Error! Reference source not found.**, total catches of coral reef ecosystems species are dominated by bigeye scad and mackerel scad, and variations in their harvests have largely driven the downward trend observed in the 2000-2005 time period. Other species reported by commercial fishermen include surgeonfishes, goatfishes, squirrelfishes and parrotfishes.

In recent decades, there has been a reported decline in nearshore fishery resources in the MHI. Excessive fishing is considered to be one of the major causes of this decline. Coastal construction, sedimentation, and other effects of urbanization have also caused extensive damage to coral reefs and benthic habitat near the populated islands.

Because HDAR's catch forms use reporting grids that do not differentiate between state and federal waters, these data are for all (state and federal) waters surrounding the Hawaii Archipelago. Information on the number of fishery participants is unavailable. With the exception of the FEP's special permit requirement, there are no reporting requirements for recreational and other non-commercial catches from waters around the Hawaii Archipelago, but creel surveys at Kaneohe, Hanalei, and Hilo Bays suggest that these catches are at least equivalent to the reported commercial catch, and may be two or three times greater. The majority of these catches is believed to be from State waters and would thus not be managed by the Hawaii Archipelago FEP; however, the ecosystem approach would warrant consideration of inshore fisheries and stocks as they interrelate with those in Federal waters.

Table 4: MHI Top Ten Catches of Coral Reef Associated Species 2000-2005

	2000	2001	2002	2003	2004	2005	AVG
Bigeye scad (akule)	1,105,273	729,985	614,306	501,220	743,052	656,434	725,045
Mackerel scad	269,799	215,010	331,939	365,707	260,362	232,714	279,255
Surgeon/tangs	98,625	118,841	133,517	124,251	95,138	94,495	110,811
Goatfish	40,220	43,122	68,061	64,239	69,556	42,034	54,539
Squirrelfish	38,548	52,235	53,650	47,154	41,059	37,928	45,096
Parrotfish	29,084	26,656	50,174	70,363	35,374	33,111	40,794
Octopus	23,736	28,985	27,698	26,336	23,115	24,244	25,686
Rudderfish	14,004	16,313	32,102	24,214	23,573	20,417	21,771
Pig-lipped ulua	43,900	36,204	35,836	27,454	29,092	14,959	31,241
Invertebrates	12,780	19,050	11,813	7,697	15,149	11,668	13,026
Algae	10,680	16,882	9,570	13,410	16,864	10,399	12,968

Source: WPacFin, accessed March 2007 (cited from WPFMC 2009)

6.1.6 Hawaii-based Pelagic Fisheries

Hawaii's pelagic fisheries are small in comparison to other Pacific Ocean pelagic fisheries such as distant-water purse seine fisheries and other foreign pelagic longline fisheries, but they comprise the largest fishery sector in the State of Hawaii. Tuna, billfish and other tropical pelagic species supply most of the fresh pelagic fish consumed in Hawaii and support popular recreational fisheries. Hawaii-based longline vessels are capable of traveling long distances to high-seas fishing grounds, while the smaller handline, troll, charter and pole-and-line fisheries—which may be commercial, recreational or subsistence—generally occur within 25 miles of land, with trips lasting only one day.

Hawaii's pelagic fisheries—which include the longline, Main Hawaiian Islands troll and handline, offshore handline, and the aku boat (pole and line) fisheries—are the State's largest and most valuable fishery sector (Table 5), unpublished data prepared for 2009 pelagics annual report). The majority of the commercial landings and revenue come from the longline fishery, although the majority of State Commercial Marine License (CML) holders (who are required to report all catch) are fishermen on small vessels using trolling gear.

Table 5. Hawaii commercial pelagic landings, revenue, and average price by fishery

Fishery	2008			2009		
	Pounds Landed (1000 lbs)	Ex-vessel Revenue (\$1000)	Average Price (\$/lb)	Pounds Landed (1000 lbs)	Ex-vessel Revenue (\$1000)	Average Price (\$/lb)
Longline	26,694	\$73,769	\$2.90	22,145	\$57,918	\$2.68
MHI trolling	2,971	\$5,623	\$2.48	2,958	\$5,198	\$2.39
MHI Handline	697	\$1,447	\$2.50	1,080	\$1,860	\$2.05
Offshore Handline	325	\$595	\$2.37	286	\$569	\$2.09
Aku boat	703	\$889	\$1.27	511	\$679	\$1.33
Other Gear	311	\$680	\$2.39	168	\$316	\$2.06
Total	31,702	\$83,003	\$2.81	27,148	\$66,541	\$2.60

The target species are tunas and billfishes, but a variety of other species are also important including mahimahi, ono (wahoo), opah (moonfish), and monchong (pomfret) among others.

Error! Reference source not found., prepared for the 2009 pelagics annual report, presents an overview of Hawaii's commercial pelagic landings, and their values, for the years 2008 and 2009. Collectively, these pelagic catches amounted to landings of approximately 27 million pounds with an estimated ex-vessel value of nearly \$66.5 million in 2009.

The largest component of pelagic catch in recent years is bigeye tuna. Swordfish was the largest component of the billfish catch in 2008 and 2009, followed by blue marlin. Mahimahi and opah were the largest components of the "other PMUS" category.

Table 6: Hawaii Commercial Pelagic Catch, 2008-2009

Species	2008			2009		
	Pounds Landed (1000 lbs)	Ex-vessel Revenue (\$1000)	Average Price (\$/lb)	Pounds Landed (1000 lbs)	Ex-vessel Revenue (\$1000)	Average Price (\$/lb)
Tuna PMUS						
Albacore	874	\$1,380	\$ 1.72	678	\$1,071	\$ 1.65
Bigeye Tuna	13,571	\$51,006	\$ 3.81	10,753	\$39,366	\$ 3.66
Bluefin Tuna	1	\$0	--	2	\$0	--
Skipjack Tuna	1,279	\$1,221	\$ 1.34	1,098	\$1,010	\$ 1.42
Yellowfin Tuna	3,536	\$8,891	\$ 2.77	2,844	\$6,249	\$ 2.52
Tuna PMUS subtotal	19,260	\$62,497	\$3.42	15,375	\$47,696	\$3.27
Billfish PMUS						
Swordfish	4,316	\$7,363	\$ 1.92	3,975	\$7,256	\$ 1.89
Blue Marlin	1,161	\$1,047	\$ 1.14	1,154	\$1,193	\$ 1.16
Striped Marlin	1,023	\$1,076	\$ 1.05	644	\$947	\$ 1.47
Other Billfish	566	\$386	\$ 0.73	296	\$295	\$ 1.04
Billfish PMUS subtotal	7,067	\$9,872	\$1.57	6,070	\$9,691	\$1.54
Other PMUS						
Mahimahi	1,432	\$3,268	\$ 2.61	1,464	\$2,853	\$ 2.22
Ono (wahoo)	976	\$2,296	\$ 2.69	751	\$1,673	\$ 2.77
Opah (moonfish)	1,335	\$2,225	\$ 1.72	1,896	\$2,376	\$ 1.28
Oilfish	491	\$942	\$ 1.92	544	\$704	\$ 1.29
Pomfret	677	\$1,709	\$ 2.55	628	\$1,381	\$ 2.20
Sharks (whole weight)	416	\$154	\$ 0.45	373	\$139	\$ 0.47
Other Pelagics	47	\$40	\$ 1.11	46	\$29	\$ 1.15
Other PMUS subtotal	5,375	\$10,634	\$2.15	5,703	\$9,154	\$1.75
Total Pelagics	31,702	\$83,003	\$2.81	27,148	\$66,541	\$2.57

Recreational fishery

There are no state or federal permit or reporting requirements for recreational participants (those who do not sell a single fish during the year), therefore, catch rates and effort data are unknown. However in 2001, NMFS in conjunction with HDAR resumed its voluntary Marine Recreational Fishing Statistics Survey (MRFSS) program in Hawaii. Also newly instituted are associated voluntary creel surveys (the Hawaii Marine Recreational Fishing Survey or HMRFS) to determine catch rates and species composition. The results from these two surveys are then combined to yield estimates of recreational catch and effort by both shore and land based fishermen. Limited final species specific estimates of recreational fishing have been informally released, although there is still some question as to whether or not these fishers are purely recreational (fishing for sport or pleasure with no sales), "subsistence" (fishing primarily for food) or "expense" (selling just enough to cover trip costs).

The total number of recreational fishers in Hawaii is unknown but there are about 14,300 small vessels in Hawaii, of which about 90 percent are registered as "pleasure craft" of which 6,600 might be used for recreational fishing. The data indicate that little to no bigeye tuna is caught by recreational fishers, while yellowfin landings have been estimated to range between 2,270 and 5,050 t, with a three year mean of 3,295 t. Due to criticisms of the sampling methods and statistical algorithms employed to develop recreational catch totals, the Council has recommended that HMRFS catch estimates not be used for management purposes until the issues have been resolved.

Hawaii's charter fisheries primarily troll for billfish. Big game sportfishing rods and reels are used, with four to six lines trolled at any time with outriggers. Both artificial and natural baits are used. In addition to lures, trollers occasionally use freshly caught skipjack tuna and small yellowfin tuna as live bait to attract marlin, the favored landings for charter vessels, as well as yellowfin tuna. Appendix A provides a review of the pelagic recreational fishery from the 2009 Pelagics Annual Report.

Domestic High Seas Squid Jigging Fishery

This fishery has recently been conducted by a single operation which uses four catcher vessels and one large mothership. These vessels operate under HSFCA permits and visit ports at Honolulu, Hawaii and in Alaska. Each vessel carries 21-38 jigging machines and fishes primarily to the north of the Hawaiian Archipelago targeting neon flying squids (*Ommastrephes bartrami*) seasonally during the summer months. See the FEIS written for Amendment 12 to the Pelagic Fishery Plan for a detailed description of these squid and the fishery (NMFS 2005).

6.2 Data Collection Programs in Hawaii

Table 8 illustrates the data collection systems in place for fisheries based in the western Pacific region. Fisheries that do not require Federal permits or data collection are presented in bold.

