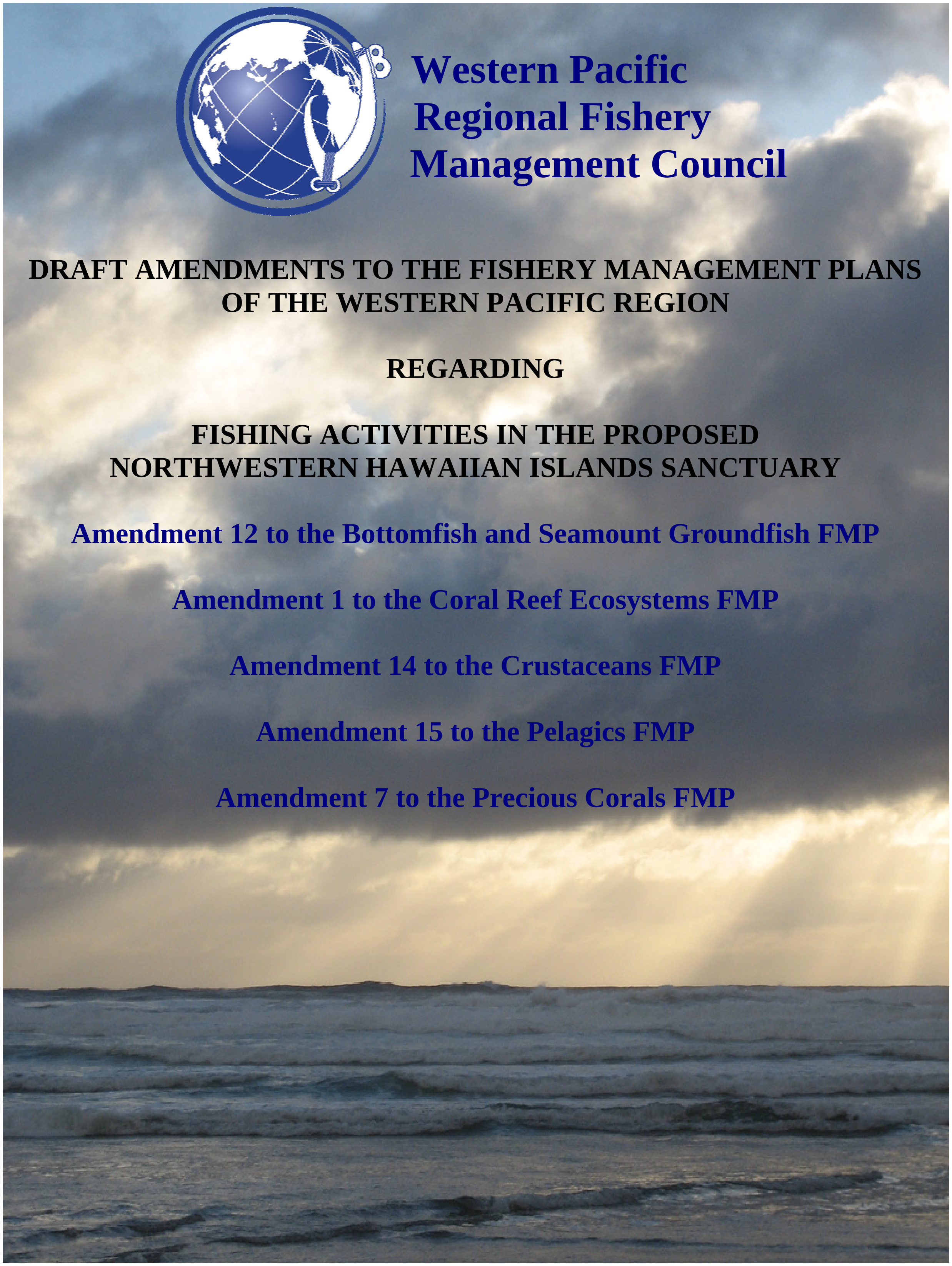

Western Pacific
Regional Fishery
Management Council

DRAFT AMENDMENTS TO THE FISHERY MANAGEMENT PLANS OF THE WESTERN PACIFIC REGION

REGARDING

FISHING ACTIVITIES IN THE PROPOSED NORTHWESTERN HAWAIIAN ISLANDS SANCTUARY

Amendment 12 to the Bottomfish and Seamount Groundfish FMP

Amendment 1 to the Coral Reef Ecosystems FMP

Amendment 14 to the Crustaceans FMP

Amendment 15 to the Pelagics FMP

Amendment 7 to the Precious Corals FMP

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April 3, 2006

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EXECUTIVE SUMMARY

On January 18, 2006 the Western Pacific Regional Fishery Management Council (also known as the Western Pacific Fishery Management Council, or Council) received a letter from the Under Secretary of Commerce for Oceans and Atmosphere stating that the National Oceanic and Atmospheric Administration (NOAA) plans to publish a Draft Environmental Impact Statement (DEIS) and draft fishing regulations for the proposed Northwestern Hawaiian Islands (NWHI) sanctuary in June 2006. The Under Secretary informed the Council that NOAA is considering three alternatives in its DEIS. The first would allow limited fishing activities within the proposed sanctuary to continue indefinitely, the second would end such fishing by 2025, and the third would end it after five years following sanctuary designation. The first two alternatives include catch levels and permit limits for the proposed sanctuary. For the five year alternative, the number of permits would be limited to those permits active at the (yet to be determined) time of designation. The Under Secretary went on to say that while a factual basis supporting the legality of establishing catch and permit limits has not been fully developed, NOAA believes that there is a credible basis for moving forward with proposing such limits through amendments to the Council's existing Fishery Management Plans (rather than as regulations under the National Marine Sanctuaries Act). However to meet NOAA's DEIS timeline, the Council was informed that it would have transmit its amendment package(s) to NOAA no later than May 1, 2006. If one of the alternatives described above is selected by NOAA as a preferred alternative, the agency would review the Council's proposed MSA regulations as a potential implementation mechanism.

In response to the above proposal, this document presents a range of alternatives considered by the Council regarding fishing regulations within the proposed NWHI sanctuary. In brief, these are two versions of the "no action" alternative, an alternative that includes measures for each of the three alternate timeframes under consideration by NOAA, and a preliminarily preferred alternative developed and recommended by the Council at their 131st meeting held March 13-16 in Honolulu, Hawaii.

Also described are the NWHI environment and a summary of the anticipated impacts of the alternatives on the environment including fishery participants and support industries, Hawaii's broader communities, and the nation as a whole.

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1.0 CHAPTER ONE: INTRODUCTION

1.1 Purpose and Need

On December 4, 2000, President Clinton issued Executive Order (EO) 13178 establishing the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve (Reserve). President Clinton subsequently revised portions of EO 13178 and completed establishment of the Reserve in EO 13196. The Reserve is managed by the National Marine Sanctuary Program which is within the National Oceanic and Atmospheric Administration (NOAA). Pursuant to the EOs and the National Marine Sanctuaries Act (16 U.S.C. 1433, 1434), NOAA is initiating the process to designate the Reserve as a National Marine Sanctuary. Section 304(a) (5) of the National Marine Sanctuaries Act (NMSA) provides an opportunity for Regional Fishery Management Councils to develop and recommend fishing regulations for proposed sanctuaries.

Consistent with the Section 304(a)(5) process, at its 126th meeting (March 14-17, 2005 in Honolulu, Hawaii) the Western Pacific Regional Fishery Management Council (Council) took final action to recommend specific regulations regarding fishing in the proposed Northwestern Hawaiian Islands (NWHI) sanctuary. On April 14, 2005, the Council transmitted these draft regulations to NOAA for their review and consideration as to whether they were consistent with the purposes and polices of the NMSA as well as the goals and objectives of the proposed sanctuary. On October 24, 2005, NOAA advised the Council that its proposed fishing regulations "do not fulfill the purposes and polices of the NMSA and the goals and objectives of the proposed NWHI sanctuary". NOAA's response went on to say that the agency hoped that the Council would participate in the regulation of NWHI fishing through amendments to its existing or new fishery management plans.

More recently, NOAA has proposed that if the Council were to amend its fishery management plans to accord with NOAA's "sideboards" regarding NWHI fishing; there would be a high likelihood that these amended plans would be accepted for the proposed NWHI sanctuary, with associated fishing regulations promulgated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). These "sideboards" include moratoriums on the harvest of crustaceans, precious corals and coral reef ecosystem associated species, area closures, and caps on the number of participants and total harvests in the bottomfish and pelagic fisheries.

On January 18, 2006, the Council received a letter from the Under Secretary of Commerce for Oceans and Atmosphere stating that NOAA plans to publish a Draft Environmental Impact Statement (DEIS) and draft fishing regulations for the proposed NWHI sanctuary in June 2006. The Under Secretary informed the Council that NOAA is considering three alternatives in its DEIS. The first would allow limited fishing activities within the proposed sanctuary to continue indefinitely, the second would end such fishing by 2025, and the third would end it after five years following sanctuary designation. The first two alternatives include catch levels and permit limits for the proposed sanctuary. For the five-year alternative, the number of permits would be limited to those permits active at the (yet to be determined) time of designation. The Under Secretary went on to say that while a factual basis supporting the legality of establishing catch and permit limits has not been fully developed, NOAA believes that there is a credible basis for moving forward with proposing such limits through amendments to the Council's existing Fishery Management Plans (rather than as regulations under the NMSA). However to meet NOAA's DEIS timeline, the Council was informed that it would have to transmit the amendment package(s) to NOAA no later than May 1, 2006. If one of the alternatives described above is selected by NOAA as a preferred alternative, the agency would review the Council's proposed MSA regulations as a potential implementation mechanism. Please see Appendix C to review this correspondence.

In response to the above proposal, this document presents and analyzes a range of alternatives considered by the Council regarding fishing regulations within the proposed NWHI sanctuary. A summary document regarding this issue was mailed to over 3,000 Hawaii-based commercial fishermen and other interested parties in February, 2006. Recipients were also informed of an upcoming series of public hearings on this issue to be held by the Council and NMFS around the State of Hawaii. Hearings were from 6:00-9:00 p.m. held on the following dates and locations:

March 2, 2006	Maui Beach Hotel, Kahului, Maui
March 3, 2006	Helene Social Hall, Hana, Maui
March 6, 2006	University of Hawaii, Hilo, Hawaii
March 7, 2006	Naalehu Elementary School, Naalehu, Hawaii
March 8, 2006	Kohala Elementary School, Kapaau, Hawaii
March 9, 2006	Mitchell Pauole Center, Kaunakakai, Molokai
March 10, 2006	Kapaa High School, Kapaa, Kauai
March 14, 2006	Ala Moana Hotel, Honolulu, Oahu

The alternatives and analyses contained in this document were subsequently considered by the Council at their 131st meeting, held March 13-16, 2006 in Honolulu Hawaii (FR 71, 9522 February 24, 2006). The Council also heard several presentations by NMFS and other scientists regarding the status of Hawaii's bottomfish stocks and marine ecosystem, and took comments from the public. The Council concluded by taking initial action regarding the management of fisheries in the proposed NWHI sanctuary as follows:

1. Recommends that limited fishing be allowed in federal waters of the proposed NWHI National Marine Sanctuary and managed under the Magnuson-Stevens Act (except for recreational fishing at Midway Atoll), consistent with codified federal regulations and subject to the following restrictions:

    a. A closure be established indefinitely for all harvests of crustacean, precious coral and coral reef ecosystem species;
    b. All commercial and recreational fishing be subject to Magnuson-Stevens Act permit and logbook reporting requirements;
    c. Recreational fishing permits be issued on a case-by case basis, and that the Council will evaluate the need for further management.
    d. Limited-entry NWHI bottomfish permits be capped at 14, with 7 permits for the Ho'omalu Zone and 7 permits for the Mau Zone (the two Community Development

Program permits for indigenous use to be included in the latter and issued as previously recommended by the Council);

e. The annual bottomfish catch be limited to 381,500 lbs (85 percent of MSY);
f. Non-longline commercial pelagic fishing permits be capped at three (3);
g. The annual commercial pelagic catch by the non-longline pelagic fishery and the limited-entry bottomfish fishery be limited to 180,000 lbs.;
h. No-take MPAs be established around French Frigate Shoals and West of 174° W longitude;
i. The use-or-lose requirements for renewal of commercial bottomfish permits be removed;
j. Relinquished or revoked commercial bottomfish permits be reissued by NMFS in accordance with the existing procedures for Ho'omalu Zone permits and as described in the Council's previous recommendation for Mau Zone permits.
k. Federally permitted research regarding fishery and ecosystem conservation and management would be allowed in Federal waters .

2. Recommends NMFS work with the USFWS and request the USFWS to:

   a. Apply the same data reporting protocols that NMFS uses in collecting fishery dependent data;
   b. Accurately collect and maintain all non-commercial fishing data collected on Midway Atoll

3. Recommends that Native Hawaiian subsistence and sustenance use of NWHI fishery resources be allowed and managed in federal waters of the proposed NWHI National Marine Sanctuary under the National Marine Sanctuaries Act. However, the Council requests that NMFS work with the NMSP to ensure that all catch data is collected so it can be incorporated into NMFS' ecosystem assessments and monitoring of stock sustainability.

4. Recommends that harvests of NWHI fishery resources by permitted research, enforcement and management (e.g. marine debris clean up vessels and sanctuary "management vessels") vessels for on-board consumption (i.e. sustenance) be allowed and managed in federal waters of the proposed NWHI National Marine Sanctuary under the National Marine Sanctuaries Act. However, the Council requests that NMFS work with the NMSP to ensure that all catch data is collected so it can be incorporated into NMFS' ecosystem assessments and monitoring of stock sustainability.

This recommendation is included in this document as Alternative 3, the preliminarily preferred alternative.

1.2 Responsible Agencies

The Council was established by the Magnuson-Stevens Fishery and Conservation Management Act to develop Fishery Management Plans (FMPs) for fisheries in offshore waters around around American Samoa, Guam, Hawaii and Commonwealth of the Northern Mariana Islands and the

U.S. possessions in the Pacific.[1] Once an FMP is approved by the Secretary of Commerce, it is implemented by federal regulations which are enforced by the National Marine Fisheries Service and the U.S. Coast Guard, in cooperation with state, territorial and commonwealth agencies. For further information contact:

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1.3 Management Objectives for the Proposed NWHI National Marine Sanctuary

The general objective of the Council is to develop appropriate fishery management measures (and associated regulations) for the proposed NWHI National Marine Sanctuary. Under the National Marine Sanctuaries Act, and the Magnuson-Stevens Fishery Conservation and Management Act (MSA), these measures must be consistent with the 1) the purposes and policies of the National Marine Sanctuaries Act, 2) the National Marine Sanctuary Program's Goals and Objectives for the proposed Northwestern Hawaiian Islands National Marine Sanctuary, 3) the Council's Goal and Objectives for fisheries in the proposed Northwestern Hawaiian Islands National Marine Sanctuary, 4) the MSA's National Standards, 5) and the specific objectives of each Fishery Management Plan (FMP).

1.4 National Marine Sanctuary Act Purposes and Policies

The NMSA details the following overall purposes and policies for the establishment of the National Marine Sanctuary System as:

(1) to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;

(2) to provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;

(3) to maintain the natural biological communities in the national marine sanctuaries, and to protect, and, where appropriate, restore and enhance natural habitats, populations, and ecological processes;

[1] Howland, Baker, Jarvis, Wake and Johnston Islands, Palmyra and Midway Atolls and Kingman Reef.

(4) to enhance public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System;

(5) to support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas;

(6) to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;

(7) to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;

(8) to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques; and

(9) to cooperate with global programs encouraging conservation of marine resources.

1.5 National Marine Sanctuary Program Goals and Objectives

The National Marine Sanctuary Program has adopted the following Goals and Objectives for the proposed NWHI National Marine Sanctuary as described in the September 20, 2004 document "Proposed Northwestern Hawaiian Islands National Marine Sanctuary - Advice and Recommendations on Development of Draft Fishing Regulations Under the National Marine Sanctuaries Act Section 304(a)(5)":

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

Objectives:

1a. Develop and implement a comprehensive management plan that integrates best practices, available science, traditional knowledge, and innovative management techniques, and addresses both short-term and long-term resource protection needs.

1b. When there in uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

1c. Develop and implement the necessary prohibitions, rules, regulations and penalty schedules to achieve the primary purpose of resource protection and address the needs of the Sanctuary.

1d. Develop and implement surveillance and enforcement program needed to ensure compliance with regulations.

1e. Cooperate with regional and global programs encouraging conservation of marine resources.

Goal 2: Provide for comprehensive and coordinated conservation and management that recognizes and complements existing jurisdictional boundaries and management regimes and involves stakeholder communities.
Objectives:

2a. Develop and implement regional and global approaches, interagency agreements, and processes with partners to address key cross-jurisdictional activities such as education research and monitoring, enforcement and surveillance, and access.

2b. Create a permit, notification, and tracking systems for access and use that is compatible and coordinated with partner agencies.

2c. Coordinate all activities to minimize impacts to ecosystems, avoid redundant or duplicative efforts, and to achieve efficient use of agency resources.

2d. Engage representative stakeholder communities and the public in seeking advice for effective management.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives:

3a. Allow access only for activities consistent with long-term ecosystem protection.

3b. The management system shall continue to allow Native Hawaiian cultural, religious, and subsistence uses.

3c. Develop a marine zoning system that prescribes further limits on use to enhance ecosystem protection and ease of management and enforcement.

3d. Develop a permit and tracking system to identify, evaluate, and monitor activities, access, and uses in order to ensure consistency with long-term ecosystem protection.
3e. Develop other measures as may be necessary to ensure long-term ecosystem protection.

3f. Work with the appropriate domestic and international agencies to adopt a notification requirement for transiting non-military vessels and the designation of special maritime zones on nautical charts.

Goal 4: Enhance public awareness, understanding, and appreciation of the marine environment and cultural and maritime heritage resources.

Objectives:

4a. Develop public outreach and education programs with partners to raise public awareness of NWHI marine ecosystems and the need to protect them and to effectively communicate access and use restrictions.

4b. In order to minimize the use of and impact to the region, plan and establish programs that emphasize the concept of bringing the place to the people, rather than the people to the place.

4c. Increase awareness of marine conservation in the NWHI by emphasizing the global nature of threats to the ecosystem and the importance of the region to the state, the nation, and the world.

4d. Enhance the effectiveness of education programs and public outreach by incorporating Native Hawaiian culturally based themes and traditional approaches to learning, multiple perspectives, histories, and stories of the region.

Goal 5: Support Native Hawaiian cultural, religious, and subsistence practices that are consistent with the long-term conservation and protection of the region.

Objectives:

5a. Build capacity within the Sanctuary program to develop a working relationship with Native Hawaiians to facilitate their participation in the management of the Sanctuary.
5b. Develop a plan for Native Hawaiian access and use in the NWHI collaboratively with Native Hawaiians and regional partners.

5c. Increase understanding of Native Hawaiian histories and cultural practices in the NWHI through research and oral traditions.

5d. Integrate Native Hawaiian traditional knowledge, values, and perspectives into management and education programs.

Goal 6: Support, promote, and coordinate research and long-term monitoring that improves management decision-making and is consistent with the conservation and protection of the region.

Objectives:

6a. Identify, assess, prioritize, and authorize ecological, historical, cultural, and socioeconomic research and monitoring necessary for effective management of the region.

6b. Coordinate with regional and national agencies to make vessels and other resources available for conservation and research activities.

6c. Compile existing research and avoid duplication by collaborating and coordinating with jurisdictional partner agencies and universities.

6d. Develop the ability to quickly assess and response to unexpected, rapid ecological changes that have occurred as a result of storm events, dramatic climate and temperature shifts, and other occurrences.

6e. Establish criteria for cultural research activities through consultation with Native Hawaiians.

6f. Work with partners and researchers to make NWHI research available and accessible to the public in a timely manner.

Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas that minimize or prevent interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.
Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7a. Prohibit non-subsistence crustacean fishing.

7b. Prohibit commercial precious coral fishing.

7c. Prohibit harvest of all coral species, live rock, all aquaria species and live fish trade species, and algae, sponges, and other invertebrates.

7d. Allow recreational fishing for pelagic species except within sensitive habitats.

7e. Allow bottomfishing to continue except within sensitive habitats.

7f. Allow commercial pelagic fishing using handline, pole and line and trolling gear except within sensitive habitats.

7g. Prohibit subsistence use within the sanctuary except for Native Hawaiian subsistence use

7h. Allow sustenance fishing for pelagic and bottomfish species using pole and line, trolling and handline methods within the Sanctuary except within sensitive habitats.

7i. Allow spearfishing without the use of SCUBA for pelagic species except within sensitive habitats.

7j. All fishing not specifically allowed shall be prohibited.

7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

1.6 Western Pacific Regional Fishery Management Council Goal and Objectives for Fisheries Within the Proposed NWHI Sanctuary

The Council has adopted the following Goal and Objectives for fisheries in the proposed NWHI National Marine Sanctuary (see Appendix C).

Goal: Maintain ecosystem integrity by applying ecosystem-based management and research principles to fishing activities. Sustain ecosystem protection while minimizing adverse socioeconomic impacts.

Objectives:

7a. Protect ecosystem integrity by applying a precautionary approach and continuing research on crustaceans and precious corals fisheries to determine if, and how, harvests can be allowed without damaging the integrity of the NWHI ecosystem.

7b. Protect the substrate of the NWHI ecosystem through prohibitions on the collection of reef building corals and live rock.

7c. Protect ecologically valuable areas from damage resulting from fishing activities, consistent with available biological and ecological information.

7d. Protect Hawaiian monk seals, sea turtles, seabirds and other protected wildlife by controlling fishing activities in areas where interactions are known to occur.

7e. Maintain ecosystem integrity by controlling the harvests of pelagic, botttomfish, and coral reef associated species consistent with available biological and ecological information.

7f. Maintain ecosystem integrity while minimizing adverse socioeconomic and cultural impacts.

7g. Employ principles of equity and fairness when allocating fishing rights.

7h. Protect Native Hawaiian cultural rights by promoting access for non-commercial fishing uses by Native Hawaiians to the extent possible without damaging the integrity of the NWHI ecosystem.

7i. Promote increased understanding of the NWHI ecosystem through comprehensive and coordinated research.

7j. Apply ecosystem-based principles through coordinated management with NWHI management and research partners.

1.7 Magnuson-Stevens Fishery Conservation and Management Act National Standards

The MSA National Standards are as follows:

National Standard 1 -- 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 -- Conservation and management measures shall be based upon the best scientific information available.

National Standard 3 -- 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 -- 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 -- 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 -- Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources and catches.

National Standard 7 -- Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

National Standard 8 -- 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 -- 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 -- Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

1.8 Bottomfish and Seamount Groundfish Fishery Management Plan Objectives

The objectives of the Bottomfish and Seamount Groundfish FMP are as follows:

Objective 1. Protect against overfishing and maintain long-term productivity of bottomfish stocks

Objective 2. Improve the database for future decisions through data reporting requirements and cooperative Federal/State/Territory programs.

Objective 3. Provide for consistency in Federal/State/Territory bottomfish management to ensure effective management across the range of fisheries

Objective 4. Protect bottomfish stock and habitat from environmentally destructive fishing activities and enhance habitat if possible.

Objective 5. Maintain existing opportunities for rewarding experiences by small-scale commercial, recreational, and subsistence fishermen, including native Pacific islanders.

Objective 6. Maintain consistent availability of high quality products to consumers.

Objective 7. Maintain a balance between harvest capacity and harvestable fishery stocks to prevent over-capitalization.

Objective 8. Avoid taking protected species and minimize possible adverse modifications to their habitat

Objective 9. Restore depleted groundfish stocks and to provide the opportunity to U.S. fishermen to develop new domestic fisheries for groundfish which will displace foreign fishing.

Objective 10. Monitor stock recovery of depleted stocks in the FCZ [EEZ] so that any international plan action for managing the common resource can be guided by experimental results.

1.9 Crustaceans Fishery Management Plan Objectives

The objectives of the Crustaceans FMP are as follows:

Objective 1. To ensure the long term productivity of the stock and prevent overfishing;

Objective 2. To promote the efficient contribution of the spiny lobster resource to the national economy ;

Objective 3. To collect and analyze biological and economic information about the lobster fishery and improve the basis for conservation and management in the future;

Objective 4. To prevent unfavorable impacts of the fishery on Hawaiian monk seals and other endangered and threatened species.

1.10 Precious Corals Fishery Management Plan Objectives

The objectives of the Precious Corals FMP are as follows:

Objective 1. Allow a fishery for precious coral in the EEZ in the western Pacific but limit the fishery so as to achieve the Optimum Yield on a continuing basis;

Objective 2. Prevent overfishing and wastage of resources;
Objective 3. Encourage the use of selective harvesting methods;

Objective 4. Minimize the harvest of colonies of coral which are immature;

Objective 5. Minimize the harvest of colonies of coral which have not reached their full potential for growth; and

Objective 6. Encourage the acquisition and analysis of new information concerning the distribution, abundance and ecology of precious corals.

1.11 Coral Reef Ecosystems Fishery Management Plan Objectives

The objectives of the Coral Reef Ecosystems FMP are as follows:

Objective 1. To foster sustainable use of multi-species resources in an ecologically and culturally sensitive manner, through the use of the precautionary approach and ecosystem-based resource management.

Objective 2. To provide a flexible and responsive management system for coral reef resources that can rapidly adapt to changes in resource abundance, new scientific information, and changes in fishing patterns among user groups or by area.

Objective 3. To establish integrated resource data collection and permitting systems, establish a research and monitoring program to collect fishery and other ecological information, and to collect scientific data necessary to make informed management decisions about coral reef ecosystems in the EEZ.

Objective 4. To minimize adverse human impacts on coral reef resources by establishing new—and improving existing—marine protected areas, managing fishing pressure, controlling wasteful harvest practices, reducing other anthropogenic stressors directly affecting coral reef resources, and allowing the recovery of naturally-balanced reef systems. This objective includes the conservation and protection of essential fish habitats.

Objective 5. To improve public and government awareness and understanding of coral reef ecosystems and their vulnerability and resource potential in order to reduce adverse human impacts and foster support for management.

Objective 6. To collaborate with other agencies and organizations concerned with the conservation of coral reefs, in order to share in decision-making and to obtain and share data and resources needed to effectively monitor this vast and complex ecosystem.

Objective 7. To encourage and promote improved surveillance and enforcement to support the plan's management measures.

Objective 8. To provide for sustainable participation by fishing communities in coral reef fisheries and, to the extent practicable, minimize the adverse economic impacts on such communities.

1.12 Pelagics Fishery Management Plan Objectives

The objectives of the Pelagics FMP are as follows:

Objective 1. To manage fisheries for management unit species in the Western Pacific Region to achieve optimum yield (OY);

Objective 2. To promote, within the limits of managing at OY, domestic harvest of the management unit species in the Western Pacific EEZ and domestic fishery values associated with these species, for example, by enhancing the opportunities for:

- *a. satisfying recreational fishing experiences,*
- *b. continuation of traditional fishing practices for non-market personal consumption and cultural benefits,*
- *c. domestic commercial fishermen, including charter boat operations, to engage in profitable fishing operations,*

Objective 3. To diminish conflicts in the EEZ, particularly in areas of concentrated domestic fishing, *Objective 4. To improve the statistical base for conducting better stock assessments and fishery evaluations thus supporting fishery management and resource conservation in the EEZ and throughout the range of the management unit species,*

Objective 5. To promote the formation of a regional or international arrangement for assessing and conserving the management unit species and tunas throughout their range,

Objective 6. To preclude waste of management unit species associated with longline, purse seine, pole-and-line or other fishing operations; and

Objective 7. To promote within the limits of managing OY, domestic marketing of the management unit species in American Samoa Guam, NMI and Hawaii.

2.0 CHAPTER TWO: DESCRIPTION OF THE ENVIRONMENT

This chapter describes components of the environment related to marine resources found in the NWHI. Where possible, trends in the condition of resources, ecosystems, fisheries, and human communities have been identified. This information provides the baseline and historical context needed to evaluate, in Chapter 4, the potential environmental consequences of each of the alternatives considered by the Council.

2.1 Physical Environment

Geographic Setting: In the central North Pacific Ocean, roughly 2,500 miles southwest of North America, lies the Hawaiian Archipelago. This 137-island chain stretches nearly 1,500 miles from Kure Atoll in the northwest to the island of Hawaii in the southwest. The NWHI comprise roughly 1000 miles of the 1,500 mile archipelago, and are composed of volcanic islands, atolls, shoals, and submerged banks. Contrary to statements that the NWHI contain 70 percent of US coral reefs (Executive Order 13178, 2000), recent evaluations of potential coral ecosystems in the United States have found that the NWHI contain less than 5 percent of the nation's potential shallow-water tropical and subtropical coral ecosystems when this area is defined as areas within the 10-fathom depth curve, and less than 10 percent of the nation's total when this area is defined as areas within the 100-fathom depth curve (Rohmann et al. 2005).

The closest NWHI island to the MHI is Nihoa, which lies nearly 150 miles northwest of Kauai. Nihoa is a volcanic island with two distinct peaks and steep sea cliffs. The next island to the northwest is Necker, which is volcanic island resembling the shape of a fish hook. Continuing west is French Frigate Shoals, an eighteen mile wide crescent shaped atoll. French Frigate Shoals has two exposed volcanic rocks and twelve low sandy islets. Northwest of French Frigate Shoals is Gardner Pinnacles, which consists of two emergent volcanic rocks. Next is Maro Reef, which is mostly a submerged atoll with very little emergent land.

Continuing up the chain is Laysan, the largest island in the NWHI, which is vegetated and even contains an hypersaline (extremely salty) lake. Northwest of Laysan is Lisianski Island, made up of low sand and coral, and located at northern end of a large submerged bank. Pearl and Hermes Reef, northwest of Lisianski, is a large atoll with several small islets that occasionally are submerged during storm activity. Continuing northwest is Midway Atoll, which includes three small islands surrounded by a large barrier reef. Kure Atoll, the northernmost coral atoll in the world, is surrounded by a barrier reef and contains an emergent land area known as Green Island. Between the emergent land areas described above are several submerged banks such as Brooks Bank, Raita Bank, St. Rogatien Bank, etc., which provide habitat for a variety marine resources.

Oceanographic Setting: The archipelago's position in the Pacific Ocean lies within the clockwise rotating North Pacific Subtropical Gyre (NPSG), a major surface current feature of the Pacific Ocean. Within the NPSG, the westward flowing northern edge of North Equatorial Current (NEC) grazes the Hawaiian Islands, mainly near the Big Island. The North Hawaiian Ridge Current (NHRC) can be thought of as a small part of the NEC that turns northwest to flow along the windward side of the chain instead of turning southwest to pass south of Hawaii Island (E. Firing, personal communication). Ten years of shipboard acoustic Doppler current profiler data collected by the NOAA shows a mean westward flow of the NHRC through the ridge between Oahu and Nihoa, and extending along the lee side of Nihoa and Necker to depths from 20 to 250 m (Firing and Brainerd, 2006, in press).

The Subtropical Counter Current (STCC) is an eastward flowing surface current found typically along 24°N from 130°E to 160°W. The eastward flowing Hawaiian Lee Counter Current (HLCC) is generally located along 20°N and extends from about 150°E to just west of the Hawaiian Islands (Kobashi and Kawamura 2002). The formation of the STCC and HLCC have recently been attributed to the "wake effect" that results from the combination of the westward trades winds steadily blowing over the Hawaiian Archipelago.[2]

Generally within the lee of the archipelago there are an abundance of mesoscale eddies created from a mixture of wind, current, and sea floor interactions. The eddies, which can rotate either clockwise or counter clockwise, have important biological impacts, and most likely play a more important role in larval transport than mean surface currents (E.Firing, per. com).. Eddies create vertical fluxes, with regions of divergence (upwelling) where the thermocline shoals and deep nutrients are pumped into surface waters enhancing phytoplankton production, and also regions of convergence (downwelling) where the thermocline deepens.