Table 7: Federal Permitting and Reporting Requirements for Fishermen in Hawaii

Area and MUS by Fishery	Federal permit required for fishing in EEZ?	Federal logbook required for fishing in EEZ?	License or Reporting Required in Local Jurisdiction?
Bottomfish MUS	Commercial-No Non-Commercial-Yes	NWHI-No <i>All others-Yes</i>	NWHI-Yes Commercial-Yes Non-comm-No
Coral Reef MUS	PHCRT-Yes CHCRT-No	PHCRT-Yes CHCRT-No	Commercial-Yes Recreational- some through HMRFS
Crustaceans MUS	Yes	Yes	Commercial-Yes Recreational- some through HMRFS
Precious Corals MUS	Yes	Yes	Commercial-Yes

Area and MUS by Fishery	Federal permit required for fishing in EEZ?	Federal logbook required for fishing in EEZ?	License or Reporting Required in Local Jurisdiction?
			<i>Recreational-some through HMRFS</i>
Pelagic MUS	<i>Longline-Yes Others-No</i>	<i>Longline-Yes Others-No</i>	<i>Commercial-Yes Recreational-some through HMRFS</i>

6.2.1 Hawaii Marine Recreational Fisheries Survey (HMRFS)

The Hawaii Marine Recreational Fisheries Survey (HMRFS) is a State of Hawaii project funded by the National Marine Fisheries Service to collect marine recreational fishery data in Hawaii. This survey is a locally-based program based upon the national Marine Recreational Fisheries Statistical Survey (MRFSS) that has been in existence in other parts of the U.S. since 1979. The MRFSS program also started in Hawaii in that year, but lasted only two more years due to funding and staffing restrictions (Ma et. al, 2011). In 2001, MRFSS was returned to Hawaii due to the work of the Council's Recreational Data Task Force and its Chairman, Richard Shiroma, this time being managed by the State of Hawaii, and reinstituted as HMRFS.

HMRFS is conducted similarly to MRFSS, in that, it contains two basic components: 1) an access point angler intercept survey for catch data from shore and private/rental boats; and 2) a coastal household telephone survey for information on shore and private/rental boat fishing efforts. MRFSS differs in that it also conducts an angler intercept survey and a for-hire survey, but in Hawaii the for-hire/charter fishery is considered a commercial fishery and is therefore required to report their catch to the state of Hawaii via its Commercial Marine Licensing (CML) program.

The HMRFS survey samples in two-month periods (called waves). In the phone survey, callers sample of households by telephone and ask if anyone in the household went fishing, how they fished (from shore or by boat), what method/gear was used, and how many trips were taken/hours were expended. In the angler intercept survey, surveyors are sent to boat ramps, harbors and shoreline sites that are picked out randomly (based on the sample design which takes into account fishing pressure so that the highest pressure sites are sampled more often) and collect data from fishermen that volunteer to participate. Fishermen are asked for the information on the method they are using, their effort, and the species caught, and are asked for length and weight measurements. Data from the telephone survey is combined with data from the intercept survey to provide estimates of effort of catch and effort by species.

A review of the MRFSS sampling methods was completed in 2006 and identified possible sources of bias in both the telephone and angler intercept surveys (NRC 2006). These biases included anglers not residing in coastal households, the lack of intercepts at survey off-hours

(night) and the lack of access to private fishing sites, harbors, and marinas. The result was an overhaul of the MRFSS program and the development of the Marine Recreational Information Program (MRIP) and the National Saltwater Angler Registry (NSAR). MRIP has initiated projects to address these biases, and the NSAR hopes to address the telephone survey issues by developing a “phonebook” of recreational saltwater anglers so these anglers can be targeted, improving precision.

Table 8 below provides a look at the 2010 data for Hawaii’s top recreational species as reported in the Fisheries of the United States, 2010 (NMFS 2011, data from NMFS Office of Science and Technology). The Proportional Standard Error (PSE) expresses the standard error of an estimate as a percentage of the estimate and is a measure of precision. Large PSEs indicate high variability around estimates and therefore low precision. There is also a direct relationship between precision and sample size. The weight estimates are minimums and may not reflect the actual total weight landed or harvested.

Table 8: Estimated Recreational Marine Catch and Weight of Top Species in Hawaii for 2010 (excluding Akule and Opelu)

(source: NMFS 2011 and NMFS Office of Science and Technology, www.st.nmfs.noaa.gov)

Species	Total Catch	PSE	Weight (lbs)	PSE
Yellowfin Tuna (Ahi)	302,730	17.3	8,916,214	26.4
Skipjack Tuna (Aku)	288,556	15.6	1,640,200	17.4
Convict Tang (Manini)	252,557	46.4	61,998	57.5
Hawaiian Flagtail (Aholehole)	229,805	21.8	5,390	0
Bluefin Trevally (Omilu)	173,796	13.9	214,475	23.4
Dolphinfish (Mahimahi)	163,722	20.1	2,524,243	20.1
Wahoo (Ono)	40,750	13.7	821,762	15.3
Pink Snapper	115,003	30.1	419,866	33.7
Blue Marlin (Au)	1,253	42.4	220,597	0

Note: Top five species by catch for 2010 are: Yellowfin Tuna, Skipjack Tuna, Convict Tang, Hawaiian Flagtail, and Bluefin Trevally. Top species by weight are Yellowfin Tuna, Dolphinfish, Skipjack tuna, Wahoo, Pink Snapper and Blue Marlin (NMFS 2011).

7.0 Environmental Consequences

This section describes impacts of the alternatives on the affected environment, fishing communities, and protected resources, as well as potential impacts to other fisheries ecosystem components.

7.1 Alternative 1: No Action

7.1.1 Target Species

Under the no-action alternative, information on non-commercial catch and effort would continue to be collected through the HMRFS program only. Currently, this data is not used by fishery scientists and managers to monitor non-commercial fisheries in Hawaii. Annual Catch Limits developed by the Council to prevent overfishing would continue to be based upon commercial catch and effort data only.

7.1.2 Non-target Species

Non-commercial fishermen, in general, are expected to have less targeting skill than commercial fishermen, and therefore may have higher non-target catches. They should, however, be less influenced by market value and therefore may be expected to retain more non-target species than commercial fishermen. However, under this alternative, the amount of non-target species caught and the effort expended by non-commercial fishermen would only be counted by the HMRFS program.

7.1.3 Protected Species

The protected species resources that may interact with federal fisheries include certain species of sea turtles, marine mammals, and seabirds, such as green, leatherback and loggerhead sea turtles, humpback whales, false killer whales, and Laysan and blackfooted albatross (see the FEPs, WPFMC 2009, for a full list of protected resources). The fisheries of the western Pacific region have been evaluated for impacts on protected resources and are managed in compliance with the requirements of the MSA, the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the Migratory Bird Treaty Act, and other laws and policies. Detailed descriptions of potentially affected resources and interactions with federal fisheries can be found in each FEP (WPFMC 2009) and the impacts of those fisheries on the resources are contained in biological opinions associated with fishery management actions (Table). The Council, through various management measures, has reduced the likelihood, number, and severity of interactions with protected resources.

Table 9: Most Recent ESA Section 7 Consultations for Fisheries Managed under the Hawaii Archipelago and Pelagics FEPs

Fishery		Consultation
Hawaii		
○ Main Hawaiian Islands (MHI) bottomfish		March 18, 2008, Biological Opinion
○ Northwestern Hawaiian Islands (NWHI) Mau Zone bottomfish		March 8, 2002, Biological Opinion
○ NWHI Ho'omalū Zone bottomfish		March 8, 2002, Biological Opinion
○ Coral reef		March 7 2002, Letter of Concurrence
○ Precious corals		December 20, 2000, Letter of Concurrence
○ MHI crustaceans		April 4, 2008, Letter of Concurrence
○ NWHI crustaceans (no current fishery)		May 24, 1996, Biological Opinion
Western Pacific Pelagic Fisheries		
○ Hawaii deep-set longline		October 4, 2005, Biological Opinion
○ Hawaii shallow-set longline		October 15, 2008, Biological Opinion
○ Hawaii pole-and-line		August 21, 2008, Letter of Concurrence
○ American Samoa longline		September 16, 2010, Biological Opinion
○ Western Pacific troll and handline		September 1, 2009, Biological Opinion
○ Western Pacific squid jig		July 16, 2008, Letter of Concurrence

None of the affected fisheries are currently operating in areas designated as critical habitat for listed species that are listed as threatened or endangered under the ESA. NMFS is currently working on proposed revisions to Hawaiian monk seal critical habitat and is also evaluating whether to revise the ESA listing status of the loggerhead sea turtle. Additionally, NMFS has recently proposed to list the false killer whale and is currently evaluating whether to list the bumphead parrotfish and a number of coral species under the ESA.

Under Alternative 1, there is no change being made to the operation of the non-commercial fisheries in Hawaii, thus no protected resources will be negatively impacted. This alternative does not, however, provide for additional data collection on protected resource interactions by non-commercial fishermen.

7.1.4 EFH, Biodiversity, and Ecosystems

Alternative 1 does not adversely impact EFH as there would be no change in the current non-commercial fisheries in Hawaii. This alternative may, however, impact the understanding of the ecosystems in Hawaii and the biodiversity of the fisheries due to the lack of data collection from the non-commercial fisheries.

7.1.5 Fishery Sectors

The commercial fishery could potentially be impacted by Alternative 1 by having ACLs set at a level that may not be reflective of the stock abundance or stock status due to the lack of non-commercial fishery data collection. The ACL is set using stock assessments that use estimates of non-commercial fishery participation, catch and effort. A refining of the stock assessment using real non-commercial fishery data could provide a more accurate assessment, thereby producing a more accurate ACL. It is unknown whether this ACL would be set higher or lower (it would depend on the data collected), but if the ACL was higher, the commercial fishery would benefit from additional fish to catch, and if the ACL was lower, the commercial fishery would still benefit as the protection of the stock would ensure sustainability of the resource and the fishery.

The non-commercial fishery would not be burdened under this alternative to attain a Federal permit or provide catch reports. Similar to the commercial fishery, the non-commercial fishery may be impacted as ACLs would also close the non-commercial fishery when the limit is reached. Improved stock assessments, and therefore accurate ACLs, using non-commercial data would also provide the non-commercial fishery an opportunity to either continue fishing or end earlier to ensure sustainability of the resource and fishery.

7.1.6 Fishing Communities

Alternative 1 is not expected to result in significant or disproportionate negative impacts on fishing communities throughout Hawaii as no action would be taken.

7.1.7 Native Hawaiian Community

Alternative 1 is not expected to result in impacts to the Native Hawaiian community as no action would be taken.

7.1.8 Administration and Enforcement

This alternative would not require an increase in administration of permits or logbooks nor an increase in enforcement of additional regulations.

7.2 Alternative 2: Require Federal permits and monthly logbook for non-commercial coral reef and pelagic fisheries in the US EEZ around Hawaii

7.2.1 Target Species

Required reporting by non-commercial fishermen under Alternative 2 would provide information on their catch (including discards) and effort. These data are not currently collected, and thus, fishery scientists and managers would improve the scientific understanding of influences on

Hawaii's stocks and would allow fishery managers to calculate and track a non-commercial portion of the overall ACL for a given fishery.

ACLs established by the Council would be relied upon to prevent overfishing of these species. The ACLs will be tracked using the State of Hawaii's commercial marine license reporting system as well as catch data submitted by non-commercial fishery participants via this permit. For pelagic species without ACLs, the data can be used to inform region-wide stock assessments being developed by Regional Fishery Management Organizations (RFMO) on Highly-Migratory Species (HMS).

7.2.2 Non-target Species

Non-commercial fishermen, in general, are expected to have less targeting skill than commercial fishermen, and therefore may have higher non-target catches. They should, however, be less influenced by market value and therefore may be expected to retain more non-target species than commercial fishermen.

Required reporting (including information on non-target catches and bycatch) by non-commercial fishermen under Alternative 2 would improve the scientific understanding of influences on non-target stocks and would be expected to improve fishery management.

7.2.3 Protected Species

This alternative would not have a direct effect on protected resources or existing critical habitat designations because the proposed action is administrative and will not result in changes to the way any fishery is conducted.

7.2.4 EFH, Biodiversity, and Ecosystems

This alternative is not expected to adversely affect EFH or HAPC as the inclusion of permit requirements do not present impacts beyond the current impacts of the non-commercial coral reef and pelagic fishery.

7.2.5 Fishery Sectors

The commercial fishery would not be affected by Alternative 2, as the requirement for permits and reporting would be limited to non-commercial fishery participants only.

Alternative 2 would require the catch of all non-commercial coral reef and non-commercial pelagic species on all trips to be reported and would provide comprehensive information on the fishing activities of these vessels. This would provide information on non-commercial catches of coral reef and pelagic MUS and would be expected to improve fishery and stock assessments. This alternative would affect the non-commercial coral reef and non-commercial pelagic fishery participants as each and every participant in these fisheries would be required to have a Federal permit. This would facilitate their being granted access rights if the fishery eventually becomes a limited access fishery, or being granted quota share if the fishery is eventually managed under individual fishing quotas. Requiring that every participant have a Federal permit would provide a comprehensive list of potential participants; although not all will necessarily be active. This would meet the requirements of the reauthorized MSA to establish a registry of all recreational fishery participants and would allow for the wide distribution of relevant fishery or regulatory information. These permits could also be made a pre-requisite for non-commercial bag limits.

This alternative would have the largest burden of all alternatives on fishery participants and administrators, as separate permits would need to be issued for each participant in the non-commercial coral reef and non-commercial pelagic fisheries. Based on available information, 475,000 marine recreational fishers were estimated to participate in Hawaii's recreational fisheries in 2010 (NMFS 2011), which is believed to be the upper bound limit for the non-commercial fishery in Hawaii. Coral reef and pelagic species made up the top-four species in number of fish caught in 2010, while pelagic species made up five of the top-six species harvested by weight in Hawaii's recreational fishery (NMFS 2011). The National Saltwater Angler Registry, meanwhile, has issued only 2,380 permits in 2010, although it is believed that this is the lower bound limit for the non-commercial fishery sector in Hawaii and it is somewhere between this and the higher number of estimated recreational fishers.

7.2.6 Fishing Communities

Alternative 2 is not expected to result in significant or disproportionate negative impacts on fishing communities throughout Hawaii; rather, they would all be impacted evenly.

7.2.7 Native Hawaiian Community

Alternative 2 could adversely impact Native Hawaiians who regularly practice their tradition and culture, particularly fishing for coral reef and pelagic species. Those Native Hawaiians who mostly rely on subsistence practices, including fishing, to feed their families, share with their community and supplement their income; the fee for a Federal permit may be a burden. The burden would increase with this alternative, as two separate permits would be required.

For Native Hawaiians, who once exercised sovereignty and self-determination in the Hawaiian Archipelago, and whose activities were governed by customary and traditional practices, any curtailment or reduction of access rights and cultural practices reduces their ability to practice and continue their culture. The loss of any customary access and practice could be viewed as a permanent loss of culture for Native Hawaiian communities. On the other hand, the objective of permitting is to prevent overfishing, thereby ensuring a sustainable resource. In the long-term, a sustainable and accessible fishery resource would provide positive impacts to Native Hawaiians as compared to the current situation.

7.2.8 Administration and Enforcement

Administration and enforcement of Alternative 2 would require the implementation of Federal permit and reporting requirements for non-commercial participants of the coral reef and pelagic fisheries in the EEZ around Hawaii. Using the high and low estimates of non-commercial fishery participants from NMFS, it is estimated that there would be between 2,380 and 475,000 participants in 2010 who would be required to obtain permits under this alternative. It is unknown how many inactive participants would also apply for permits under this alternative. NMFS estimated the cost of administering the permit program for the MHI Non-commercial Bottomfish permit at \$600 K, so implementing two separate permit programs would increase this estimate considerably.

Alternative 2 would also increase administrative costs to process each monthly logbook required for each participant. At a single-logbook per estimated participant, a range of 2,380 – 475,000 logbooks could be required to be processed per month. PIFSC estimated that it would cost \$1.37 M to process 10,500 new catch reports per year for the MHI Non-commercial Bottomfish Permit,

so estimated costs could range into the millions as well. The implementation of electronic or web-based reporting could reduce the administrative burden of this alternative.

Enforcement of this alternative would not include additional at-sea enforcement, although the USCG would be required to check for non-commercial permits during routine boardings of fishing vessels. NMFS SAC PID OLE may require additional personnel and equipment to provide the shore-side enforcement component.

7.3 Alternative 3: Require a single non-commercial Federal permit and monthly logbook for all fisheries in the US EEZ around Hawaii

7.3.1 Target Species

Required reporting by non-commercial fishermen under Alternative 3 would provide information on their catch (including discards) and effort. These data are not currently collected, and thus, fishery scientists and managers would improve the scientific understanding of influences on Hawaii's stocks and would allow fishery managers to calculate and track a non-commercial portion of the overall ACL for a given fishery.

ACLs established by the Council would be relied upon to prevent overfishing of these species. The ACLs will be tracked using the State of Hawaii's commercial marine license reporting system as well as catch data submitted by non-commercial fishery participants via this permit. For pelagic species without ACLs, the data can be used to inform region-wide stock assessments being developed by Regional Fishery Management Organizations (RFMO) on Highly-Migratory Species (HMS).

7.3.2 Non-target Species

Non-commercial fishermen, in general, are expected to have less targeting skill than commercial fishermen, and therefore may have higher non-target catches. They should, however, be less influenced by market value and therefore may be expected to retain more non-target species than commercial fishermen.

Required reporting (including information on non-target catches and bycatch) by non-commercial fishermen under Alternative 3 would improve the scientific understanding of influences on non-target stocks and would be expected to improve fishery management.

7.3.3 Protected Species

This alternative would not have a direct effect on protected resources or existing critical habitat designations because the proposed action is administrative and will not result in changes to the way any fishery is conducted.

7.3.4 EFH, Biodiversity, and Ecosystems

This alternative is not expected to adversely affect EFH or HAPC as the inclusion of permit requirements do not present impacts beyond the current impacts of the non-commercial coral reef and pelagic fishery.

7.3.5 Fishery Sectors

The commercial fishery would not be affected by Alternative 3, as the requirement for permits and reporting would be limited to non-commercial fishery participants only.

Similar to Alternative 2, this alternative would require the catch of all non-commercial coral reef and non-commercial pelagic species on all trips to be reported and would provide comprehensive information on the fishing activities of these vessels. This would provide information on non-commercial catches of coral reef and pelagic MUS and would be expected to improve fishery and stock assessments. This alternative would affect the non-commercial coral reef and non-commercial pelagic fishery participants as each and every participant in these fisheries would be required to have a Federal permit. This would facilitate their being granted access rights if the fishery eventually becomes a limited access fishery, or being granted quota share if the fishery is eventually managed under individual fishing quotas. Requiring that every participant have a Federal permit would provide a comprehensive list of potential participants; although not all will necessarily be active. This would meet the requirements of the reauthorized MSA to establish a registry of all recreational fishery participants and would allow for the wide distribution of relevant fishery or regulatory information. These permits could also be made a pre-requisite for non-commercial bag limits.

This alternative would have the largest burden of all alternatives on fishery participants and administrators, as separate permits would need to be issued for each participant in the non-commercial coral reef and non-commercial pelagic fisheries. Based on available information, 475,000 marine recreational fishers were estimated to participate in Hawaii's recreational fisheries in 2010 (NMFS 2011), which is believed to be the upper bound limit for the non-commercial fishery in Hawaii. Coral reef and pelagic species made up the top-four species in number of fish caught in 2010, while pelagic species made up five of the top-six species harvested by weight in Hawaii's recreational fishery (NMFS 2011). The National Saltwater Angler Registry, meanwhile, has issued only 2,380 permits in 2010, although it is believed that this is the lower bound limit for the non-commercial fishery sector in Hawaii and it is somewhere between this and the higher number of estimated recreational fishers.

7.3.6 Fishing Communities

Alternative 3 is not expected to result in significant or disproportionate negative impacts on fishing communities throughout Hawaii; rather, they would all be impacted evenly.