Sea surface temperatures around the Hawaiian Archipelago experience seasonal variability, but generally vary between 18°-28° C (64°-82° F) with the colder waters occurring more often in the NWHI. The NWHI are unique in that they contain the northernmost coral reef ecosystem (Kure Atoll) on the planet. The water temperatures experienced there are assumed to be the lower limit for corals to thrive and reefs to grow. Grigg (1982) suggests that Kure Atoll lies at the "Darwin Point" for reef development, a geographical limit beyond which corals and coralline algae can no longer deposit enough calcium carbonate to keep up with the subsidence of the area's volcanic base. It is theorized that reefs at latitudes higher than the Darwin Point fail to remain at sea level and sink below the photic zone within which growth can occur (Grigg 1982).

The Hawaiian Archipelago is subject to large storms and high wave energy produced from weather systems generated off the Aluetian Islands and other areas of the North Pacific. Such storms and waves can have major effects on the nearshore environment. For example, a major storm in the NWHI can break off pieces of coral, move underwater boulders, shift large volumes of sand, and erode islands. Such large perturbations in the shallow benthic habitat that result from the action of winter storms and swells are common in the NWHI.

Also due their position in the North Pacific, the NWHI act as a sink for a multitude of marine debris originating from Pacific-rim countries. Perhaps the most damaging type of this debris is in the form of derelict fishing gear such as nets and rope that are carried by ocean currents from both domestic and international North Pacific trawl fisheries. Other types of debris include materials made from rubber and plastics (e.g. lighters). Marine debris impacts the nearshore environment of the NWHI by choking and breaking coral reefs, entangling marine life, and

[2] http://science.nasa.gov/headlines/y2002/10apr_hawaii.htm

carrying invasive species. Since 1996, NMFS has led a multi-agency cleanup effort that has removed nearly 450 mt of derelict fishing nets and other debris from the NWHI (Asher, 2005, pers. comm.) In recent years, the effort has removed over 100 tons of marine debris per year. The amount of marine debris accumulating each year in NWHI is unknown, but is thought to be substantial.

Significant sources of interannual physical and biological variation are the *El Niño* and *La Niña* events. During an *El Niño,* the normal easterly trade winds weaken, resulting in a weakening of the westward equatorial surface current and a deepening of the thermocline in the central and eastern equatorial Pacific. Water in the central and eastern equatorial Pacific becomes warmer and more vertically stratified with a substantial drop in surface chlorophyll.

Physical and biological oceanographic changes have also been observed on decadal time scales. These low frequency changes, termed regime shifts, can impact the entire ocean ecosystem. Recent regime shifts in the North Pacific have occurred in 1976 and 1989, with both physical and biological (including fishery) impacts (Polovina, 1996; Polovina et al., 1995). In the late 1980's for example, an ecosystem shift from high carrying capacity to low carrying capacity occurred in the NWHI. The shift was associated with the weakening of the Aleutian Low Pressure System (North Pacific) and the Subtropical Counter Current. The ecosystem effects of this shift were observed in lower nutrient and productivity levels and decreased abundance of numerous species including the spiny lobster, the Hawaiian monk seal, various reef fish, the red-footed booby, the red-tailed tropic bird (Polovina and Haight, 1999; Demartini et al., 2002).

2.2 Biological Environment

The following is a general description of the life history, distribution, habitat characteristics of managed fishery stocks in the NWHI. Also discussed are the current status and impacts on essential fish habitat and protected species. A general description of Hawaii's fisheries is also provided.

2.2.1 Bottomfish and Seamount Groundfish Stocks

The bottomfish fisheries in Hawaii target an assemblage of species from the taxonomic groups Lutjanidae (Snappers), Serranidae (Groupers), Carangidae (Jacks), and Lethrinidae (Emperors). The seamount groundfish fishery when extant targeted the armorhead *(Pseudopentaceros richardsoni*) and the alfonsin (*Beryx splendens*). Table 1 presents the management unit species (MUS) which are listed under the Bottomfish and Seamount Groundfish FMP.

Table 1: Bottomfish and Seamount Groundfish Management Unit Species

COMMON NAME	SCIENTIFIC NAME
Snappers:	
Silver jaw jobfish	*Aphareus rutilans*
Grey jobfish	*Aprion virescens*
Squirrelfish snapper	*Etelis carbunculus*
Longtail snapper	*Etelis coruscans*
Blue stripe snapper	*Lutjanus kasmira*
Yellowtail snapper	*Pristipomoides auricilla*
Pink snapper	*Pristipomoides filamentosus*
Yelloweye snapper	*Pristipomoides flavipinnis*
Snapper	*Pristipomoides sieboldii*
Snapper	*Pristipomoides zonatus*
Jacks:	
Giant trevally	*Caranx ignoblis*
Black jack	*Caranx lugubris*
Thick lipped trevally	*Pseudocaranx dentex*
Groupers:	
Blacktip grouper	*Epinephelus fasciatus*
Sea bass	*Epinephelus quernus*
Lunartail grouper	*Variola louti*
Emperor fishes:	
Ambon emperor	*Lethrinus amboinensis*
Redgill emperor	*Lethrinus rubrioperculatus*
Seamount groundfish:	
Alfonsin	*Beryx splendens*
Ratfish/butterfish	*Hyperoglyphe japonica*
Armorhead	*Pseudopentaceros richardsoni*

Life History

Relatively little is known about the reproduction and early life history of deepwater bottomfish in the region. Spawning occurs over a protracted period, and peaks from July to September (Haight et al. 1993). The eggs are released directly into the water column. The eggs hatch in 3 to 4 days, and the planktonic larval phase is thought to last at least 25 days (Leis 1987). For some species this phase may be considerably longer. For example, the pelagic stage for *ōpakapaka* is thought to be as long as six months (Moffit and Parrish 1996). While preliminary genetic work corroborates the notion of single archipelago-wide stocks of bottomfish, the extent of larval mixing between the NWHI and MHI is unclear. Larval advection simulation research indicates that larval exchange may occur throughout the Hawaiian archipelago, but that bottomfish larval transport most likely occurs from the more northerly Ho'omalu zone to the Mau zone at the southern end of the NWHI, in addition to larval transport from the MHI to the Mau zone (Kobayashi 1998). Kobayashi (1998) found that very little bottomfish larvae are transported into the Ho'omalu or MHI from other areas (most mixing is in the mid-NWHI). Experimental work at the Hawaii Institute of Marine Biology found that 'ōpakapaka eggs incubated at temperatures characteristic of adult habitat did not hatch, but those incubated in water at surface temperatures hatched and were reared for up to four months (C. Kelly, HURL, personal communication).

At the pass between the main and the Northwestern Hawaiian Islands there is often a westward flow from the region of Kauai along the lee side of the lower NWHI. This flow, the North Hawaiian Ridge Current (NHRC), is extremely variable and can also be absent at times. While the high variability of the NHRC certainly allows for the possibility of direct larval transport toward the MHI, the mean currents indicate that direct larval recruitment is more likely from the MHI to the NWHI (Firing and Brainerd, 2006, in press).

Little is known of the life history of the juvenile fish after settling out of the plankton, but research on *P. filamentosus* indicates the juveniles utilize nursery grounds well away from the adult habitat (Parrish 1989). Most of the target species have a relatively high age at maturity, long life span, and slow growth rate.

Habitat and Distribution

Generally, deepwater bottomfish inhabit the deep slopes of island coasts and banks at depths of 100 to 400 m.[1] . Throughout their spatial and depth range, deepwater snappers are typically distributed in a clumped pattern, and are often associated with underwater headlands and areas of high relief. Although deepwater snappers are generally thought of as top level carnivores, several snapper species in the Pacific are known to incorporate significant amounts of zooplankton in their diets (Haight et al. 1993).

[1] *Uku* is a targeted BMUS, often caught at shallower depths than deepwater snappers using trolling methods rather than bottomfish fishing gear.

Status of the Stocks

Bottomfish Stocks

Hawaii's bottomfish are managed as a single archipelagic-wide multi-species stock complex, however, bottomfish fisheries in the Hawaii Archipelago occur in two broad management areas, the Northwestern Hawaiian Islands and the Main Hawaiian Islands (MHI). On an archipelagic basis, targeted bottomfish stocks are generally healthy. However, MHI bottomfish stocks have shown signs of stress and overfishing. On the basis of fishery information analyzed by NMFS' Pacific Islands Fisheries Science Center (PIFSC), NMFS's Pacific Islands Regional Office (PIRO) has determined that overfishing of the bottomfish species complex is occurring within the Hawaii Archipelago. The Regional Administrator for PIRO notified the Council of this overfishing determination on May 27, 2005. Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, the Council is required to take action to amend the Bottomfish and Seamount Groundfish Fishery Management Plan (FMP) within one year following NMFS' notification of the bottomfish overfishing. NMFS has determined that the bottomfish overfishing condition is due to excess fishing effort occurring primarily in the MHI and, therefore, reducing fishing mortality (effort) in the MHI bottomfish fishery is the most effective means to end the overfishing in the Hawaii Archipelago. The Council is now considering a range of management measures that target a 15 percent or greater reduction in fishing mortality in the MHI deep-water bottomfish complex which has been determined to be the level of reduction necessary to end overfishing in the Hawaii Archipelago.

Based on 2002 fishery catch and effort data analyzed by PIFSC, Appendix 5 to the 2003 Bottomfish and Seamount Groundfish Annual Report[3] indicated that overfishing is occurring in the Hawaii Archipelago because the ratio of current fishing mortality (F) to estimated fishing mortality at maximum sustainable yield (F_{MSY}) exceeded the MFMT of 1.0. Hawaii's archipelagic bottomfish F ratio is obtained by adding the weighted F contributions of the three management zones (MHI, Mau and Ho'omalu) by using effort—amount of bottomfish fishing gear used over a given unit of time—as a proxy for fishing mortality. The archipelagic values also include a weighted factor based on the amount of bottomfish habitat in each management zone. These factors are 0.447, 0.124 and 0.429 for the MHI, Mau and Ho'omalu Zones, respectively.

Using 2002 fishery data and the weighted factors for each zone, Appendix 5 to the bottomfish annual report stated that the archipelagic F ratio was between 1.14-1.35, above the overfishing threshold of 1.0. As reported in Appendix 5, the individual F ratios for the MHI, Mau and Ho'omalu Zones were 1.86-2.33, 1.19, and 0.37, respectively. Since the completion of Appendix 5 in April 2005, PIFSC has received the full set 2003 bottomfish fishery data from the State of Hawaii's Division of Aquatic Resources. Based on 2003 bottomfish fishery statistics and the weighted factors for each zone, the archipelagic F ratio is determined to be 1.13, above the overfishing threshold of 1.0. Individual F ratios for MHI, Mau and Ho'omalu Zones are 1.88, 0.96 and 0.39, respectively (see Appendix B for more information). More recently, NMFS has reassessed this fishery and data indicate that the status of NWHI stocks is improving (PIFSC in press).

Seamount Groundfish Stocks

Three species of seamount groundfish (amorhead, alfonsin, and rat fish, respectively) are included as BMUS in the FMP. These deepwater species primarily occur at depths of 275 - 500 m at Hancock Seamount, which is located 2,800 km northwest of Honolulu. The seamount species generally occur at higher latitudes, and below the depth range of the snapper-grouper bottomfish species complex. The armorhead and alfonsin spawn free-floating eggs which are dispersed by the North-equatorial and Kuroshio currents. Juvenile fish remain in the pelagic environment for up to a year, and then descend to seamount summits and begin a demersal existence. These species feed on species associated with the deep-scattering layer (euphausids, copepods, shrimps, myctophids, etc.) and make vertical migrations at night to follow their prey.

Since the seamount-wide crash of the armorhead trawl fishery in 1975, CPUE values have remained depressed and typically far below the 20 percent SPR overfishing threshold both at the Hancocks and outside the U.S. EEZ. Although in 1992 a dramatic increase in armorhead CPUE and SPR occurred at seamounts outside the U.S. EEZ, these values declined to very low levels by 1994 and remained depressed through 2002. This 1992 event further indicates that any large seamount-wide recruitment peak are likely to be episodic and can originate even at low stock levels (the 1989 parental stock had the lowest SPR values both inside (1.0 percent) and outside (0.3 percent) the U.S. EEZ). However, this stock increase was effectively reduced, apparently by increased fishing pressure outside the U.S. EEZ, to the previous low level in a matter of two years. The Japan trawl fleet continues to trawl the SE-NHR seamounts outside the U.S. EEZ as these trawlers pass through this area on their way to and from other trawl fisheries in the Pacific. Besides Japan, other Asian nations appear to be fishing the SE-NHR seamounts outside the U.S. EEZ although information remains anecdotal.

The Hancock Seamount groundfish fishery was closed by the Council and NMFS in 1986. As the armorhead stocks near the Hancock Seamounts have yet to recover, the Council and NMFS extended the 6-year fishing moratorium at the Hancock Seamounts until August 31, 2010.

2.2.2 Crustacean Stocks

Table 2 lists the MUS managed under the Crustaceans FMP.

Table 2: Crustaceans Management Unit Species

COMMON NAME	SCIENTIFIC NAME
Spiny lobster	(*Panulirus marginatus* or *Panulirus penicillatus*)
Slipper lobster	*family Scyllaridae*
Kona crab	*Ranina ranina*

Crustacean fisheries in Hawaii primarily target lobster species of the taxonomic groups Palinuridae (spiny lobster) and Scyllaridae (slipper lobster). Historically, the majority of the lobster catch in the region is taken in the NWHI fishery which targets two species: the endemic Hawaiian spiny lobster, Panulirus marginatus, and the common slipper lobster Scyllarides squammosus. Three other species, the pronghorn spiny lobster (*Panulirus penicillatus*), ridgeback slipper lobster (*S. haanii*) and the Chinese slipper lobster (*Parribacus antarcticus*) are caught incidentally and in low abundance in the NWHI fishery.

Life History

Reproduction: The spawning period of *P. marginatus* in the NWHI extends over a broad period from early spring to late summer. Ovigerous females are found predominantly in the northern portion of the NWHI during early summer and in the central portion during late summer. But in the MHI around O'ahu, spawning occurs throughout the year, peaking during May-August (Uchida et al. 1980; McGinnis 1972). The eggs are carried externally and hatch after 30-40 days (MacDonald and Stimson, 1980). Fecundity is positively correlated with body size, and can be expressed as Fecundity = 6.5334(CL) 2.3706 (Honda 1980; DeMartini et al. 1993). It is estimated that the largest ovigerous females can carry over 1 million eggs (Honda 1984). After hatching, the larvae (phyllosoma) are planktonic for up to 12 months (Polovina and Moffitt 1995) undergoing metamorphosis through 11 discrete larval stages (Johnson 1968). The temporal distribution of late stage larvae in survey trawls in the NWHI appears to corroborate the 12-month larval cycle (Polovina and Moffitt 1995). Late-stage phyllosoma develop into a free-swimming stage known as a puerulus which actively seeks suitable benthic habitat (Cooke and MacDonald 1982). Puerulus settlement appears to occur in a series of pulses correlated with the lunar cycle, mostly during the new moon or first quarter of the lunar cycle (MacDonald 1986). Field studies in the NWHI and around Oahu indicate that puerulus settlement is oppositely seasonal at the north end of the NWHI versus Oahu, occurring sporadically throughout the year in the central portion of the NWHI (MacDonald 1986). Peak settlement around Oahu occurred during the winter months (October-April) in contrast to the summer peak at Kure Atoll (May-September); at French Frigate Shoals settlement occurred sporadically throughout the year (MacDonald 1986). After settlement the puerulus molts into a post-puerulus stage and gradually attains adult coloration.

Female lobsters of the genus Scyllarides have never been observed with spermatophora similar to those found in Panulirus, suggesting fertilization may be internal. Of 1,090 slipper lobster females collected during NWHI lobster surveys, none had a spermatophoric mass although 33 percent were ovigerous (Uchida and Uchiyama 1986). Research at PIFSC on reproduction in NWHI lobsters has focused primarily on spiny lobster; therefore, reproduction parameters for Sycllarides spp. in the NWHI are not well known. Analysis of recent research survey data indicates ovigerous female *S. squammosus* are found during the months of March through September. Peak spawning appears to occur from April to June (Haight unpubl. data).

Growth and Mortality: Several studies encompassing a variety of methods have provided basic life history parameters for spiny lobster in the NWHI. Based on analysis of recaptures of tagged lobsters at O'ahu (McGinnis 1972) and Necker (Uchida and Tagami 1984) the growth parameter k ranges in value from 0.269 for O‘ahu males to 0.3857 for O‘ahu females, and 0.26 for Necker males. Tagging at Kure Atoll and FFS resulted in k estimates of 0.27 and 0.3 for those locations (MacDonald 1984). Length frequency analysis of spiny lobster at Necker Island resulted in a k estimate of 0.3 for that location (Polovina and Moffitt 1989). The results of MacDonald's (1984) tagging study suggested that the natural mortality rate was higher for female spiny lobsters than for males at both Kure Atoll and FFS. Based on this study, the coefficient of natural mortality for both sexes combined was 0.49. Natural mortality estimates from mathematical modeling of commercial catch and effort data appear to corroborate the rate of natural mortality estimated from tagging research (Haight and Polovina 1992). Asymptotic length ($L\infty$) based on tagging and length frequency analysis ranges from 12.4 cm CL (Uchida and Tagami 1984) to 13.4 cm CL (MacDonald 1984; Polovina and Moffitt 1989). It appears that $L\infty$ may fluctuate with changes in lobster density, having increased at both Maro Reef and Necker Island after the fishery reduced the population density (Polovina 1989). Based on tagging studies at Kure Atoll and FFS, MacDonald (1984) estimated the average individual lifespan of spiny lobster in the NWHI at 7.4 years.

Two different approaches have been used to estimate size at sexual maturity for spiny lobster in the NWHI. Prescott (1984) used changes in allometric growth of the walking legs as an indicator of sexual maturity for lobster at O‘ahu and Necker Island. Estimates for the size at maturity were 58.6 mm CL for O‘ahu females and 60.07 for Necker females. Polovina (1989) used a hyperbolic tangent function applied to size frequency from annual research trapping to determine the size at which 50 percent of the female lobsters were ovigerous. Based on this approach, females at Necker Island were found to attain sexual maturity at 57.9 mm CL (based on 1985-86 data), a result similar to that from the allometric growth analysis. Analysis of temporal maturity data indicates that size at sexual maturity fluctuates with changes in population density. Polovina (1989) found that the size at sexual maturity from Necker Island and Maro Reef declined from 1977 to 1987. Both of the areas received heavy fishing pressure during this time period which reduced lobster densities. The change in the size at sexual maturity seems to reflect a density-dependent response rather than genetic selection resulting from fishing pressure. Seeb et al. (1990) examined the genetic variability of the NWHI spiny lobster population and found no measurable loss of genetic variability due to fishing pressure. The sex ratio of adult spiny lobster in the NWHI appears to slightly favor males (Uchida and Tagami, 1984). MacDonald's (1984) tagging research indicated that male mortality rates were lower than those for females at the banks examined; therefore, differential mortality might account for the predominance of males in the catch. Genetics may also be a factor in the male to female ratio. Shaklee and Samollow (1980) found that of 2,060 pre-hatch embryos, 52 percent were male.

Based on the size composition of the unexploited population calculated from carapace length frequency distributions, the smallest lobsters occurred at Necker Island and the largest at Kure Atoll. The same data indicated that males were larger than females in all localities except Lisianski Island where the sample size was too small to provide a statistically valid sample (Uchida and Tagami, 1984).

Habitat and Distribution

Spiny and slipper lobster occur throughout the tropical oceans of the world (Cobb and Phillips 1980). P. marginatus is endemic to the Hawaiian Islands and Johnston Atoll (Brock 1973) and appears to be closely related to the long-legged spiny lobster, P. longipes, which is widely distributed in the Indo-West-Pacific (Pollock 1992). Genetic studies indicate that a single genetically homogenous population of spiny lobster occurs in the NWHI (Shaklee and Samollow 1980); however, variation in a single gene locus between lobster populations at Necker Island and Maro Reef indicate that it is likely lobster from these two areas are somewhat reproductively isolated (Seeb et al. 1990). Larval research surveys conducted throughout the tropical Pacific during the 1950s and 1960s found late-stage phyllosoma of P. marginatus only in waters near the Hawaiian Archipelago and Johnston Island (Johnson 1968). The distribution of phyllosoma around the Hawaiian Archipelago appears to be relatively homogenous, and the temporal distribution of late stage larvae is indicative of a summer spawning season and a 12-month larval cycle (Polovina and Moffitt 1995).

Adult and juvenile Hawaiian spiny lobsters occur throughout the NWHI from Nihoa Island to Kure Atoll (Uchida and Tagami 1984) at depths of 4-174 m (Uchida and Uchiyama 1986). In Hawaii, adult spiny lobsters are typically found on rocky substrates in well-protected areas such as crevices and depressions in coral reef habitat. Although the Hawaiian spiny lobster inhabits waters up to 200 m in depth, most of the catch is taken from water depths less than 60 m. In an extensive resource survey conducted by the NMFS during the 1970s, populations of spiny lobster were found at 18 (69 percent) of the banks in the NWHI extending from Nihoa Island to Kure Atoll. No P. marginatus were found at the banks north of Kure Atoll (Uchida and Tagami 1984). Within the Hawaiian Archipelago, lobster abundance, size, and species ratio varies widely between islands and banks. Variations in abundance and species composition between banks is related to various environmental and biological factors including length of larval cycle, advection of larvae by oceanographic processes, availability of juvenile refuge habitat, and suitability of adult habitat.

Although adult spiny lobsters occur as deep as 174 m in the NWHI, it appears that juvenile spiny lobster do not settle onto banks with summits deeper than 30 m and that the amount of habitat with vertical relief of 5-30 cm may limit total distribution and abundance (Parrish and Polovina 1994). At Necker Island, juvenile spiny lobster (<age-3) appear to occupy the same or similar habitat as the adults (Parrish and Polovina 1994), which increases their probability of being caught in the commercial fishery. At Maro Reef, juvenile lobsters appear to utilize shallow reef areas not associated with fishing. In 1993, an area of high juvenile abundance was located during exploratory research trapping in the shallows of Maro Reef (Haight and Polovina 1993). During 1994, the same lagoonal areas were fished, and the area of high juvenile abundance was extensively surveyed. Age-specific catch per unit effort (CPUE- defined as number of lobsters per trap fished) values from inside Maro Reef were significantly higher than the CPUE values from outside the reef. Of the shallow lagoon areas trapped in 1994, only the northwestern reef spur exhibited high juvenile CPUE values. It appears that the juvenile lobster are associated with the northern portion of the reef spur and are more abundant in shallow waters next to the spur (Haight 1998).

Unlike many other species of Panulirid lobster, juveniles of the Hawaiian spiny lobster do not recruit to distinctive “nursery” areas but instead utilize areas within the adult habitat. Adult spiny lobster in Hawaii release eggs into the water column beginning in the early spring of each year, with spawning reaching a peak in the middle of the summer. The planktonic larval phase of P. marginatus may last up to 12 months, during which time oceanic processes act to disperse and/or concentrate the larval pool. The dynamics of this advection process and the oceanographic and physiographic features which result in the retention of lobster larvae within the Hawaiian Archipelago are poorly understood. Recent research suggests that meso-scale oceanographic features such as eddies, gyres and geostrophic currents are critical components in determining if the larvae will be transported to areas suitable for recruitment (Polovina et al. 1999). These oceanographic features vary from year to year and may be influenced by cyclic, large-scale oceanographic processes as well (Polovina and Haight 1999). Because adult lobster are benthic and the islands and banks in the archipelago are separated by water depths of over 1000 m, each individual sub-population of lobster is effectively isolated from the sub-populations at other banks and islands in the Hawaiian Archipelago. The total lobster population in the archipelago therefore exists as a series of isolated spawning populations which all contribute to the total larval pool. The function of each island or bank as a source or sink for population production is important in the understanding of the dynamics of the population as a whole. Unfortunately, these aspects of lobster population biology are not well known.

Scyllarides squammosus is found in localized areas throughout the Indo-West-Pacific region. Resource surveys conducted by the NMFS documented the presence of S. squammosus at 17 (65 percent) of the NWHI banks from Nihoa Island to Kure Atoll at depths of 13-137 m (Uchida and Uchiyama 1986). During the initial research survey, slipper lobster catch was higher than spiny lobster catch at Brooks Bank, Northampton Seamounts, Lisianski Island, and Salmon Bank. However, slipper lobster comprised only 16 percent of the resource survey catch for the NWHI as a whole (Uchida and Uchiyama 1986).

Status of the Stocks

The relative distributional abundance of spiny lobster in the NWHI remained fairly constant from 1976 to 1989. Although lobsters were commercially trapped at up to 15 separate locations in the NWHI, five areas (Necker Island, Gardner Pinnacles, Maro Reef, St. Rogatien Bank, Brooks Bank) produced the majority of the catch throughout the period. After 1990, however, only Necker Island, Maro Reef and Gardner Pinnacles appeared to have lobster abundances suitable for commercial exploitation.

Data on the size structure of the NWHI lobster population since fishery exploitation began were collected by the PIFSC on annual assessment cruises from 1985 to 1995. By using age-specific CPUE values as an indicator of relative abundance, recruitment of spiny lobster to specific banks can be examined. At Maro Reef from 1985 through 1988, CPUE was highest for age-3 spiny lobster. Commercial effort at Maro Reef remained fairly constant during 1985-89 (average effort = 350,000 trap-hauls); the associated high CPUE values of age-3 lobsters at Maro Reef indicates recruitment remained stable during the time period. By 1990 a dramatic decrease in CPUE for all age classes at Maro Reef was apparent. The CPUE values for age-2 and age-3 spiny lobster dropped 90 percent from 1988 to 1990. In 1991, CPUE values for age-2 and age-3 lobsters declined another 80 percent and 67 percent, respectively. The low CPUE values during 1990-91 were not caused by commercial exploitation alone, as commercial effort at Maro Reef dropped 45 percent from 1988 to 1990 and another 80 percent in 1991. The dramatic reduction in CPUE of all age classes at Maro Reef in 1990 may be attributed to poor post-larval recruitment of spiny lobster to Maro Reef beginning in 1986, which was compounded by commercial fishing harvest. Further reduction in age-specific CPUE of age-2 and age-3 spiny lobster in 1991, and the associated very low commercial CPUE prior to the 1991 research cruise, indicate poor recruitment of spiny lobster to Maro Reef continued during the years of 1987-88. The depressed CPUE continued from 1991 through 1995. This trend has persisted despite significant reductions in commercial fishing effort at Maro Reef during 1991-92 and 1994, and a fishery closure in 1993.

A similar trend was observed 70 nm to the northwest at Laysan Island (Haight and Polovina 1992), which has been closed to commercial harvest since the beginning of the commercial fishery. In contrast, recruitment of age-2 lobster to Necker Island, 360 nm southeast of Maro Reef, remained fairly constant throughout the time series. Polovina and Mitchum (1992) found recruitment of spiny lobster to Maro Reef to be correlated with the strength of the subtropical countercurrent, suggesting that mesoscale oceanographic features may impact the transport and survival of lobster larvae during their 11- to 12-month pelagic larval cycle. Continued recruitment of spiny lobster to Necker Island suggests that the lower southeastern end of the NWHI is not linked to the same oceanographic or recruitment processes as the northwestern end of the archipelago. The genetic variation in lobster from the two different areas appears to corroborate this hypothesis (Seeb et al. 1990). Because the oceanographic processes which appear to affect recruitment at the northwestern portion of the NWHI occur in approximately decadal cycles (Polovina and Mitchum 1992; Polovina et al. 1995), the spiny lobster stocks may remain at the present level of production for several years.

The Crustaceans FMP has defined overfishing using SPR values and the 20 percent critical threshold.In 1997, when the last SPR values were calculated for this fishery, the SPR values were 74 percent, well above the 0.20 overfished threshold. However, the productivity of lobster stocks appears to have substantially decreased from the level when the fishery began. For example, NMFS research surveys at Necker Island indicate more than 80 percent drop in mature spiny lobster CPUE, from 4.2 to 0.5 between 1988 and 1999. Changes in environmental conditions compounded by fishery harvest are believed to have contributed to this decline (Polovina and Haight 1999). PIFSC is working on a new stock assessment model which will allow for more accurate lobster population estimates. Currently, slipper lobsters occur in greater abundance in the NWHI than do spiny lobsters (Dinardo, 2005)

2.2.3 Precious Coral Stocks

Precious corals MUS include any coral of the genus Corallium and the other species listed in Table 3.

Table 3: Precious Corals Management Unit Species

COMMON NAME	SCIENTIFIC NAME
Pink coral	*Corallium secundum, Corallium regale,* or *Corallium laauense*
Gold coral	*Narella spp. Gerardia spp.*, or *Calyptrophora spp*
Bamboo coral	*Lepidisis olapa* or *Acanella spp*
Black coral	*Antipathes dichotoma*, *Antipathes grandis*, or *Antipathes ulex*

Life History

In general, precious corals share several ecological characteristics: they lack symbiotic algae in tissues (they are ahermatypic) and most are found in deep water below the euphotic zone; they are filter feeders; and many are fan shaped to maximize contact surfaces with particles or microplankton in the water column. Because precious corals are filter feeders, most species thrive in areas swept by strong to moderate currents (Grigg 1993). Although precious corals are known to grow on a variety of hard substrate, they are most abundant on substrates of shell sandstone, limestone, or basaltic rock with a limestone veneer.

All precious corals are slow growing and are characterized by low rates of mortality and recruitment. Natural populations are relatively stable, and a wide range of age classes is generally present. This life history pattern (longevity and many year classes) has two important consequences with respect to exploitation. First, the response of the population to exploitation is drawn out over many years. Second, because of the great longevity of individuals and the associated slow rates of turnover in the populations, a long period of reduced fishing effort is required to restore the ability of the stock to produce at the maximum sustainable yield (MSY) if a stock has been over exploited for several years.

Because of the great depths at which they live, precious corals should be insulated from some short-term drastic changes in the physical environment. For the same reason, it is difficult to imagine circumstances in which man-made pollution would affect their environment, except in the unlikely event that large quantities of heavy material, such as waste from manganese nodule refining, were dumped directly on a bed. Nothing is known of the long-term effects of changes in environmental conditions, such as water temperature or current velocity, on the reproduction, growth, or other life activities of the precious corals.

Taxonomy, Biology and Ecology: Precious corals MUS are taxonomically classified as members of the phylum Cnidaria, which includes all of the corals, hydroids, jellyfish and sea anemones. Its members are characterized by the presence of:

1. a sac-like body with only one opening for the gut;

2. only two tissue layers, an outer protective layer of epidermis and an inner digestive layer, the gastrodermis, lining the gut cavity;
3. an intermediate layer called the "mesoglea" or "middle jelly" consisting mostly of protein fibers and generally lacking cells; and
4. stinging devices called nematocysts used in either prey capture or defense.

Within the *Cnidaria*, precious corals are placed in the class *Anthozoa*, which includes the corals, soft corals and sea anemones, all characterized by having a relatively complicated gut, compared with other cnidarians. Living tissues are composed of polyps, each with a mouth surrounded by tentacles. Some species are composed of a single polyp while others are colonies of many polyps.

Within the *Anthozoa*, precious corals are members of three orders in two subclasses: 1) subclass *Octocorallia* (or *Alcyonaria*), order *Gorgonacea*, and 2) subclass *Hexacorallia* (or *Zoantharia*), orders *Zoanthidae* and *Antipathidae*.

Members of the subclass *Octocorallia* are characterized by their eight tentacles. All octocorals are colonial, with each colony consisting of numerous polyps growing out of, and constituting the body of, the animal. These are all connected by a complicated system of internal tubing running through the colonial mesoglea. Octocoral MUS include the pink corals of the genus *Corallium* and the bamboo corals of the genera *Lepidisis* and *Acanella*.

Other anthozoans have their tentacles in multiples of six and are thus termed the *Hexacorallia*, or hexacorals. Hexacoral MUS include gold corals of the order *Zoanthidea* and black corals of the order *Antipathidae*.