7.3.7 Native Hawaiian Community

Alternative 3 could adversely impact Native Hawaiians who regularly practice their tradition and culture, particularly fishing for coral reef and pelagic species. For those Native Hawaiians who mostly rely on subsistence practices, including fishing, to feed their families, share with their community and supplement their income, the fee for a Federal permit may be a burden. The burden would be less than alternative 2 as only one permit would be required.

For Native Hawaiians, who once exercised sovereignty and self-determination in the Hawaiian Archipelago, and whose activities were governed by customary and traditional practices, any curtailment or reduction of access rights and cultural practices reduces their ability to practice and continue their culture. The loss of any customary access and practice could be viewed as a permanent loss of culture for Native Hawaiian communities. On the other hand, the objective of

permitting is to prevent overfishing, thereby ensuring a sustainable resource. In the long-term, a sustainable and accessible fishery resource would provide positive impacts to Native Hawaiians as compared to the current situation.

7.3.8 Administration and Enforcement

Administration and enforcement of Alternative 3 would require the implementation of Federal permit and reporting requirements for non-commercial participants of the coral reef and pelagic fisheries in the EEZ around Hawaii. Using the high and low estimates of non-commercial fishery participants from NMFS, it is estimated that there would be between 2,380 and 475,000 participants in 2010 who would be required to obtain permits under this alternative. It is unknown how many inactive participants would also apply for permits under this alternative. NMFS estimated the cost of administering the permit program for the MHI Non-commercial Bottomfish permit at \$600 K, so implementing two separate permit programs would increase this estimate considerably.

Alternative 3 would also increase administrative costs to process each monthly logbook required for each participant. At a single-logbook per estimated participant, a range of 2,380 – 475,000 logbooks could be required to be processed per month. PIFSC estimated that it would cost \$1.37M to process 10,500 new catch reports per year for the MHI Non-commercial Bottomfish Permit, so estimated costs could range into the millions as well. A single permit (versus two separate permits in Alternative 2), provides for less administrative costs and burden. The implementation of electronic or web-based reporting could reduce the administrative burden of this alternative.

Enforcement of this alternative would not include additional at-sea enforcement, although the USCG would be required to check for non-commercial permits during routine boarding of fishing vessels. NMFS SAC PID OLE may require additional personnel and equipment to provide the shore-side enforcement component. A single-permit reduces impacts to enforcement as one permit can be checked instead of multiple.

7.4 Alternative 4: Require a single Federal permit for owners of vessels that conduct non-commercial fishing in the US EEZ around Hawaii and require catch reports on a per-trip basis

7.4.1 Target Species

Alternative 4 would require reporting by non-commercial fishermen to provide information on their catch (including discards) and effort. These data are not currently collected, and thus, fishery scientists and managers would improve the scientific understanding of influences on Hawaii's stocks and would allow fishery managers to calculate and track a non-commercial portion of the overall ACL for a given fishery.

ACLs established by the Council would be relied upon to prevent overfishing of these species. The ACLs will be tracked using the State of Hawaii's commercial marine license reporting system as well as catch data submitted by non-commercial fishery participants via this permit. For pelagic species without ACLs, the data can be used to inform region-wide stock assessments being developed by Regional Fishery Management Organizations (RFMO) on Highly-Migratory Species (HMS).

This alternative proposes to permit vessel owners and not anglers. The vessel owner would also be responsible for reporting the catch and effort on a per-trip basis. This provides a single source for catch and effort information where individual anglers may provide duplicate information from the same trip. By requiring reporting on a per-trip basis, this alternative would provide near-real-time data available for accurate catch monitoring for ACLs and quota-based management. Knowing what was caught on a per-trip, rather than a monthly basis, would allow for a more accurate assessment of the fishery and predictions for possible closure.

7.4.2 Non-target Species

Non-commercial fishermen, in general, are expected to have less targeting skill than commercial fishermen, and therefore may have higher non-target catches. They should, however, be less influenced by market value and therefore may be expected to retain more non-target species than commercial fishermen.

Required reporting (including information on non-target catches and bycatch) by non-commercial fishermen/vessel owners under Alternative 4 would improve the scientific understanding of influences on non-target stocks and would be expected to improve fishery management. It would also provide information on a timely basis for ACLs and other management tools, similar to those for target species.

7.4.3 Protected Species

This alternative would not have a direct effect on protected resources or existing critical habitat designations because the proposed action is administrative and will not result in changes to the way any fishery is conducted.

7.4.4 EFH, Biodiversity, and Ecosystems

This alternative is not expected to adversely affect EFH or HAPC as the inclusion of permit requirements do not present impacts beyond the current impacts of the non-commercial coral reef and pelagic fishery.

7.4.5 Fishery Sectors

Under Alternative 4, only vessel owners would be required to have a Federal permit. Vessel operators and owners would be responsible for ensuring that catch reports were correctly completed and transmitted to NMFS. This would ensure that a responsible party was present on each fishing trip. It would also provide fishery participants who do not own vessels a mechanism by which to officially record their participation. This would facilitate their being granted access rights if the fishery eventually becomes a limited access fishery, or being granted quota share if the fishery is eventually managed under individual fishing quotas. Requiring that every participant have a Federal permit would provide a comprehensive list of potential participants; although not all will necessarily be active. This would meet the requirements of the reauthorized MSA to establish a registry of all recreational fishery participants and would allow for the wide distribution of relevant fishery or regulatory information. These permits could also be made a pre-requisite for non-commercial bag limits.

The commercial fishery would not be affected by Alternative 4, as the requirement for permits and reporting would be limited to non-commercial fishery participants only.

7.4.6 Fishing Communities

Alternative 4 is not expected to result in significant or disproportionate negative impacts on fishing communities throughout Hawaii; rather, they would all be impacted evenly.

7.4.7 Native Hawaiian Community

Alternative 4 could adversely impact Native Hawaiians who regularly practice their tradition and culture, particularly fishing for coral reef and pelagic species. For those Native Hawaiians who mostly rely on subsistence practices, including fishing, to feed their families, share with their community and supplement their income, the fee for a Federal permit may be a burden. The burden would be lessened with requiring vessel owners to obtain permits and provide reports instead of individual anglers.

For Native Hawaiians, who once exercised sovereignty and self-determination in the Hawaiian Archipelago, and whose activities were governed by customary and traditional practices, any curtailment or reduction of access rights and cultural practices reduces their ability to practice and continue their culture. The loss of any customary access and practice could be viewed as a permanent loss of culture for Native Hawaiian communities. On the other hand, the objective of permitting is to prevent overfishing, thereby ensuring a sustainable resource. In the long-term, a sustainable and accessible fishery resource would provide positive impacts to Native Hawaiians as compared to the current situation.

7.4.8 Administration and Enforcement

Administration and enforcement of Alternative 4 would require the implementation of Federal permit and reporting requirements for owners of vessels in the non-commercial coral reef and pelagic fisheries in the EEZ around Hawaii. Instead of requiring each angler to obtain a permit and provide catch reports, this alternative proposes to use owners of vessels. According to the State of Hawaii Data Book (DBEDT 2011), there were 14,847 registered vessels in Hawaii in 2010, of which only 346 were registered as being used for commercial fishing, and 16 for charter fishing. There were 13,667 vessels registered as being used for pleasure. With the State of Hawaii's Commercial Marine License registering 3,373 commercial fishermen, the estimates of vessel owners participating in the non-commercial fisheries in Hawaii are more in the range of 10,000 participants. This is more easily manageable than the range of 2,380 to 475,000 estimated participants in the previous alternatives.

The processing of the logbooks would be done on a per-trip basis, rather than monthly, requiring a larger administrative cost than it would for a monthly logbook. PIFSC estimated that it would cost \$1.37M to process 10,500 new catch reports per year for the MHI Non-commercial Bottomfish Permit, so estimated costs could range into the millions as well. A single permit (versus two separate permits in Alternative 2), provides for less administrative costs and burden, however per-trip reporting would increase those estimated costs. The implementation of electronic or web-based reporting could reduce the administrative burden of this alternative.

Enforcement of this alternative would not include additional at-sea enforcement, although the USCG would be required to check for non-commercial permits during routine boarding of fishing vessels. NMFS SAC PID OLE may require additional personnel and equipment to provide the shore-side enforcement component. A single-permit reduces impacts to enforcement

as one permit can be checked instead of multiple and requiring a vessel owner to produce this permit would reduce burden on USCG or OLE from having to check with each angler.

8.0 Consistency with Applicable Laws

8.1 Magnuson-Stevens Fishery Conservation and Mangement Act

8.1.1 National Standards

Section 301 of the Magnuson-Stevens Act requires that regulations implementing any FMP or amendment be consistent with the ten national standards listed below (to be completed upon selection of preferred alternative).

National Standard 1 states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

National Standard 2 states that conservation and management measures shall be based upon the best scientific information available.

National Standard 3 states that, to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

National Standard 4 states that conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

National Standard 5 states that conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

National Standard 6 states that conservation and management action shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources and catches.

National Standard 7 states that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

National Standard 8 states that conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and 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.

National Standard 9 states that conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided minimize the mortality of such bycatch.

National Standard 10 states that conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

8.2 National Environmental Policy Act

NOAA Administrative Order (NAO) 216-6, Environmental Review Procedures, requires all proposed agency actions be reviewed with respect to environmental consequences on the human environment in accordance with the National Environmental Policy Act (NEPA). This proposed amendment to the Council's Hawaii Archipelago and Pacific Pelagic FEPs is being written and organized to meet both the requirements of the Magnuson-Stevens Fisheries Conservation and Management Act and NEPA.

8.3 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) requires a determination that a recommended management measure has no effect on the land, water uses, or natural resources of the coastal zone or is consistent to the maximum extent practicable with an affected state's enforceable coastal zone management program. A copy of this document will be submitted to the appropriate state government agencies in Hawaii for review and concurrence with the preliminary determination that the preferred alternatives are consistent, to the maximum extent practicable, with their respective coastal zone management programs. The proposed mechanism is administrative and will not result in changes to any fishery.