Red, pink and bamboo octocorals of the Order *Gorgonacea* are commonly called fan corals because their growth resembles that of a plant, with a main trunk fastened to the substrate, and lateral branching stems which may be in the same plane, hence the name "fan corals."
Their internal skeleton is decidedly different in structure and composition from the hard skeleton of the stony, reef-building, corals. Gorgonian skeletons contain a much larger proportion of organic material, much of it proteinaceous. This gives them much more flexibility than reef-building corals. They also tend to deposit a significant amount of pigmented material into the skeleton, resulting in some skeletons being highly colored. Brown, red, pink or gold are common colors found in gorgonian skeletons. Precious coral jewelry is made from the cut and polished skeletons of large gorgonians and similar corals.

Gorgonian colonies are all derived from one another and they are all one gender. The age at reproductive maturity is 12-13 years for *Corallium secundum*. Gorgonians of both sexes release gametes into the sea. Fertilization occurs in the sea and a small planula larva develops that chooses a place of settlement. Planula larvae of most corals are not usually dispersed very far from parent colonies. The larva then metamorphoses into a juvenile and the first polyp of the colony is formed. From this point the colony is fastened to the substrate and is immobile. In colonial species, a sexual reproduction also occurs through budding of the primary polyp. The duration of the larval stage is unknown for most species, but Mediterranean studies of *Corallium rubrum* suggest that their larvae remain competent for several weeks.

Corallium species live below the euphotic zone at depths between 100 and 1500 m where temperature varies between 3° and 18° C. These larvae may avoid settling deeper, where lower temperatures may prevent reproduction. As the colony grows, it generally differentiates so the "fan" is perpendicular to the prevalent currents. Growth of many octocorals is slow and they may require over 100 years to reach maximum size.

Little information is available on the ecological associations of the precious corals or their significance to the lives of other organisms. Gorgonians are predatory, suspension-feeding, animals that catch and kill small planktonic animals with their tentacles. Particulate organic matter is also important in the diets of Gorgonians, and like other Anthozoan species, they are associated with numerous kinds of commensal invertebrates.

Gorgonians have few predators. They are, however, the food of some polyp-plucking fish, such as filefish, and of grazing snails, several types of nudibranchs and at least one polychaete annelid. Eucidarid sea urchins are known to prey on precious corals. Gorgonians also provide vertical structure in a habitat where such structure is often lacking. Consequently, they are often settled on by barnacles and other epifauna. Gorgonians, in turn, have developed strong chemicals to deter fouling and predation.

Zoanthidea are a small group of hearty, solitary, sometimes colonial, anemone-like anthozoans that lack a skeleton. There is a large amount of morphological variability in this order, with most species being shallow-water and mat-forming. Some species are encrusting, and may overgrow other octocorals or hexacorals. They are unlike any other anthozoans internally, having a large number of paired and unpaired septa. Zoanthid polyps can occur as single individuals in large groups or they can be joined together by a thin stolon, a thin coenenchyme or a very thick coenenchyme from which only the mouths and tentacles are visible. The coenenchyme is a gelatinous mat of fibrous protein that develops from the mesoglea and supports the polyps.

Gold coral (*Gerardia* sp.) are Zoantharian corals that belong to the family *Parazoanthus*. Many are parasitic species that commonly overgrow other gorgonian corals. *Gerardia* seems to prefer overgrowing the bamboo corals (*Acanella* spp.). In fact, this association may be almost obligate as few colonies of Gerardia have been found without an *Acanella* base within the holdfast of the gold coral colony. In Hawaii, *Gerardia* sp. is found at depths between about 350 and 450 meters and prefers steep drop-offs. Typically it settles at the very top of drop-offs within this depth range where the current appears to be enhanced.

In the NWHI, monk seals have been observed (radio telemetry) to dive in areas where gold coral and arrowtooth eels may occur, suggesting that monk seals forage among precious corals because they provide structural relief for various fish assemblages. In 2000, the National Undersea Research Laboratory conducted a study using manned and unmanned submersibles in known beds of the Western Pacific region. The objective of the study was to test the hypothesis that gold coral provided habitat for deep-water arrowtooth eels. Results of the study found that gold coral did not seem to aggregate arrowtooth eels or any other significant fish assemblage. At the Cross Seamount, the study found arrowtooth eels in areas adjacent to the beds, but without the presence of gold corals (Parrish 2001).

In a study to test the possibility that NWHI precious corals beds aggregate fish assemblages, Parrish (2005, pers. comm.) found that in areas with taller colonies of precious corals (e.g. *Gerardia*) there were twice the fish density of adjacent areas without the corals, but the statistics of the study suggest that this was due to co-occurrence of corals and fish in areas of high relief and high current flow. The Parrish (2005, pers. comm.) study indicates that it is unlikely that fish depend on the corals for habitat, and that monk seal visitation to precious corals beds is thought to be incidental to the seals' targeting high-relief features where fish and precious corals co-occur.

Adult pink, bamboo and gold corals are found in deep water (100-1500 m) on solid substrate where bottom currents are strong. This is in contrast to black corals, discussed below, which also typically occur on solid substrate, but generally at depths between 30 and 110m.

Antipatharia contain the well known precious black or "thorny" coral. These tree-like corals have a thin axial skeleton with distinctive small thorns. A thin veneer of animal tissue, called the cenosarc, secretes the tightly-layered central skeleton of horn-like protein. Depending upon the species, the living tissue may be black, red, orange, brown, green, yellow or white. The gelatinous polyps located in this living "bark" are short and cylindrical, their six, non-retractable tentacles are armed with stinging cells.

More than 150 species of black corals have been described. Some, like the wire corals, grow as a single, spiral coil. Many others have a dendritic growth form, creating a fan shape or elaborate tangle of tree-like branches. At least 14 species of black corals are currently known from Hawaii.

Relatively little is known about the life cycle and reproduction of black corals. Like other cnidarians, black corals have life cycles that include both asexual and sexual reproduction. Asexual reproduction (budding) builds the colony by adding more living tissue that, in turn, secretes more skeleton. Regular growth rings laid down as the skeleton thickens can be used to estimate the age of the colony. Sexual reproduction involves the production of eggs and sperm to create young that can disperse and settle new areas. The larvae of several black coral species are negatively phototactic, and are most abundant in dimly lit areas, such as beneath overhangs and ledges in waters deeper than 30m. All species require firm, hard substrates free of sediment. Polyps are either male or female. The larval stage, called a planula, can drift with currents until a suitable surface is found. Once the larva settles, it metamorphoses into a polyp form and secretes skeletal material that attaches it to the seafloor. Then it begins budding, creating more polyps that will form a young colony. In one Hawaiian species that has been studied (Antipathes dichotoma, a MUS), the colony may grow about 2.5 inches (6.4 cm) per year. The age at reproductive maturity is 12-13 years for Antipathes dichotoma. Reproduction may occur annually. A large six-foot (1.8 m) tall coral tree is estimated to be between 30 and 40 years old. The oldest corals observed in the Maui Auau Channel Bed are thought to be 75 years old, and it is believed that black corals may live even longer (Grigg 1983).

Western Pacific precious coral larvae are more affected by light and temperature than are adults. Larvae of Antipathes species occurring in Hawaii are known to be negatively phototactic, which is why they are not found shallower than 30 m. The lower limit of the A. dichotoma and A.

grandis black corals coincides with the top of the thermocline in the high Hawaiian Islands (Grigg 1993).

Habitat and Distribution

Precious corals are known to exist in the EEZ around Hawaii and very likely exist in the EEZ around American Samoa, Guam, the Northern Mariana Islands and the remote U.S. Pacific Island possessions, but virtually nothing is known of their distribution and abundance in these areas outside of Hawaii. In America Samoa, there are three known areas with pink coral: near Upolu and Falealupo, and at Tupuola Bank (Grigg 1993). In the Northern Mariana Islands, Japanese fishermen have reported pink coral north of Pagen Island and near Rota and Saipan. Since these areas remain unsurveyed, no information is available regarding the abundance of coral present.

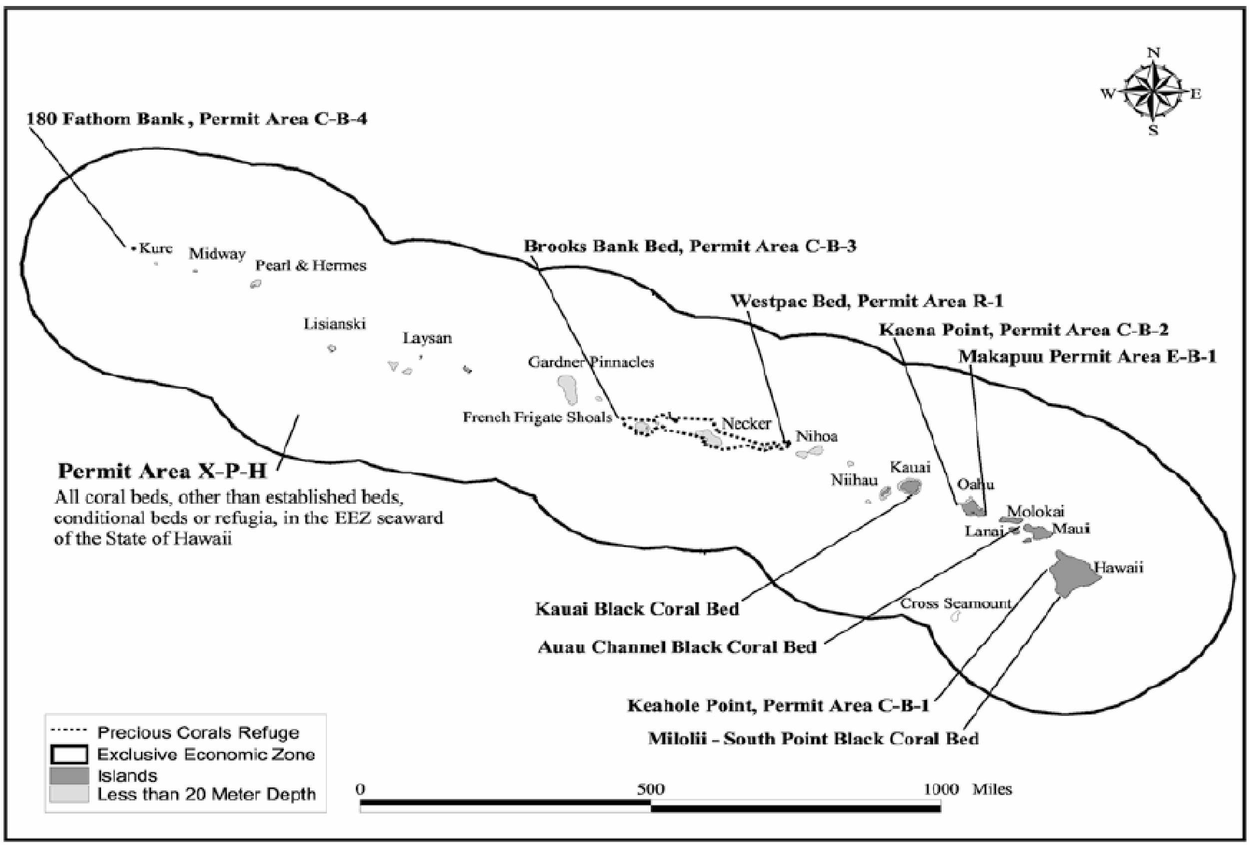

Figure 1: Precious Coral Beds in Hawaii

To date, beds of pink, gold and/or bamboo corals have been found eight locations in the EEZ around Hawaii. This number includes two recently discovered beds, one near French Frigate Shoals in the NWHI, and a second on Cross Seamount, approximately 150 nm south of Oahu (Figure 1). The approximate areas of six of these eight beds have been determined. These beds are small; only two of them have an area greater than 1 km², and the largest is 3.6 km² in size.

The Keahole Bed off Hawaii's Kona coast, however, is substantially larger than originally thought. Scientists and industry are currently assessing its actual size. Initial calculations appear to increase its size twenty-fold. There are also three known major black coral beds in the Western Pacific Region, in addition to several minor beds (Grigg 1998a). Most of these are located in Hawaii's state waters (0-3 nm). However the largest (the Auau Channel Bed) extends into federal waters of the EEZ.

There are undocumented and unconfirmed reports that precious corals have been observed or exploited in widely scattered locations in the Western Pacific Region: off American Samoa, Guam, the Northern Mariana Islands, and Wake Island, but no details are available. In some cases attempts at scientific surveys in areas referred to in such reports have failed to turn up any evidence of precious corals. Undocumented reports of large past commercial production by Japanese vessels on the Milwaukee Banks, some 500 miles beyond the northwestern extreme of the NWHI, and the large physical area of those banks, lead to conjecture that at some locations precious corals may occur in much larger aggregations than have as yet been demonstrated by scientific surveys. Asian coral fishers, who have roamed the western and central Pacific for decades, undoubtedly have undocumented and unorganized information on precious corals beds which has yet to be revealed to U.S. researchers and or resource managers. In general, the available information on precious corals occurrence and distribution is fragmentary and very incomplete, and there is a high probability that further surveying and prospecting will reveal significant additional precious corals resources in areas under U.S. jurisdiction.

Status of the Stocks

Precious Corals stocks in the NWHI are believed to be in relatively healthy condition. In 1965, Japanese coral fishermen discovered a large pink coral bed (*Corallium* spp.) on the Milwaukee Banks in the Emperor Seamount Chain near the northwestern end of the NWHI (Grigg 1993). Intermittently over the next two decades, dozens of foreign vessels employed tangle-net dredges to harvest precious corals in the waters around the NWHI. During the 1980's, Japanese and Taiwanese coral vessels frequently fished illegally in the EEZ near the Hancock Seamounts (Grigg 1993). In 1985, Taiwanese vessels reportedly poached about 100 mt of pink coral from north of Gardner Pinnacles and Laysan Island (Grigg 1993). The following are standing stock estimates of known precious coral beds in the NWHI.

Brooks Bank Conditional Bed: The harvest quota listed in the FMP for pink coral at Brooks Bank is 444 kg/yr.[2] This figure was calculated using the a formula provided in the FMP for setting the quota for Conditional Beds for which site specific data are unavailable. According to the Precious Corals FMP, the estimated MSY for pink coral at Makapu'u Bed is 1,000 kg/yr, the estimated area of Makapu'u Bed is 3.6 km^2 and the estimated area of Brooks Bank is 1.6 km^2. This bed was surveyed in September 1998. On this survey, 2.1 km-long transects were conducted at a depth of 350-505 m. Red coral *(C. regale*) was observed to be very abundant, with thousands of colonies present. Colonies occurred in 1-5 m^2 patches, and were located at depths of 430-517 m. These colonies were up to 50 cm in height and averaged 1 cm in diameter.

[2] The final rule implementing the Precious Corals FMP published on 20 August 1983 lists the harvest quota for pink coral at Brooks Bank as 17 kg. This is a typographical error.

Extrapolation of these data suggests that a conservative standing crop of 8,000 kg of *C. regale* exists at this bed (Grigg 1998b). If it is assumed that this species of precious coral has the same natural mortality rate as *C. secundum* at the Makapu‘u Bed (6.6 percent), an estimate of the MSY can be derived from the formula provided by Gulland (1970): MSY = 0.4MB, where M is the natural mortality rate and B is the standing crop biomass. Rounding down, it is estimated that 200 kg of *C. regale* could be harvested annually on a sustainable basis, based on these data and assumptions. Pink coral (*C. secundum*) was observed to be moderately abundant on the east side of the bank at depths of 363-427 m, but colonies were generally small (less than 20 cm in height). Gold coral was abundant with 250 large colonies found between 392-467 m. It was estimated that there was a standing stock of 2,000 kg of live gold coral, with an equal amount observed dead. Observations of finfish in the area were rare, and there was no evidence of predation by sea urchins at this bed.

Westpac Conditional Bed: This bed was also surveyed in 1998, using 3.2 km-long transects at depths of 360-500 m. No red coral was observed, however, pink coral was abundant, with thousands of colonies in 0.3-1.0 m^2 patches. Gold coral was rare, with only two colonies observed. Finfish (mostly Polymixia) were abundant, and there was high predation by Eucidarid sea urchins, with 50 percent of colonies showing signs of predation.

***French Frigate Shoals-Gold Pinnacles Exploratory Bed*:** The 1998 survey also located a previously unknown bed near French Frigate Shoals, which has been named the FFS-Gold Pinnacles Bed. No red coral (*C. regale*) was found along 2.9 km-long transects at depths of 360-575 m, and pink coral *(C. secundum*.) abundance was low. Observed pink coral was generally small, averaging less than 12 cm in height (Grigg 1998b). Both live and dead gold coral were found in abundance, and 300 colonies were observed in scattered patches at depths of 365-406 m. Extrapolation of the transect data suggests that the gold coral standing crop at the FFS-Gold Pinnacles Bed is 3,000 kg. If it is assumed that this species of precious coral has the same natural mortality rate as *C. secundum* at the Makapu‘u Bed (6.6 percent), an estimate of the MSY can be derived from the same formula provided by Gulland (1970) and given above. Rounding down, it is estimated that 80 kg of gold coral could be harvested annually on a sustainable basis based on these data and assumptions.

Table 4. Classification and Bounds of Precious Coral Beds

Bed	Location And Bounds	Area in km^2
Makapu’u (established)	Main Hawaiian Islands - the area within a radius of 2.0 nautical miles (nm) of a point at 21° 18.0 N lat., 157°32.5 W. long.	3.60
Keahole Point (conditional)	Main Hawaiian Islands - the area within a radius of 0.5 nm of a point at 19° 46.0 N. lat, 156° 06.0W. long.	0.24
Kaena Point (conditional)	Main Hawaiian Islands - the area within a radius of 0.5 nm of a point at 21° 35.4 N lat, 155° 22.9 W. long.	0.24
Brooks Bank (conditional)	Northwestern Hawaiian Islands - the area within a radius of 2.0 nm of a point at 24° 06.0N lat, 166° 48.0W. long.	1.6

Bed	Location And Bounds	Area in km^2
180 Fathom Bank (conditional)	Northwestern Hawaiian Islands - the area within a radius of 2.0 nm of a point at 28° 50.2N. lat, 178° 53.4W.long	0.8
Westpac Bed (refugium)	Northwestern Hawaiian Islands - the area within a radius of 2.0 nm of a point at 28° 50.2N lat, 162° 35.0W long	0.8
Exploratory permit area X-P-H	Hawaii - all coral beds, other than established beds, conditional beds, or refugia, in the EEZ seaward of the State of Hawaii.	unknown
Exploratory permit area X-P-AS	American Samoa - all coral beds, other than established beds, conditional beds, or refugia, in the EEZ seaward of American Samoa.	unknown
Exploratory permit area X-P-G	Guam - all coral beds, other than established beds, conditional beds, or refugia, in the EEZ seaward of Guam.	unknown
Exploratory permit area X-P-PI	Pacific Island Possessions - all coral beds, other than established beds, conditional beds, or refugia, in the EEZ seaward of the U.S. Pacific Island Possessions	unknown

2.2.4 Coral Reef Ecosystem Stocks

Coral reefs are carbonate rock structures at or near sea level that support populations of scleractinian or reef-building corals. Apart from a few exceptions, coral reefs are confined to the warm tropical and sub-tropical waters lying between 30° N and 30° S. Coral reef ecosystems some of the most diverse and complex ecosystems on earth. The symbiotic relationship between the animal coral polyps and algal cells known as zooxanthellae is a key feature of reef building corals. Incorporated into the coral tissue, these photosynthesizing zooxanthellae provide much of the polyp's nutritional needs, primarily in the form of carbohydrates. Most corals supplement this food source by actively feeding on zooplankton or dissolved organic nitrogen, due to the low nitrogen content of the carbohydrates derived from photosynthesis. The structure and function of all coral reef ecosystems are controlled by the prevailing oceanographic conditions (Maragos and Gulko, 2002).

As coral health and growth rates are dependant on water temperature, the highly variable water temperature of NWHI 18°-28° C (64°-82° F) can affect the coral reef ecosystem. The NWHI are unique in that they contain the northernmost coral reef ecosystem (Kure Atoll) on the planet. The water temperatures experienced there are assumed to be the lower limit for corals to thrive and reefs to grow. Kure Atoll may lie near the "Darwin Point" for reef development, a geographical limit beyond which corals and coralline algae can no longer deposit enough calcium carbonate to keep up with the subsidence of the area's volcanic base. Reefs at latitudes higher than the Darwin Point fail to remain at sea level and sink below the photic zone within which growth can occur (Maragos and Gulko 2002).

The distribution of organisms found with coral reef ecosystems (e.g. corals, seagrasses, algae, sponges, and associated animals) are generally influenced by nutrient availability, salinity, light, substrate, wave forces, sediment and temperature (Maragos and Gulko 2002). A coral reef ecosystem generally occurs in water less than 30 m deep, but some coral and algal species that do not depend light to grow can be found in waters of 300 m or more (Grigg and Epp, 1989); Maragos and Jokiel, 1986)

The coral reef ecosystems of the NWHI were once thought to represent nearly 70 percent of the total coral reef area (0-100 fm) under U.S. jurisdiction (Hunter 1995). Recent research, however, estimates that the NWHI represents nearly 5 percent of the total U.S. coral reef area from 0-100 fm (Rohmmann et al., 2005). This large discrepancy is due to Florida's potential coral reef habitat being significantly underestimated in the mid-1990's. It is now thought that the potential coral reef habitat off of Florida composes nearly 80 percent of coral reef habitat in the U.S. (Rohmmann et al., 2005).

The coral reef ecosystems of the NWHI has been found to be pristine condition (Maragos and Gulko, 2002). As opposed to coral reef ecosystems in other regions, the coral reef ecosystem of the NWHI generally has low biodiversity and high endemism. This is due the Hawaii Archipelago's isolation in the Pacific compounded by a general east to west surface current flow and lack of close coral reef ecosystems "upstream" of the Hawaiian Islands (Maragos and Gulko, 2002).

Management Unit Species

Tables 5 and 6 present the MUS contained within the Coral Reef Ecosystems FMP. Because the NWHI portions of FMP were unapproved, there is currently no management system in place in the NWHI for coral reef associated species.

Table 5: Currently Harvested Coral Reef Taxa (CHCRT)

Currently Harvested Coral Reef Taxa	
Acanthuridae (Surgeonfishes)	Orange-spot surgeonfish (*Acanthurus olivaceus*) Yellowfin surgeonfish (*Acanthurus xanthopterus*) Convict tang (*Acanthurus triostegus*) Eye-striped surgeonfish (*Acanthurus dussumieri*) Blue-lined surgeon (*Acanthurus nigroris*) Whitebar surgeonfish (*Acanthurus leucopareius*) Blue-banded surgeonfish (*Acanthurus lineatus*) Blackstreak surgeonfish (*Acanthurus nigricauda*) Whitecheek surgeonfish (*Acanthurus nigricans*) White-spotted surgeonfish (*Acanthurus guttatus*) Ringtail surgeonfish (*Acanthurus blochii*) Brown surgeonfish (*Acanthurus nigrofuscus*) Elongate surgeonfish (*Acanthurus mata*) Mimic surgeonfish (*Acanthurus pyroferus)* Yellow-eyed surgeonfish (*Ctenochaetus strigousus*) Striped bristletooth (*Ctenochaetus striatus*) Twospot bristletooth (*Ctenochaetus binotatus*) Bluespine unicornfish (*Naso unicornus*) Orangespine unicornfish (*Naso lituratus*) Humpnose unicornfish (*Naso tuberosus*) Black tongue unicornfish (*Naso hexacanthus*) Bignose unicornfish (*Naso vlamingii*) Whitemargin unicornfish (*Naso annulatus*) Spotted unicornfish (*Naso brevirostris*) Humpback unicornfish (*Naso brachycentron*) Barred unincornfish (*Naso thynnoides*) Gray unicornfish (*Naso caesius*)
Balistidae (Triggerfishes)	Titan triggerfish (*Balistoides viridescens*) Clown triggerfish *(B. conspicillum*) Orangstriped trigger*fish* (*Balistapus undulatus*) Pinktail triggerfish (*Melichthys vidua*) Black triggerfish (*M. niger)* Blue Triggerfish (*Pseudobalistesfucus*) Picassofish (*Rhinecanthus aculeatus*) Wedged Picassofish (*B. rectangulus*) Bridled triggerfish (*Sufflamen fraenatus*)
Carangidae (Jacks)	Bigeye scad (*Selar crumenophthalmus*) Mackerel scad (*Decapterus macarellus*)

Currently Harvested Coral Reef Taxa	
Carcharhinidae (Sharks)	*Grey reef shark (Carcharhinus amblyrhynchos*) Silvertip shark (Carcharhinus albimarginatus) Galapagos shark (*Carcharhinus galapagenis*) Blacktip reef shark (*Carcharhinus melanopterus*) Whitetip reef shark (*Triaenodon obesus*)
Holocentridae (Soldierfish/Squirrelfish)	Bigscale soldierfish (*Myripristis berndti*) Bronze soldierfish (*Myripristis adusta*) Blotcheye soldierfish (*Myripristis murdjan*) Bricksoldierfish (*Myripristis amaena*) Scarlet soldierfish (*Myripristis pralinia*) Violet soldierfish (*Myripristis violacea*) Whitetip soldierfish (*Myripristis vittata*) Yellowfin soldierfish (*Myripristis chryseres*) Pearly soldierfish (*Myripristis kuntee*) (*Myripristis hexagona*) Tailspot squirrelfish (*Sargocentron caudimaculatum*) Blackspot squirrelfish (*Sargocentron melanospilos*) File-lined squirrelfish (*Sargocentron microstoma*) Pink squirrelfish (*Sargocentron tieroides*) Crown squirrelfish (*Sargocentron diadema*) Peppered squirrelfish (*Sargocentron punctatissimum*) Blue-lined squirrelfish (*Sargocentron tiere*) Ala‘ihi (*Sargocentron xantherythrum*) (*Sargocentron furcatum*) (*Sargocentron spiniferum*) Spotfin squirrelfish(*Neoniphon spp.*)
Kuhliidae (Flag-tails)	Hawaiian flag-tail (*Kuhlia sandvicensis*) Barred flag-tail (*Kuhlia mugil*)
Kyphosidae (Rudderfish)	Rudderfish (*Kyphosus biggibus*) (*Kyphosus cinerascens*) (*Kyphosus vaigienses*)

Currently Harvested Coral Reef Taxa	
Labridae (Wrasses)	Saddleback hogfish (*Bodianus bilunulatus*) Napoleon wrasse (*Cheilinus undulatus*) Triple-tail wrasse (*Cheilinus trilobatus*) Floral wrasse (*Cheilinus chlorourus*) Harlequin tuskfish (*Cheilinus fasciatus*) Ring-tailed wrasse (*Oxycheilinus unifasciatus*) Bandcheek wrasse (*Oxycheilinus diagrammus*) Arenatus wrasse (*Oxycheilinus arenatus*) Razor wrasse (*Xyricthys pavo*) Whitepatch wrasse (*Xyrichtes aneitensis*) Cigar wrass (*Cheilio inermis*) Blackeye thicklip (*Hemigymnus melapterus*) Barred thicklip (*Hemigymnus fasciatus*) Threespot wrasse (*Halichoeres trimaculatus*) Checkerboard wrasse (*Halichoeres hortulanus*) Weedy surge wrasse (*Halichoeres margaritacous*) (*Halichoeres zeylonicus*) Surge wrasse (*Thalassoma purpureum*) Redribbon wrasse (*Thalassoma quinquevittatum*) Sunset wrasse (*Thalassoma lutescens*) Longface wrasse (*Hologynmosus doliatus*) Rockmover wrasse (*Novaculichthys taeniourus*)
Mullidae (Goatfishes)	Yellow goatfish (*Mulloidichthys spp.*) (*Mulloidichthys Pfleugeri*) (*Mulloidichthys vanicolensis*) (*Mulloidichthys flaviolineatus*) Banded goatfish (*Parupeneus spp*.) (*Parupeneus barberinus*) (*Parupeneus bifasciatus*) (*Parupeneus heptacanthus*) (*Parupeneus ciliatus*) (*Parupeneus ciliatus*) (*Parupeneus cyclostomas*) (*Parupeneus pleurostigma*) (*Parupeneus indicus*) (*Parupeneus multifaciatus*) Bantail goatfish (*Upeneus arge)*
Mugilidae (Mullets)	Stripped mullet (*Mulgil cephalus)* Engel's mullet (*Moolgarda engeli*) False mullet (*Neomyxus leuciscus*) Fringelip mullet (*Crenimugil crenilabis*)

Currently Harvested Coral Reef Taxa	
Muraenidae (Moray eels)	Yellowmargin moray (*Gymnothorax flavimarginatus*) Giant moray (*Gymnothorax javanicus*) Undulated moray (*Gymnothorax undulatus*)
Ocotpodidae	Octopus (*Octupus cyanea; O. ornatus*)
Polynemidae	Threadfin (*Polydactylus sexfilis*) -Moi
Pricanthidae (Bigeye)	Glasseye (*Heteropriacanthus cruentatus*) Bigeye (*Priacanthus hamrur*)
Scaridae (Parrotfishes)	Humphead parrotfish (*Bulbometapon muracatum*) Parrotfishes (*Scarus spp.*) Pacific longnose parrotfish (*Hipposcarus longiceps*) Stareye parrotfish (*Catolomus carolinus*)
Scombirdae	Dogtooth tuna (*Gymnosarda unicolor*)
Siganidae (Rabbitfish)	Forktail rabbitfish (*Siganus aregentus*) Golden rabbitfish (*Siganus guttatus*) Gold-spot rabbitfish (*Siganus punctatissimus*) Randall's rabbitfish (*Siganus randalli*) Scribbled rabbitfish (*Siganus spinus*) Vermiculate rabbitfish (*Signaus vermiculatus*)
Sphyraenidae (Barracuda)	Heller's barracuda (*Sphyraena helleri*) Great Barracuda (*Sphyraena barracuda)*
Turbinidae (turban shells/green snails)	Green snails (*Turbo spp.*)

Currently Harvested Coral Reef Taxa	
Aquarium Taxa/Species	Acanthuridae Yellow tang (*Zebrasoma flavescens*) Yellow-eyed surgeon fish (*Ctenochaetus strigosus*) Achilles tang (*Acanthurus achilles*) Muraenidae Dragon eel (*Enchelycore pardalis*) Zanclidae Morrish idol (*Zanclus cornutus*) Pomacanthidae Angelfish (*Centropyge shepardi* and *C. flavissimus*) Cirrhitidae Flame hawkfish (*Neocirrhitus armatus*) Chaetodontidae Butterflyfish (*Chaetodon auriga, C. lunula, C. melannotus* and *C. ephippium*) Pomacentridae amselfish (*Chromis viridis, Dascyllus aruanus* and *D. trimaculatus*) Sabellidae Featherduster worm (*Sabellidae*)

Table 6: Potentially Harvested Coral Reef Taxa (PHCRT)

(Note: Several taxa in the CHCRT list appear below. As noted in the table, all species in these taxa that are not listed as CHCRT or other FMP MUS are by default PHCRT).