8.4 Endangered Species Act

The Endangered Species Act (ESA) provides for the protection and conservation of threatened and endangered species. Section 7(a)(2) of the ESA requires federal agencies to ensure that any action authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species.

The proposed action does not modify vessel operations or other aspects of any fishery. Therefore, the proposed action is not likely to jeopardize the continued existence of any listed species or adversely affect any of their critical habitats.

8.5 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) prohibits, with certain exceptions, the take of marine mammals in the U.S. and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States. Under section 118 of the MMPA, NMFS must publish, at least annually, a List of Fisheries that classifies U.S. commercial fisheries into one of three categories. These categories are based on the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. Specifically, the MMPA mandates that each fishery be classified according to whether it has a frequent, occasional, or remote likelihood of-, or no-known, incidental mortality or serious injury of marine mammals.

The 2011 List of Fisheries (LOF) published by NMFS on November 8, 2010 (75 FR 68468). The proposed action does not modify vessel operations or other aspects of any fishery. Therefore, the proposed action is not expected to affect any marine mammal population or habitats in a manner that has not been previously assessed and analyzed by NMFS.

8.6 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act (PRA) is to minimize the paperwork burden on the public resulting from the collection of information by or for the Federal government. It is intended to ensure the information collected under the proposed action is needed and is collected in an efficient manner (44 U.S.C. 3501(1)). The proposed action would establish new permitting and reporting requirements and would therefore be subject to the provisions of the PRA.

8.7 Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) (5 U.S.C. 601 *et seq.*) requires government agencies to assess and present the impact of their regulatory actions on small entities including small businesses, small organizations, and small governmental jurisdictions. The assessment is done by preparing an Initial Regulatory Flexibility Analysis when impacts are expected. The purpose and need for action is described in Section 3.0. Section 5.0 describes the management alternatives considered to meet the purpose and need for action. Section 6.0 provides a description of the fisheries that may be affected by this action and Section 7.0 analyzes environmental impacts of the alternatives considered.

An initial regulatory flexibility analysis will be required and will need to be prepared.

8.8 Administrative Procedures Act

All federal rulemaking is governed under the provisions of the Administrative Procedures Act (APA) (5 U.S.C. Subchapter II) which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the APA, NMFS is required to publish notification of proposed rules in the Federal Register and to solicit, consider and respond to public comment on those rules before they are finalized. The APA also establishes a 30-day wait period from the time a final rule is published until it becomes effective, with rare exceptions. This amendment complies with the provisions of the APA through the Council's extensive use of public meetings, requests for comments, and consideration of comments. The notice of availability and proposed rule associated with this amendment will also include requests for public comments.

8.9 Executive Order 12866

To meet the requirements of Executive Order 12866 (E.O. 12866), NMFS requires that a Regulatory Impact Review (RIR) be prepared for all regulatory actions that are of public interest. This review provides an overview of the problem, policy objectives, and anticipated impacts of regulatory actions, and ensures that management alternatives are systematically and comprehensively evaluated such that the public welfare can be enhanced in the most efficient and cost effective way.

An RIR will need to be developed to analyze potential economic impacts.

8.10 Executive Order 12898

E.O. 12898 requires that a federal agency incorporate environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Northern Mariana Islands. A memorandum by President Clinton, which accompanied E.O. 12898, made it clear that environmental justice should be considered when conducting NEPA analyses by stating the following: "Each federal agency should analyze the environmental effects, including human health, economic, and social effects of federal actions, including effects on minority populations, low-income populations, and Indian tribes, when such analysis is required by NEPA."

The proposed action is not expected to disproportionately impact human health or the environment because the action is administrative in nature.

8.11 Information Quality Act

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

The document was prepared by Council staff based on information provided by NMFS Pacific Islands Fisheries Science Center (PIFSC) and NMFS Pacific Islands Regional Office (PIRO) and after providing opportunities for members of the public to comment at the Council meetings listed in Section 2.0. Additional comments on the document may be received during the comment period for the proposed rule. The process of public review of this document provides an opportunity for comments on the information contained in this document, as well as for the provisions of additional information.

9.0 Proposed Regulations

Title 50, Chapter VI, Part 665 to be amended as follows:

665.14 – Reporting and Recordkeeping

(Remove (2)Iii) and replace with text below)

(ii) If fishing was authorized under a permit pursuant to the HI non-commercial permit under §§665.203, 665.224, or 665.801, the vessel owner must submit the original logbook form for each day of fishing to the Regional Administrator within 72 hours of the end of each fishing trip.

Subpart C: Hawaii Fisheries

665.203 – Permits

(Remove existing (2) and replace with (2) below)

(2) HI non-commercial. The owner of a vessel that is used for non-commercial, vessel-based fishing, landing, or transshipment of Hawaii bottomfish MUS MUS in the EEZ around the Hawaiian Archipelago is required to obtain a HI non-commercial permit or a State of Hawaii Commercial Marine License. If one or more persons on a vessel-based fishing trip holds an HI non-commercial permit, then the entire trip is considered non-commercial, and not commercial. However, if any commercial fishing occurs during or as a result of a vessel-based fishing trip, then the fishing trip is considered commercial, and not non-commercial. Charter boat customers are not subject to the requirements of the section.

665.224 – Permits and Fees

(Add new (3) and change the numbering below to reflect changes)

(3) HI non-commercial. The owner of a vessel that is used for non-commercial, vessel-based fishing, landing, or transshipment of Hawaii coral reef CHCRT MUS in the EEZ around the Hawaiian Archipelago is required to obtain a HI non-commercial permit or a State of Hawaii Commercial Marine License. If one or more persons on a vessel-based fishing trip holds an HI non-commercial permit, then the entire trip is considered non-commercial, and not commercial. However, if any commercial fishing occurs during or as a result of a vessel-based fishing trip, then the fishing trip is considered commercial, and not non-commercial. Charter boat customers are not subject to the requirements of the section.

665.801 – Permits

(Add new (h) and change the numbering below to reflect changes)

(h) HI non-commercial. The owner of a vessel that is used for non-commercial, vessel-based fishing, landing, or transshipment of pelagic MUS in the EEZ around the Hawaiian Archipelago is required to obtain a HI non-commercial permit or a State of Hawaii Commercial Marine License. If one or more persons on a vessel-based fishing trip holds an HI non-commercial permit, then the entire trip is considered non-commercial, and not commercial. However, if any commercial fishing occurs during or as a result of a vessel-based fishing trip, then the fishing trip is considered commercial, and not non-commercial. Charter boat customers are not subject to the requirements of the section.

10.0 References

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Appendix A: Marine Recreational Fisheries of the Western Pacific Region

(From 2009 Pelagics Annual Report)

Introduction

Fishing, either for subsistence or recreation continues to be an extremely important activity throughout the Western Pacific Region in the four major populated island areas of the Western Pacific Region, Hawaii, American Samoa, Guam and the Commonwealth of the Northern Mariana Islands (CNMI). Fish consumption in Micronesia and Polynesia typically averages about 130 lb/per capita/yr (Dalzell et al 1996) and even in more culturally diverse Hawaii, fish consumption is almost three times the US national average at about 42 lb/person/yr (Dalzell & Paty 1996).

Recreational fisheries in the Western Pacific Region

In Hawaii, recreational shoreline fishing was more popular than boat fishing up to and after WW II. Boat fishing during this period referred primarily to fishing from traditional canoes (Glazier 1999). All fishing was greatly constrained during WW II through time and area restrictions, which effectively stopped commercial fishing and confined recreational fishing to inshore areas (Brock 1947). Following WWII, the advent of better fishing equipment and new small boat hulls and marine inboard and outboard engines led to a growth in small vessel-based recreational fishing.

A major period of expansion of small vessel recreational fishing occurred between the late 1950s and early 1970s, through the introduction of fiberglass technology to Hawaii and the further refinement of marine inboard and outboard engines (Figure 1). By the early 1960s there were an estimated 5,300 small boats in the territory being used for recreational fishing. By the 1980s the number of recreational or pleasure craft had risen to almost 13,000 vessels and to about 15,000 vessels in the 1990s. There are presently some 26 fishing clubs in Hawaii, and a variety of different recreational fishing tournaments organized both by clubs and independent tournament organizers. Hawaii also hosts between 150 to 200 boat based fishing tournaments, about 30 of which are considered major competitions, with over 20 boats and entry fees of \$100. This level of interest in recreational fishing is sufficient to support a local fishing magazine, Hawaii Fishing News, which besides articles of interest to recreational fishermen, includes a monthly roundup of the fishing activity and conditions at the major small boat harbors in the State. Further, a directory of the State's small boat harbors and launching ramps is published annually by Hawaii Ocean Industry and Shipping news (see December 2002/January 2003 issue).

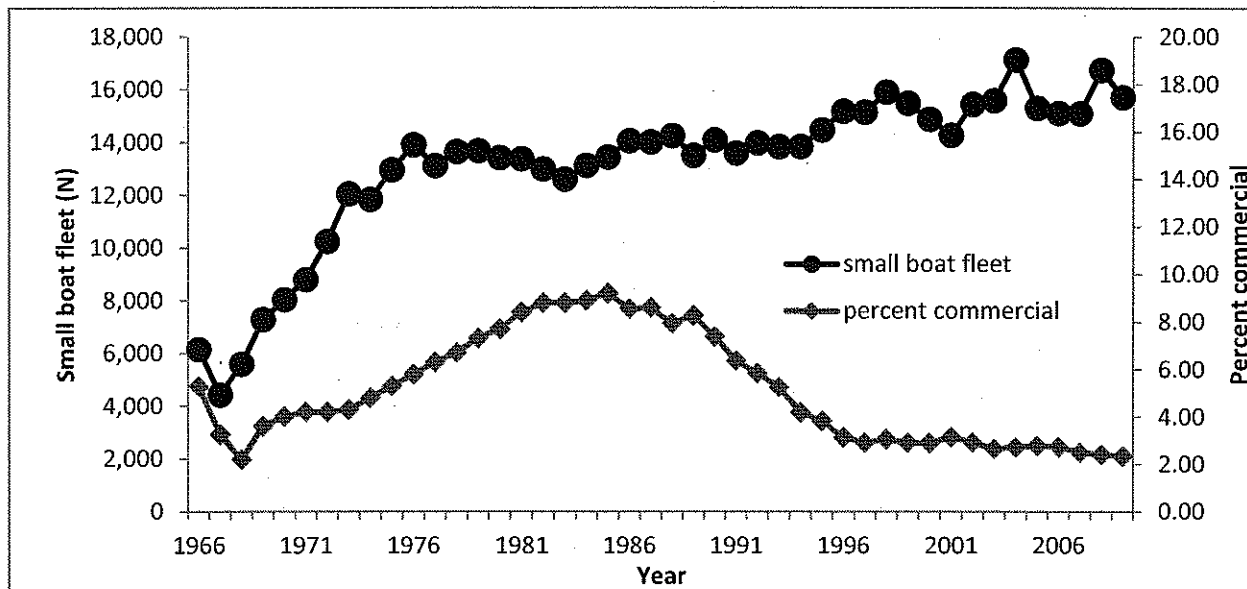


Figure 1 Annual number of small vessel fleet registrations in Hawaii, 1966-2009. Figure shows total fleet size, and percentage of vessels being registered for commercial fishing (Source: Hawaii Division of Boating and Ocean Resources)

Elsewhere in the region, recreational fishing is less structured. In Guam fishing clubs have been founded along ethnic lines by Japanese and Korean residents. These clubs had memberships of 10-15 people, along with their families. Four such clubs were founded in Guam during the past 20 years, but none lasted for more than a 2-3 years (Gerry Davis, Guam DAWR pers. comm.). There was also a Guam Boating Association comprising mostly fishermen, with several hundred members. This organization functioned as a fishing club for about 10 years and then disbanded. Some school groups and the boy scouts have formed fishing clubs focused on rod and reel fishing, and there is still one spear-fishing club that has only a handful of members, but appears to be still be active. There are also some limited fishing tournaments on Guam, including a fishing derby for children organized by the local Aquatic and Wildlife Resources Division. There are few fishing clubs in the in the Northern Mariana Islands. The Saipan Sportfishing Association (SSA) has been in existence for at least 16 years, and is the sponsor of the annual Saipan International Fishing Tournament, which is usually held in August or September. In 1997, the SSA listed approximately 40 members. There is also a Tinian Sportfishing Association, but the status of this club is unknown at this time.

A recent innovation in the Mariana Island is the publication of a free quarterly magazine, Mariana Fishing Magazine, which covers recreational fishing in both Guam and the CNMI.

The founding of the American Samoa Game Fishing Association in 1974 in Pago Pago led to fishing tournaments being held on a regular basis in the territory (Tulafono 2001). A total of 64 tournaments, averaging two to three tournaments per year and 10 to 20 vessels in each competition, were conducted in Pago Pago between 1974 and 1998. However interest in fishing tournaments waned during the late 1990s, with only three vessels participating in the last

tournament held in 1998. The reason for this decline was not entirely clear, but may be related to the expansion of the longline fishery in American Samoa and the shift from commercial trolling to longlining. According to Tulafono, fishermen were more interested in earning income and it was time consuming to switch from longline to troll gear for a weekend of tournament fishing. Tulafono (2001) noted that tag and release programs, which are gaining popularity with recreational and charter-vessel fishermen elsewhere in the U.S., would not be popular in American Samoa. In common with many Pacific islands, fish were caught to keep for food in American Samoa, and fish landings and their distribution through the community were important in order to meet social obligations. Releasing fish would be considered a failure to meet these obligations (Tulafono 2001). More recently, however, fishing tournaments

There is also some recreational fishing activity at some of the Pacific Remote Island Areas (PRIAs), namely at Midway, Wake, Johnston and Palmyra Islands. There are no resident populations at Howland & Baker and Jarvis Islands and fishing activity at these locations is likely minimal. There was a tourist facility at Midway until 2002, which operated a charter boat fishery targeting primarily pelagic fish at Midway Atoll. The company operated five vessels using for charter fishing at Midway: three 22-26 ft catamarans for lagoon and nearshore fishing operations and two 38 ft sportfishing vessels used for blue water trolling. In addition there were approximately seven small vessels maintained and used by Midway residents for recreational fishing. Of this total, three vessels engaged primarily in offshore trolling for PMUS including yellowfin tuna, whao and marlin. All vessels fishing at Midway were required to file a float plan prior to a fishing trip and complete the "Midway Sports Fishing Boat Trip Log" upon completion of each trip. The US Fish and Wildlife Service was responsible for compiling these catch data.

At Palmyra Atoll, an island privately owned by The Nature Conservancy, a 22 ft catamaran is used for offshore trolling and four small boats operated within the lagoon used for bonefish angling. There are several craft used for recreational fishing at the two military bases on Johnson and Wake Islands. These include eight Boston whalers, two cabin cruisers and a landing craft at Johnson, and two landing craft and two small vessels at Wake.

Recreational fisheries in the Western Pacific Region

Estimates of recreational catch for the Western Pacific are given in Table 1. The data for Guam, Northern Mariana Islands and American Samoa are based on the proportion of catches landed for sale and catches retained and not sold, in all landings sampled by creel surveys in each area. The ratio of unsold to sold catch in the samples was used in conjunction with the total catch estimate expanded from the creel survey data. This was adjusted downwards based on the creel surveys by the ratio of landings by vessels retaining 100 % of their catch to the total unsold catch. This accounts for that fraction of the catch not sold by commercial fishing vessels. The volume of fish landed by vessels retaining all their catch was labeled the nominal recreational catch.

The recreational catch for Hawaii is generated from the Hawaii Marine Recreational Fisheries Statistical Survey, which is a collaborative effort between the State of Hawaii's Division of Aquatic Resources and the National Marine Fisheries Service (NMFS) Office of Science and

Technology. This survey is part of the NMFS Marine Fisheries Recreational Statistical Survey (MRFSS) which is being modified following a review by the National Academy of Science in 2006, under the auspices of the Marine Recreational Improvement Program (MRIP).

Table 1. Estimated recreational fish catches in the four principal island groups of the Western Pacific Region in 2009

Location	Year	Total catch (lbs)	Unsold catch (lb)	Nominal recreational catch (lb)	Recr. catch as % of total catch	Recr. fishing trips
American Samoa	2009	10,640,460	2,827	2,732	0.03	44
Guam	2009	622,840	329,340	303,391	48.70	3,764
Hawaii	2009	51,178,951	NA	21,692,676	42.38	361,563
NMI	2009	404,633	91,082	85,423	21.11	4,212

Charter vessel sportsfishing

Tables 2-6 present summaries of the charter vessel sportsfishing in the Western Pacific. Charter fishing in Hawaii is more focused on catching blue marlin, which in 2004 formed about 50 % of the total annual charter vessel catch by weight, but in 2008 only formed about a quarter of the charter vessel catch and was superseded by yellowfin. Although commercial troll vessels also take blue marlin, these only form about a ten percent of their catch, with the majority of the target species being yellowfin, mahimahi, and wahoo (Table 3). Unlike other parts of the US, there is little recreational fishery interest in catching sharks in Hawaii.

Guam has a charter fishing sector, which unlike Hawaii caters for both pelagic and bottomfish fishing. Until recently the troll charter fishery was expanding, but, over the past three years the number of vessels involved, and level of fishing, has decreased in response to lower tourist volume from Japan due to the Asian economic recession in the late 1990s. Nonetheless, although comprising only 5 % of Guam's commercial troll fleet, the Guam troll charter industry accounts for 9.3 % of the troll catch and 30% and 20% of the Guam blue marlin and wahoo catch respectively. (See Guam module in this volume).

Charter fishing in NMI is limited, with about ten boats operating on Saipan, and a few vessels on Tinian conducting occasional fishing charters. Tourism is not a significant component of the American Samoa economy, and hence there is little charter fishing activity. There are few vessels suitable for charter-type operations and the American Samoa government does not actively promote tourism and sportsfishing as the local infrastructure for this is limited (Tulafono 2001).

Table 2. Estimated catches by pelagic charter fishing vessels in Guam, Hawaii and Northern Mariana Islands in 2009

Location	Catch (lb)	Effort (trips)	Principal species
Guam	50,945	1,891	Wahoo, Skipjack, Mahimahi, Blue marlin

Hawaii	515,894	8,640	Yellowfin, Blue marlin, Mahimahi, Wahoo
Northern Mariana Islands	4,691	94	Wahoo, Skipjack, Mahimahi, Blue marlin

Charter vessel fishing in the Western Pacific Region has elements of both recreational and commercial fishing. The primary motivation for charter patrons is recreational fishing, with the possibility of catching large game fish such as blue marlin. The charter vessel skipper and crew receive compensation in the form of the patron's fee, but are also able to dispose of fish on local markets, as is the case in Hawaii. The catch composition of charter vessel catch versus conventional commercial trolling in Hawaii reflects the different targeting in the two fisheries. Blue marlins are the dominant feature of charter vessels in Hawaii, while in Guam (Tables 3 & 4), composition of the charter catch is being broadly similar to the mix of species in the commercial troll catches

Table 3. Comparison of species composition of landings made by Hawaii pelagic charter vessels versus commercial troll vessels, 2009

Species	Charter vessels		Commercial vessels	
	Landings (lb)	Percent	Landings (lb)	Percent
Yellowfin tuna	770,737	33.40%	155,793	30.20%
Mahimahi	506,319	21.94%	123,496	23.94%
Wahoo	384,724	16.67%	43,584	8.45%
Skipjack	253,945	11.01%	33,458	6.49%
Blue marlin	222,276	9.63%	131,515	25.49%
Bigeye tuna	103,736	4.50%	6,851	1.33%
Striped marlin	13,554	0.59%	7,294	1.41%
S.N. spearfish	5,565	0.24%	5,679	1.10%
Other	46,458	2.01%	8,224	1.59%
Total	2,307,314	100.00%	515,894	100.00%

Table 4. Comparison of species composition of landings made by Guam pelagic charter vessels versus commercial troll vessels, 2009

Species	Charter		Commercial	
	Landings (lb)	Percent	Landings (lb)	Percent
Mahimahi	22,588	41.79%	124,061	18.63%
Blue Marlin	12,194	22.56%	20,411	3.07%
Wahoo	9,035	16.72%	121,698	18.28%
Skipjack Tuna	8,381	15.51%	322,682	48.46%

Yellowfin Tuna	1,214	2.25%	49,065	7.37%
Others	637	1.18%	27,925	4.19%
Total	54,049	100.00%	665,842	100.00%

In Hawaii there is considerable variation in charter vessel catches between the various islands (Table 5), with the largest charter vessel fishery based on the island of Hawaii. In 2008, charter vessel catches on the island of Hawaii accounted for nearly 40% of the total charter vessel landings within the state, with Oahu, Kauai, and Maui County charter vessels forming the remaining charter vessel catch.