Potentially Harvested Coral Reef Taxa	
Other Labridae spp. (wrasses) (Those species not listed on CHCRT list)	*Ephippidae (batfish)*
Other Carcharhinidae, Sphyrnidae (Those species not listed on CHCRT list)	*Monodactylidae (mono)*
Dasyatididae, Myliobatidae, Mobulidae (rays)	*Haemulidae (sweetlips)*
Other Serranidae spp. (groupers)	*Echineididae (remoras)*
Carangidae (jacks/trevallies)	*Malacanthidae (tilefish)*
	Acanthoclinidae (spiny basslets)
Other Holocentridae spp. (soldierfish/squirrelfish) (Those species not listed on CHCRT list)	*Pseudochromidae (dottybacks)*
Other Mullidae spp. (goatfish) (Those species not listed on CHCRT list)	*Plesiopidae (prettyfins)*

Potentially Harvested Coral Reef Taxa	
Other Acanthuridae spp. (surgeonfish/unicornfish) (Those species not listed on CHCRT list)	*Tetrarogidae (waspfish)*
Other Lethrinidae spp. (emperors)	*Caracanthidae (coral crouchers)*
Chlopsidae, Congridae, Moringuidae, Ophichthidae (eels) Other Muraenidae (morays eels) (Those species not listed on CHCRT list)	*Grammistidae (soapfish)*
Apogonidae (cardinalfish)	*Aulostomus chinensis* (trumpetfish)
Other Zanclidae spp. (moorish idols)	*Fistularia commersoni* (coronetfish)
Other Chaetodontidae spp. (butterflyfish)	*Anomalopidae (flashlightfish)*
Other Pomacanthidae spp. (angelfish)	*Clupeidae (herrings)*
Other Pomacentridae spp. (damselfish)	*Engraulidae (anchovies)*
Scorpaenidae (scorpionfish)	*Gobiidae (gobies)*
Blenniidae (blennies)	*Lutjanidae*
Other Sphyraenidae spp. (barracudas)	*Other Ballistidae/Monocanthidae spp. (Those species not listed on CHCRT list)*
Pinguipedidae (sandperches)	*Other Siganidae spp. (Those species not listed on CHCRT list)*
Gymnosarda unicolor	*Other Kyphosidae spp.*
Bothidae/Soleidae/Pleurnectidae (flounder/sole)	*Caesionidae*
Ostraciidae (trunkfish)	*Cirrhitidae*
Tetradontidae/Diodontidae (puffer/porcupinefish)	*Antennariidae (frogfishes)*
	Syngnathidae (pipefishes/seahorses)
Stony corals	*Echinoderms (e.g., sea cucumbers, sea urchins)*
Heliopora (blue)	*Mollusca*
Tubipora (organpipe)	*Sea Snails (gastropods)*
Azooxanthellates (non-reefbuilders)	*Trochus spp.*

Potentially Harvested Coral Reef Taxa	
Fungiidae (mushroom corals)	*Opistobranchs (sea slugs)*
Sm/Lg Polyped Corals (endemic spp.)	*Pinctada margaritifera (black lipped pearl oyster)*
Millepora (firecorals)	*Tridacnidae*
Sot corals and Gorgonians	*Other Bivalves*
Anemones (non-epifaunal)	*Cephalopods*
Zooanthids	*Crustaceans (Lobsters, Shrimps/Mantis, True Crabs and hermit crabs) (Those species not managed under the Crustacean FMP)*
Sponges (non-epifaunal)	*Stylasteridae (lace corals)*
Hydrozoans	*Solanderidae (hydroid fans)*
Bryozoans	*Annelids*
	Algae
Tunicates (solitary/colonial)	*Live rock*
All other coral reef ecosystem associated marine plants, invertebrates and fishes not listed under existing FMPs.	

NWHI Coral Reef Communities: The structure of reef communities is usually defined in terms of the diversity and relative abundances of species characteristic of a habitat type. Commonly, only a few species compose over half the abundance, while hundreds of others are present in low numbers. Coral species richness tends to be higher in the NWHI, where the genus *Acropora*, not found in the MHI, is present. A peak in coral species diversity occurs in the middle of the Hawaiian Archipelago at FFS and Maro Reef (Grigg 1983). Many reefs in the NWHI are comprised of calcareous algae (Green 1997). In general, fish species diversity appears to be lower in the NWHI than in the MHI. Although the inshore fish assemblages of the two regions are similar, fish size, density and biomass are significantly higher in the NWHI. Fish communities in the NWHI are dominated by apex predators (sharks and jacks), whereas those in the MHI are not (Friedlander and DeMartini 2002). Some fish species are common in parts of the NWHI that are rare elsewhere in the archipelago (Green 1997).

Life History of Coral Reef Fish

The literature on coral reef fish life histories is voluminous, but convenient entries into the literature are provided by Sale (1991), Polunin and Roberts (1996), and Birkeland (1997a). The life of a coral reef fish includes several stages. Typically, spawning occurs in the vicinity of the reef and is characterized by frequent repetition throughout a protracted time of the year, a diverse array of behavioral patterns, and extremely high fecundity. The eggs of many species are fertilized externally and dispersed directly into the pelagic environment as plankton. Other species have demersal eggs, which upon hatching disperse larvae into the pelagic realm. Planktonic mortality is very high and unpredictable. Recruitment is the transition stage from the planktonic larval life to demersal existence on a coral reef. Recruitment is both spatially and temporally highly variable. This is when post-larval juveniles begin their residence on reefs where many remain for life. Highest predation mortality occurs in the first few days or weeks, thus rapid growth out of the juvenile stage is a common strategy.

Terrestrial animal populations are usually dispersed by adults, who deposit eggs or build nests in selected locations. In contrast, the most frequent pattern for coral reef organisms is dispersion of eggs and larvae in water currents, which determine the final location of adults. The adults are often sedentary or territorial. The differences in factors that bring about success in these two life history phases complicate fisheries management (Birkeland 1997b).

Reproduction and Recruitment: The majority of coral reef animals are very fecund, but temporal variations in recruitment success have been recorded for some species and locations. Many of the large, commercially-targeted coral reef animals are long-lived and reproduce for a number of years. This is in contrast to the majority of commercially-targeted species in the tropical pelagic ecosystem. Long-lived species adapted to coral reef systems are often characterized by complex reproductive patterns like sequential hermaphroditism, sexual maturity delayed by social hierarchy, multi-species mass spawnings, and spawning aggregations in predictable locations (Birkeland 1997b).

Growth and Mortality Rates: Recruitment of coral reef species is limited by high mortality of eggs and larvae, and also by competition for space to settle out on coral reefs. Predation intensity is due to a disproportionate number of predators, which limits juvenile survival (Birkeland 1997b). In response some fishes—such as scarids (parrotfish) and labrids (wrasses)—grow rapidly compared with most coral reef fishes. But they still grow relatively slowly compared to pelagic species. In addition, scarids and labrids may have complex haremic territorial social structures that contribute to the overall effect of harvesting these resources. It appears that many tropical reef fishes grow rapidly to near-adult size, and then often grow relatively little over a protracted adult life span; they are thus relatively long-lived. In some groups of fishes, such as damselfish, individuals of the species are capable of rapid growth to adult size, but sexual maturity is still delayed by social pressure. This complex relationship between size and maturity makes resource management more difficult (Birkeland 1997b).

Population Dynamics: Studies on coral reef fisheries are relatively recent, commencing with the major study by Munro and his co-workers during the late 1960s in the Caribbean (Munro 1983). Even today, only a relatively few examples are available of in-depth studies on reef fisheries. It was initially thought that the maximum sustainable yields for coral reef fisheries were in the range of 0.5-5 $t/km^{-2}yr^{-1}$, based on limited data (Marten and Polovina 1982; Stevenson and Marshall 1974). Much higher yields of around 20 $t/km^{-2}yr^{-1}$, for reefs in the Philippines (Alcala 1981; Alcala and Luchavez 1981) and American Samoa (Wass 1982), were thought to be unrepresentative (Marshall 1980), but high yields of this order have now been independently estimated for a number of sites in the South Pacific and Southeast Asia (Dalzell and Adams 1997; Dalzell et al. 1996). These higher estimates are closer to the maximum levels of fish production predicted by trophic and other models of ecosystems (Polunin and Roberts 1996). Dalzell and Adams (1997) suggest that the average MSY for Pacific reefs is in the region of 16 $t/km^{-2}yr^{-1}$ based on 43 yield estimates where the proxy for fishing effort was population density.

However, Birkeland (1997a) has expressed some scepticism about the sustainability of the high yields reported for Pacific and south east Asian reefs. Among other examples, he notes that the high values for American Samoa reported by Wass (1982) during the early 1970's were followed by a 70 percent drop in coral reef fishery catch rates between 1979 and 1994. Saucerman (1995) ascribed much of this decline to a series of catastrophic events over the same period. This began with a crown of thorns infestation in 1978, followed by hurricanes in 1990 and 1991, which reduced the reefs to rubble, and a coral bleaching event in 1994, probably associated with the El Niño phenomenon. These various factors reduced live coral cover in American Samoa from a mean of 60 percent in 1979, to between 3-13 percent in 1993.

Further, problems still remain in rigorously quantifying the effects of factors on yield estimates, such as primary productivity, depth, sampling area, or coral cover. Polunin et al. (1996) noted that there was an inverse correlation between estimated reef fishery yield and the size of the reef area surveyed, based on a number of studies reported by Dalzell (1996). Arias-Gonzales et al. (1994) have also examined this feature of reef fisheries yield estimates and noted that this was a problem when comparing reef fishery yields. The study noted that estimated yields are based on the investigator's perception of the maximum depth at which true reef fishes occur. Small pelagic fishes, such as scads and fusiliers, may make up large fractions of the inshore catch from a particular reef and lagoon system, and if included in the total catch can greatly inflate the yield estimate. The great variation in reef yield summarized by authors such as Arias-Gonzales et al. (1994), Dalzell (1996) and Dalzell and Adams (1997) may also be due in part to the different size and trophic levels included in catches.

Another important aspect of the yield question is the resilience of reefs to fishing and recovery potential when overfishing or high levels of fishing effort have been conducted on coral reefs. Evidence from a Pacific atoll where reefs are regularly fished by community fishing methods, such as leaf sweeps and spearfishing, indicated that depleted biomass levels may recover to pre-exploitation levels within one to two years. In the Philippines, abundances of several reef fishes have increased in small reserves within a few years of their establishment (Russ and Alcala 1994), although recovery in numbers of fish is much faster than recovery of biomass, especially in larger species such as groupers. Other studies in the Caribbean and South East Asia (Polunin et al. 1996) indicate that reef fish populations in relatively small areas have the potential to recover rapidly from depletion in the absence of further fishing. Conversely, Birkeland (1997a) cites the example of a pinnacle reef off Guam fished down over a period of six months in 1967, that has still not recovered thirty years later.

Estimating the recovery from, and reversibility of, fishing effects over large reef areas appears more difficult to determine. Where growth overfishing predominates, recovery following effort reduction may be rapid if the fish in question are fast growing, as in the case of goatfish (Garcia and Demetropolous 1986). However, recovery may be slower if biomass reduction was due to recruitment overfishing because it takes time to rebuild adult spawning biomasses and high fecundities (Polunin and Morton 1992). Further, many coral reef species have limited distributions; they may be confined to a single island or a cluster of proximate islands.

Individual sub-populations of larger stocks of reef species may increase, decrease, or cease to exist locally without adversely affecting the overall population. The condition of the overall populations of particular species is linked to the variability among sub-populations: the ratio of sources and sinks; their degrees of recruitment connection; and, the proportion of the sub-populations with high variability in reproductive capacity. Recruitment to populations of coral reef organisms depends largely on the pathways of larval dispersal and “downstream” links.

Perhaps the most important factor in the population dynamics of many coral reef species in the NWHI and the ecosystem as a whole are cyclical oceanographic events which affect productivity over large areas and may account for large fluctuations in population abundance. In a study of climatic and oceanographic events and their effect on productivity in the NWHI, Polovina et al. (1994) found declines of 30 to 50 percent in a wide variety of species from various trophic levels, from the early 1980s to the present, could be explained by a shift in oceanographic conditions. Prior to this time period, oceanographic conditions that lasted from the late 1970s until the early 1980s moved nutrient-rich deep ocean water into the euphotic zone, resulting in higher densities of reef fish, crustaceans, Hawaiian monk seals and seabirds.

Habitat and Distribution of Coral Reef Fish

Species diversity declines eastwards across the Pacific from the locus of maximum species richness in Southeast Asia (especially in the Philippines and Indonesia), and is related in part to the position of land masses in relation to the Pacific Plate, the earth’s largest lithospheric plate (Springer 1982). In general, species richness is greatest along the plate margin and declines markedly on the plate itself. As a result, islands in the Central Pacific generally have a lower reef organism diversity, but also a high degree of endemism. For example, Guam has about 269 species of zooxanthellate Scleractinian corals, about 40 Alcyonacea and just under a thousand species of fishes; Hawaii has far fewer in comparison. The proportion of endemic species increases in the opposite direction. For example, the Hawaiian Islands have about 18 percent endemic zooxanthellate corals, 60 percent endemic Alcyonacea and 25 percent endemic reef fishes, compared to the islands in the southwest part of the Western Pacific Region. The proportion of alien species in Hawaiian waters is also greater, and it is increasing (Birkeland 1997a).

As noted above, among the diverse array of species in each taxa on coral reefs, there are usually only a few that are consistently abundant, with the relative abundance of species within a taxa possibly approximating a log-normal distribution. The majority of species are relatively uncommon or only episodically abundant, following unusually successful recruitment (Birkeland 1997b).

Community Variability: High temporal and spatial variability is characteristic of reef communities. At large spatial scales, variation in species assemblages may be due to major differences in habitat types or biotopes. For example, sea grass beds, reef flats, lagoonal patch reefs, reef crests, and seaward reef slopes may occur in relatively close proximity, for example, but represent notably different habitats.

Reef fish communities from the geographically isolated Hawaiian Islands are characterized by low species richness, high endemism, and exposure to large semiannual current gyres, which may help retain planktonic larvae. The NWHI is further characterized by: (1) high latitude coral atolls; (2) a mild temperate to subtropical climate, where inshore water temperatures can reach below 18° C in late winter; (3) species that are common on shallow reefs and attain large sizes, which to the southeast occur only rarely or in deep water; and, (4) inshore shallow reefs that are largely free of fishing pressure.

Coral Reef Habitat: Even within a thriving coral reef habitat, not all space is occupied by corals or coralline algae. Reefs are typically patchworks of hard and sediment bottoms. A reef provides a variety of environmental niches, or combination of resources. The wide variety of survival strategies employed by coral reef organisms allows different species to exploit some combination of resources better than their competitors. The ecosystem is dynamic, however. If conditions change, a very specialized species may not be able to survive the rigors of the new environment or may be forced out by another species more adept at using the available resources, including space, food, light, water motion, and temperature.

Long-term Ecosystem Variability: Climate and ecosystem shifts may occur over decadal scale cycles or longer, meaning that resources management decisions need to consider changes in target level productivity over the long-term as well as short-term inter-annual variation. For example, the climatic shift that occurred in the central North Pacific in the late 1980s produced an ecosystem shift in the NWHI to a lower carrying capacity, with a 30-50 percent decline in productivity (Polovina et al. 1994). This in turn reduced recruitment and survival of monk seals, reef fish, albatross, and lobsters. Under the lower carrying capacity regime, excess fishing may alter the age-structure of the population and may also lead to stock depletion.

At Laysan Island, where lobster fishing is prohibited, the spawning biomass of lobsters was also depleted by natural mortality. This suggests that marine reserves may not guarantee the protection that is typically assumed (Polovina and Haight 1999). In response to this natural variability, the Council adjusted its management measures (e.g., limited entry, annual quota) to reduce catch and effort to about 25 percent of its 1980s level.

Coral bleaching occurs when corals lose or expel their zooxanthellae in large numbers, usually due to some trauma such as high or low temperatures or lower than usual salinities (Brown 1997). The corals that lose zooxanthellae also lose their color, becoming white and hence the term ‘bleaching.’ Although first described in the 1900s, interest in this phenomenon was heightened in the 1980s and 1990s after a series of major bleaching events in the Atlantic and Pacific Oceans. Some of these episodes were linked to the El-Niño Southern Oscillation or

ENSO events (Gulko 1998). In 2002, several areas of the NWHI (Kure, Midway, Pearl and Hermes) were found to have experienced some coral bleaching (Kenyon, 2004, pers. comm).

When bleaching occurs, some corals are able to regain zooxanthellae by slowly re-infecting themselves with the algae, or through the reproduction of remaining zooxanthellae within the colony. Frequently, the loss of large amounts of symbiotic algae results in the colony becoming energy deficient; it expends more energy than it is consuming. If this occurs over the long term the colony dies (Brown 1997). Coral bleaching events require only a 1-2° C increase in water temperature. Thus, due to global warming, bleaching may become more common. According to Goreau et al. (1997), similar events in the Atlantic and the Indian Oceans suggest that worldwide corals are acclimated close to their upper temperature limits. As a result, they are unable to adapt rapidly to an anomalous warming (Goreau et al. 1997). Consequently, global warming represents a very serious threat to the survival of coral reefs.