Table 5. Charter vessel catches in Hawaii by island, 2009

Island	Catch	Percent	Trips	Percent	CPUE (lb/trip)
Hawaii	169,151	32.79%	4,052	46.90%	41.75
Kauai	75,520	14.64%	1,284	14.86%	58.82
Maui County*	48,617	9.42%	1,230	14.24%	39.53
Oahu	222,605	43.15%	2,074	24.00%	107.33
Total	515,894	100.00%	8,640	100.00%	59.71

* DAR confidentiality protocols prevent reporting 2007 charter vessel activity for Molokai and Lanai separately, and these are aggregated with data for Maui, reported collectively as Maui County

Most charter vessel fishing on the island of Hawaii is conducted from Kona's small boat harbor at Honokohau, and about one thirds of the charter vessel catch comprises blue marlin (Table 6). Blue marlin used to amount to about two-thirds of the catch, but this number has fallen considerably with the spread of a stronger catch and release ethic for billfish by charter vessel operators at Honokohau. Elsewhere, yellowfin and mahimahi dominate charter vessel landings, with blue marlin comprising between 12% and 24% of catches. Other important species in the charter vessel catches, depending on location, comprise , wahoo, spearfish and skipjack.

Table 6. Composition of charter vessel catches in the Main Hawaiian Islands, 2009

Hawaii	Landings (lb)	Percent	Kauai	Landings (lb)	Percent
Blue marlin	61,829	36.55%	Yellowfin tuna	27,534	36.46%
Yellowfin tuna	45,937	27.16%	Skipjack	17,061	22.59%
Mahimahi	26,036	15.39%	Mahimahi	12,459	16.50%
Wahoo	17,196	10.17%	Blue marlin	9,384	12.43%
Bigeye tuna	4,930	2.91%	Wahoo	6,788	8.99%
Spearfish	4,216	2.49%	Striped marlin	713	0.94%
Skipjack	4,064	2.40%	Kahala	490	0.65%
Striped marlin	2,874	1.70%	Kawakawa	379	0.50%
Other	2,070	1.22%	Other	713	0.94%

Total	169,151	100.00%		75,520	100.00%
Maui	Landings	Percent	Oahu	Landings	Percent
	(lb)			(lb)	
Mahimahi	19,983	8.98%	Yellowfin tuna	77,473	34.80%
Blue marlin	10,084	4.53%	Mahimahi	65,017	29.21%
Wahoo	9,320	4.19%	Blue marlin	50,218	22.56%
Yellowfin tuna	4,850	2.18%	Skipjack	12,168	5.47%
Bigeye tuna	1,147	0.52%	Wahoo	10,280	4.62%
Striped marlin	847	0.38%	Striped marlin	2,860	1.28%
Kawakawa	211	0.09%	Spearfish	1,253	0.56%
Spearfish	210	0.09%	Kawakawa	1,133	0.51%
Skipjack	166	0.07%	Bigeye tuna	774	0.35%
Other	1,799	0.81%	Other	1,429	0.64%
Total	48,617	100.00%	Total	222,605	100.00%

Recreational Fishing Data Collection in Hawaii

Recreational fish catches in Hawaii are monitored through the Hawaii Marine Recreational Fishing Survey (HMRFS), a collaborative project of the NMFS Office of Science and Technology and the Hawaii Division of Aquatic Resources. This project is a segment of the nationwide Marine Recreational Fisheries Statistical Survey (MRFSS), which has been used by NMFS to estimate recreational catches in most of the coastal states of the US.

The MRFSS program uses a triple survey approach that has been developed over the 20+ years of its history. For each two-month survey period (wave) a random sample of households is called by telephone to determine how many have done any fishing in the ocean, their mode of fishing (private boat, rental boat, charter boat, or shoreline), what methods were used, and how much effort (number of trips and hours) was expended. Concurrently, surveyors are sent out to boat launch ramps, small boat harbors, and shoreline fishing sites to interview fishermen to fill out intercept survey forms. The intercept survey collects data on fishing area, fishing methods, trip/effort, species caught, and lengths and weights of fish. The sites are randomly selected, but stratified by fishing pressure so that the sites with the highest pressures are likely to be surveyed more often. In addition the charter boat operators are surveyed by a separate survey. This additional survey of the charter fleet serves the same function as the random digit dialing household survey and is necessary because out of town fishers that charter vessels wouldn't be covered by randomly calling the Hawaiian populace. The telephone and charter survey data are used to estimate total statewide fishing effort and the intercept surveys provide detailed catch and trip information. Data from the three surveys are combined and expanded by computer to yield statewide estimates of total effort and catch by species, mode, and county.

NMFS and HDAR contributed joint funding for intercept surveys and charter boat surveys on the islands of Oahu, Hawaii, and Maui. NMFS also funded the Random Digit Dialing household telephone survey via a national contractor beginning in January 2001. The HMRFS project commenced in July 2001 but took until 2003 until annual results were first reported from this initiative.

In 2006, the MRFSS survey was reviewed by the National Research Council of the National Academy of Sciences (NRC 2006). The reviewers were critical of the statistical methods employed to generate expansions of the survey data to annual recreational catch estimates for each state. Consequently, NMFS is conducting an overhaul of the MRFSS survey to respond to the NRC criticisms. As such, readers of this report should understand that there is uncertainty surrounding the various expansions from the HMFRS survey and figures reported here may change as new methods are developed to conduct the expansions from survey data. However, Table 7 provides summaries of the recreational boat and shoreline fish catch between 2003 and 2008 for pelagic and other species of fish.

Table 7. Recreational fish catches in Hawaii between 2003 and 2008. Source: HMFRS

Year	(Fish type)	Boat –based (lbs)	Shore-based (lbs)	Total
2003	Pelagic	14,905,992	422,434	15,328,426
	Others	517,119	1,429,637	1,946,756
	Total	15,423,111	1,852,071	17,275,182
2004	Pelagic	12,210,684	120,780	12,331,464
	Others	1,193,998	1,148,203	2,342,202
	Total	13,404,683	1,268,983	14,673,666
2005	Pelagic	12,804,980	229,060	13,034,040
	Others	795,859	1,015,650	1,811,509
	Total	13,600,839	1,244,710	14,845,549
2006	Pelagic	11,830,852	258,802	12,089,653
	Others	856,243	1,519,289	2,375,533
	Total	12,687,095	1,778,091	14,465,186
2007	Pelagic	13,956,647	114,831	14,071,478
	Others	404,284	346,457	750,741
	Total	14,360,931	461,288	14,822,219
2008	Pelagic	21,802,390	56,937	21,859,327
	Others	231,584	773,611	1,005,195
	Total	22,033,974	830,548	22,864,522
2009	Pelagic	17,071,412	66,635	17,138,048
	Others	272,841	369,993	642,834
	Total	17,344,253	436,629	17,780,882

Figures 2-5 summarize aspects of the boat-based recreational fishery landings for six major pelagic fish species in Hawaii (blue marlin, striped marlin, mahimahi, skipjack, yellowfin and wahoo) between 2003 and 2009, while Figure 6 shows the bimonthly distribution of boat-based fishing effort over the same time period. Skipjack tuna are the most commonly recreationally caught pelagic fish (Figure 2) followed by yellowfin tuna, mahimahi and wahoo. In terms of weight, however, yellowfin tuna dominates recreational pelagic fish catches (Figure 3).

Although blue marlin numbers in the catch are small compared to other species, the much greater average weight (Figure 3) means that it can comprise a significant fraction of the recreational catch by weight. Average weights for most species tended to be relatively similar between years for mahimahi, skipjack and wahoo, but may vary considerable between years for blue marlin, striped marlin and yellowfin tuna. This is also reflected in the nominal catch rate (lbs/trip) in Figure 4, where yellowfin catch rate was much higher in 2003 than in 2004 and 2005, and increased to a new maximum in 2008. The distribution of fishing recreational fishing effort shows that boat based activity is highest in the summer and fall when the weather is at its most clement in Hawaii.

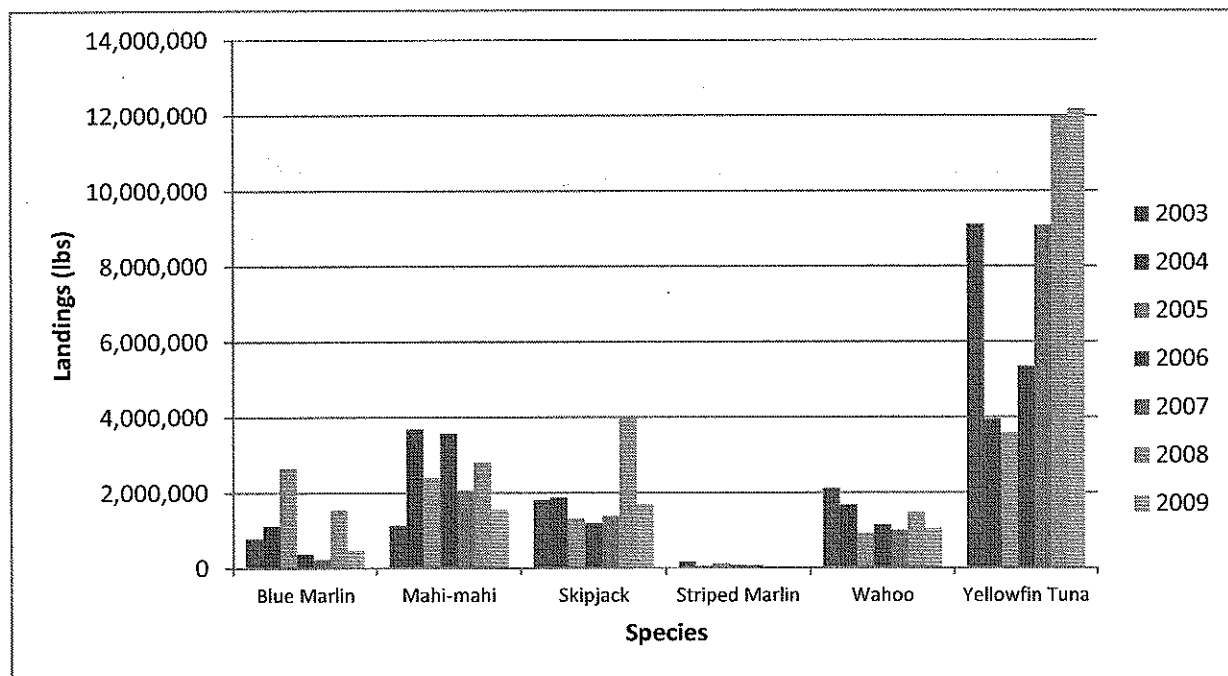


Figure 2. Annual recreational fishery landings by weight of six major pelagic fish species in Hawaii between 2003 and 2008

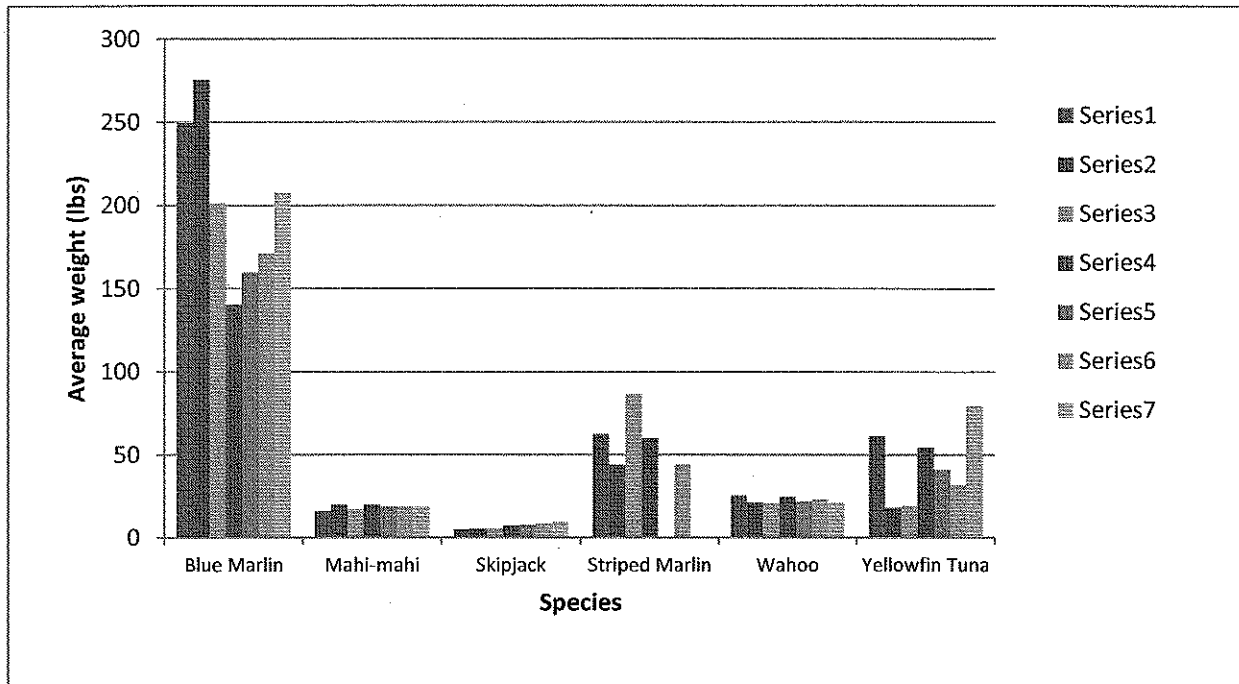


Figure 3. Average weight of six major pelagic fish species caught by recreational fishing in Hawaii between 2003 and 2008

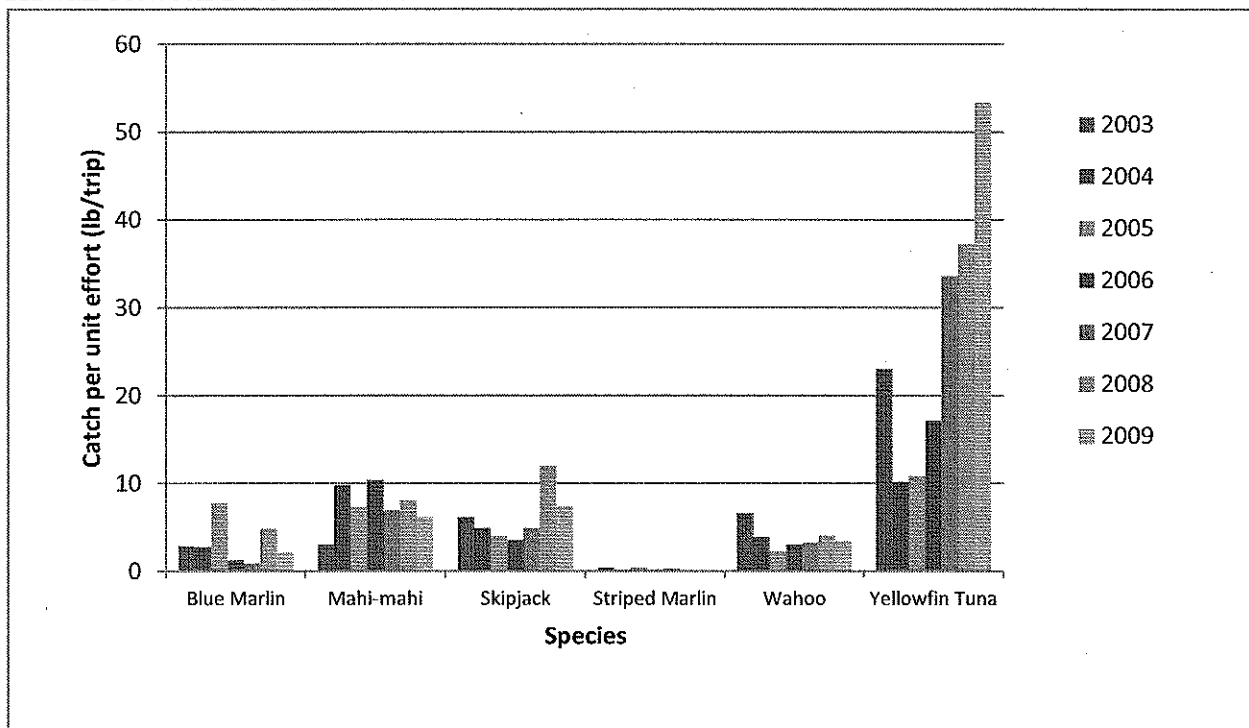


Figure 4. Annual recreational catch per unit effort (lbs per trip) for six major pelagic species in Hawaii between 2003 and 2008

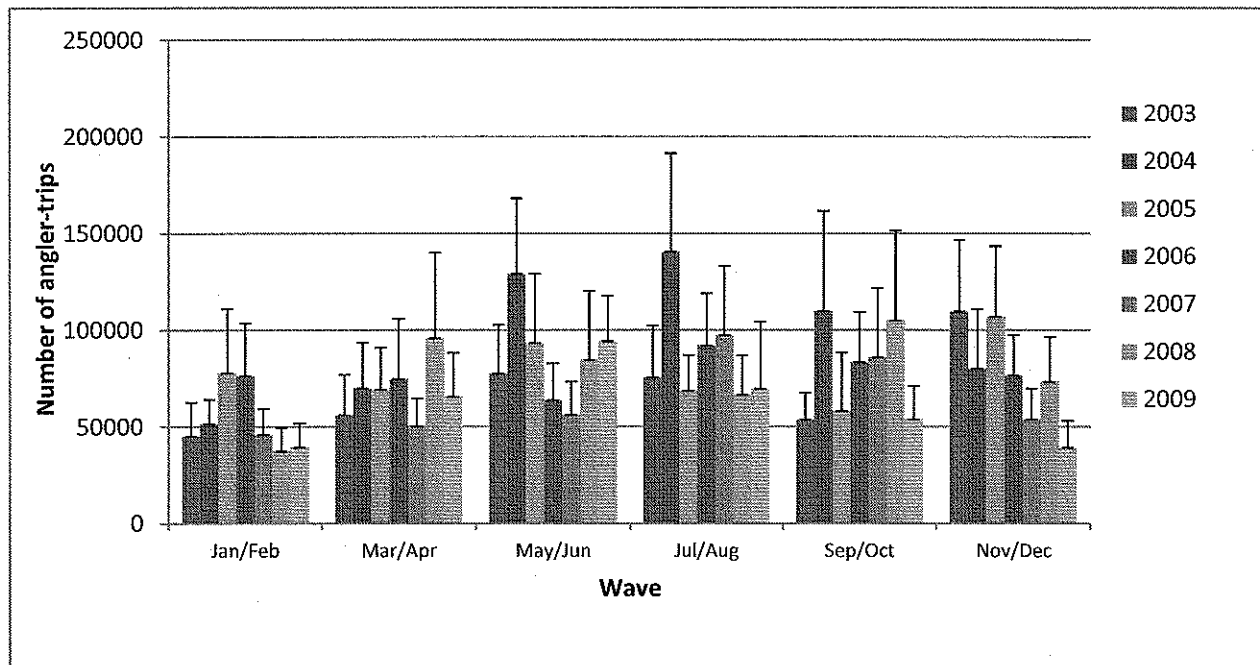


Figure 5. Annual private vessel recreational fishing effort in Hawaii between 2003 and 2008

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