Other physical phenomena that may bring long-term change to coral reef systems include the impact of hurricanes and tectonic uplift. Bayliss-Smith (1988) describes the changes in reef islands at Ontong-Java Atoll over a 20-year period following a severe hurricane. Most atoll islands are on reef flats in what are frequently high wave-energy locations near to seaward reef margins. Unless composed of coarse shingle and rubble, these islands are unstable. Hurricanes will destroy such small cays and scour *motu* beaches, and strip small or narrow islands of fine sediment during over-wash periods. Bayliss Smith (1988) notes that while hurricanes tend to erode islands, they also produce the material for their reconstruction. More frequent, lower magnitude storms contribute to the process by transporting the rubble ramparts thrown up by hurricanes. This reconstructs scoured beaches and eroded shorelines. Clearly, such destruction and reconstruction activity on reef flats will have an effect on reef organisms, including fish and invertebrates, particularly where large areas of reef are smothered by sand and silt following a hurricane.

Status of the Stocks

NWHI coral reef associated fish stocks are believed to be in healthy condition as compared to the MHI. For example, the overall standing stock of the Spectacled Parrotfish (*Chlorurus perspicillatus*) is 1160 percent greater in NWHI than in the MHI (Maragos and Gulko 2002). Average fish biomass is three times higher in the NWHI than in the MHI. This is because 54 percent of biomass is comprised of top-level predators, whereas top-level predators in the MHI comprise only 3 percent of the fish biomass (Friedlander and DeMartini 2002). While the abundance of herbivores in the NWHI is similar to MHI coral reefs, the size and weight of these fish are higher in the NWHI than in the MHI (Maragos and Gulko 2002). Studies conducted at French Frigate Shoals and Midway found that reef fishes declined by about one-third from the early eighties to early nineties. Such declines are thought to be associated with interdecadel regime shifts in productivity (Demartini et al. 2002). As with many marine organisms, relative abundance of reef fish species are linked to fluctuations in environmental conditions that result in changes to productivity levels, larval transport, and recruitment.

2.2.5 Pelagic Stocks

Fishing for pelagic species within the proposed NWHI sancutary is done primarily by bottomfish permit holders trolling to and from bottomfish grounds, in addition to small-scale handline fisheries towards the southern end of the NWHI. Regulations promulgated under the Pelagics FMP prohibit Hawaii-based longline vessels from fishing within 50 nm of the NWHI. The extent of recreational or subsistence pelagic fishing is unknown, but is thought to be low. Table 7 lists the MUS contained in the Pelagics FMP.

Table 7: Pelagic Management Unit Species

Temperate species complex:	Striped Marlin (*Tetrapturus audax*)
	Bluefin Tuna (*Thunnus thynnus)*
	Swordfish (*Xiphias gladius*)
	Albacore tuna (*Thunnus alalunga*)
	Mackerel (*Scomber* spp)
	Bigeye tuna (*Thunnus obesus*)
	Pomfret (family Bramidae)
Tropical species complex:	Yellowfin tuna (*Thunnus albacares*)
	Kawakawa (*Euthynnus affinis*)
	Skipjack tuna (*Katsuwonus pelamis*)
	Frigate and bullet tunas (*Auxis thazard, A. rochei*)
	Blue marlin (*Makaira mazara*)
	Slender tunas (*Allothunnus fallai)*
	Black marlin (*Makaira indica*)
	Dogtooth tuna (*Gymnosarda unicolor*)
	Spearfish (*Tetrapturus* spp.)
	Sailfish (*Istiophorus platypterus*)
	Mahimahi (*Coryphaena hippurus, C. equiselas*)
	Wahoo (*Acanthocybium solandri*)
	Opah (*Lampris guttatus*)
	Snake mackerels or oilfish (family Gempylidae)
	Crocodile sharks (*Pseudocarcharias kamoharai)*
	Requiem sharks (family Carcharhinidae)
	Mackerel sharks (family Lamnidae)
	Hammerhead sharks (family Sphyrnidae)

Life History

Pelagic species are closely associated with their physical and chemical environment. Suitable physical environment for these species depends on gradients in temperature, oxygen or salinity, all of which are influenced by oceanic conditions on various scales. In the pelagic environment, physical conditions such as isotherm and isohaline boundaries often determine whether or not the surrounding water mass is suitable for pelagic fish, and many of the species are associated with specific isothermic regions. Additionally, areas of high trophic transfer as found in fronts and eddies are an important habitat for foraging, migration, and reproduction for many species (Bakun, 1996).

Oceanic pelagic fish such as skipjack and yellowfin tuna, and blue marlin prefer warm surface layers, where the water is well mixed by surface winds and is relatively uniform in temperature and salinity. Other fish such as albacore, bigeye tuna, striped marlin and swordfish, prefer cooler, more temperate waters, often meaning higher latitudes or greater depths. Preferred water temperature often varies with the size and maturity of pelagic fish, and adults usually have a wider temperature tolerance than sub-adults. Thus, during spawning, adults of many pelagic species usually move to warmer waters, the preferred habitat of their larval and juvenile stages. Large-scale oceanographic events (such as *El Niño*) change the characteristics of water temperature and productivity across the Pacific, and these events have a significant effect on the habitat range and movements of pelagic species. Tunas are commonly most concentrated near islands and seamounts that create divergences and convergences which concentrate forage species, also near upwelling zones along ocean current boundaries, and along gradients in temperature, oxygen and salinity. Swordfish and numerous other pelagic species tend to concentrate along food-rich temperature fronts between cold, upwelled water and warmer oceanic water masses.

These fronts represent sharp boundaries in a variety of physical parameters including temperature, salinity, chlorophyll, and sea surface height (geostrophic flow) (Niiler and Reynolds, 1984; Roden, 1980; Seki et al., in press). Biologically, these convergent fronts appear to represent zones of enhanced trophic transfer (Bakun, 1996; Olson et al., 1994). The dense cooler phytoplankton-rich water sinks below the warmer water creating a convergence of phytoplankton (Roden, 1980). Buoyant organisms, such as jellyfish as well as vertically swimming zooplankton, can maintain their vertical position in the weak down-welling, and aggregate in the front to graze on the down-welled phytoplankton (Bakun, 1996). The increased level of biological productivity in these zones attracts higher trophic-level predators such as swordfish, tunas, seabirds, and sea turtles, and ultimately a complete pelagic food web is assembled.

Habitat and Distribution

Near Hawaii, there are two prominent frontal zones. These frontal zones are associated with two isotherm (17° C and 20° C), and they are climatologically located at latitudes 32°-34° N. (the Subtropical Front or STF) and latitudes 28°-30° N. (the South Subtropical Front or SSTF) (Seki et al., 2002). Both the STF and SSTF represent important habitats for swordfish, tunas, seabirds and sea turtles. Variations in their position play a key role in catch rates of swordfish and albacore tuna, and distribution patterns of Pacific pomfret, flying squid, loggerhead turtles (Seki et al., in press), and seabirds. Hawaii-based longline vessels targeting swordfish set their lines where the fish are believed to be moving south through the fronts following squid, the primary prey of swordfish (Seki et al.,). Squid is also the primary prey item for albatross (Harrison et al., 1983), hence the albatross and longline vessels targeting swordfish are often present at the same time in the same area of biological productivity.

These frontal zones have also been found to be likely migratory pathways across the Pacific for loggerhead turtles (Polovina et al., 2000). Loggerhead turtles are opportunistic omnivores that feed on floating prey such as the pelagic cnidarian *Velella velella* ("by the wind sailor"), and the pelagic gastropod *Janthina sp.*, both of which are likely to be concentrated by the weak downwelling associated with frontal zones (Polovina et al., 2000). Data from on-board observers in the Hawaii-based longline fishery indicate that incidental catch of loggerheads occurs along the 17° C front (STF) during the first quarter of the year and along the 20° C front (SSTF) in the second quarter of the year. The interaction rate, however, is substantially greater along the 17° C front (Polovina et al., 2000).

Species of oceanic pelagic fish live in tropical and temperate waters throughout the world's oceans. They are capable of long migrations that reflect complex relationships to oceanic environmental conditions. These relationships are different for larval, juvenile and adult stages of life. The larvae and juveniles of most species are more abundant in tropical waters, whereas the adults are more widely distributed. Geographic distribution varies with seasonal changes in ocean temperature. In both the Northern and Southern Hemispheres, there is seasonal movement of tunas and related species toward the pole in the warmer seasons and a return toward the equator in the colder seasons. In the western Pacific, pelagic adult fish range from as far north as Japan to as far south as New Zealand. Albacore, striped marlin and swordfish can be found in even cooler waters at latitudes as far north as latitude 50° N. and as far south as latitude 50° S. As a result, fishing for these species is conducted year-round in tropical waters and seasonally in temperate waters.

Migration patterns of pelagic fish stocks in the Pacific Ocean are not easily understood or categorized, despite extensive tag-and-release projects for many of the species. This is particularly evident for the more tropical tuna species (e.g., yellowfin, skipjack, bigeye) which appear to roam extensively within a broad expanse of the Pacific centered on the equator. Although tagging and genetic studies have shown that some interchange does occur, it appears that short life spans and rapid growth rates restrict large-scale interchange and genetic mixing of eastern, central and far-western Pacific stocks of yellowfin and skipjack tuna. Morphometric studies of yellowfin tuna also support the hypothesis that populations from the eastern and western Pacific derive from relatively distinct sub-stocks in the Pacific. The stock structure of bigeye in the Pacific is poorly understood, but a single, Pacific-wide population is assumed. The movement of the cooler-water tuna (e.g., bluefin, albacore) is more predictable and defined, with tagging studies documenting regular and well-defined seasonal movement patterns relating to specific feeding and spawning grounds. The oceanic migrations of billfish are poorly understood, but the results of limited tagging work conclude that most billfish species are capable of transoceanic movement, and some seasonal regularity has been noted.

In the ocean, light and temperature diminish rapidly with increasing depth, especially in the region of the thermocline. Many pelagic fish make vertical migrations through the water column. They tend to inhabit surface waters at night and deeper waters during the day, but several species make extensive vertical migrations between surface and deeper waters throughout the day. Certain species, such as swordfish and bigeye tuna, are more vulnerable to fishing when they are concentrated near the surface at night. Bigeye tuna may visit the surface during the night, but generally, longline catches of this fish are highest when hooks are set in deeper, cooler waters just above the thermocline (275-550 meters or 150-300 fathoms). Surface concentrations of juvenile albacore are largely concentrated where the warm mixed layer of the ocean is shallow (above 90 m or 50 fm), but adults are caught mostly in deeper water (90-275 m or 50-150 fm). Swordfish are usually caught near the ocean surface, but are known to venture into deeper waters. Swordfish demonstrate an affinity for thermal oceanic frontal systems which may act to aggregate their prey (Seki et al., 2002) and enhance migration by providing an energetic gain by moving the fish along with favorable currents (Olson et al., 1994).

Status of the Stocks

Pacific-wide stock assessments are conducted annually for the major commercial tuna species (bigeye, yellowfin, skipjack and albacore). Bigeye is experiencing high levels of fishing mortality (e.g. longline, purse seine fisheries) from overfishing, however the population has yet to be determined as overfished. The future stock depends on the future fishing mortality and future recruitment (SCTB 2004). Yellowfin stocks are also experiencing overfishing. The yellowfin stock assessment estimates that the tropical stocks (Indonesia) are being fully exploited, whereas the temperate region (Hawaii) stocks are likely being lightly exploited (SCTB 2004).

The Council was notified by letter on December, 15, 2004, that the Secretary of Commerce had determined that overfishing of bigeye tuna was occurring Pacific-wide. As indicated in the MSA, the Council was requested by the Secretary to take remedial action (i.e. recommend to NMFS an amendment to its Pelagics Fishery Management Plan) within one year of the identification by the Secretary. More recently in August 2005, the Science Committee of the Western and Central Pacific Fishery Commission reviewed a stock assessment that indicated that yellowfin tuna in the Western and Central Pacific also appears to being subjected to overfishing. A letter notifying the Council of this determination was received on March 16, 2006. Yellowfin tuna are now included in the Council's Draft Amendment 14 to the Pelagics FMP which recommends certain actions to address overfishing of both bigeye and yellowfin tunas. In particular it recommends a range of non-regulatory measures for the domestic and international management of these stocks, in addition to those measures being promulgated by regional fishery management organizations for longline and purse seine vessels. Regarding Hawaii-based non-longline pelagic fishing vessels, it recommends that all commercial vessel operators be required to obtain federal permits and submit federal logbooks of their catch and effort. It also recommends that targeted surveys be conducted of recreational fishermen to collect data on their catch and effort. Amendment 14 is now being processed by NMFS.

Although skipjack stocks experience high levels of fishing mortality, the stocks appear to be in healthy condition due higher levels of recruitment. Currently, there is not a stock assessment of the North Pacific albacore stock, however it is believed to healthy. South Pacific albacore stocks are believed to be healthy and at 60 percent of unfished levels (SCTB 2004).

Stock assessments of other important pelagic fish such as mahi mahi and ono are not available. Both of these populations, however, are thought to be in healthy condition. Most studies suggest that Pacific billfish stocks are healthy but there is considerable uncertainty because of the quality of data and differences in the methods used to evaluate the trends. Blue marlin stocks, however, may currently be fully exploited and facing high fishing mortality from various fisheries in the Central and Western Pacific.

2.2.6 Essential Fish Habitat

For each FMP and list of MUS, the Council has declared Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC). The Council and NMFS must ensure that any activities conducting in such areas do not adversely affect, to the extent possible, EFH of HAPC for any MUS. Table 8 represents the EFH and HAPC for all Western Pacific MUS.

Table 8: EFH and HAPC for all Western Pacific MUS

FMP	EFH (Juveniles and Adults)	EFH (Eggs and Larvae)	HAPC
Pelagics	Water column down to 1,000 m	Water column down to 200 m	Water column above seamounts and banks down to 1,000 m
Bottomfish and Seamount Groundfish	Bottomfish: Water column and bottom habitat out to a depth of 400 m Seamount Groundfish: (adults only) water column and bottom from 80 to 600 m, bounded by 29°-35°N and 171°E-179°W	Bottomfish: Water column to a depth of 400 m Seamount Groundfish: (including juveniles) epipelagic zone (0-200m) bounded by 29°-35°N and 171°E-179°W	Bottomfish: All escarpments and slopes between 40-280 m, and three known areas of juvenile *ōpakapaka* habitat Seamount Groundfish: not identified

FMP	EFH (Juveniles and Adults)	EFH (Eggs and Larvae)	HAPC
Precious Corals	Keāhole Point, Makapuu, Kaena Point, Westpac, Brooks Bank, 180 Fathom Bank deep water precious corals (gold and red) beds and Milolii, Auau Channel and S. Kauai black coral beds	Not applicable	Makapuu,Westpac, and Brooks Bank deep water precious corals beds and the Auau Channel black coral bed
Crustaceans	Bottom habitat from shoreline to a depth of 100 m	Water column down to 150 m	All banks within the NWHI with summits less than 30 m
Coral Reef Ecosystem	Water column and benthic substrate to a depth of 100 m	Water column and benthic substrate to a depth of 100 m	All MPAs identified in FMP, all PRIAs, many specific areas of coral reef habitat

Note: All areas are bounded by the shoreline and the outer boundary of the EEZ, unless otherwise indicated.

As the above table shows, Western Pacific EFH and HAPC fall into two categories: either the water column above the ocean bottom, or the ocean bottom itself. Water column EFH and HAPC have been designated for pelagic, bottomfish, precious corals, crustacean and coral reef ecosystem MUS.

As shown above, areas of ocean bottom have been designated EFH and HAPC for precious corals, crustaceans, bottomfish and coral reef ecosystem MUS. The use of explosives, poisons, trawl nets, and other destructive gears which may adversely affect any EFH or HAPC in the Western Pacific Region is prohibited. No fishery under Council jurisdiction has been found to adversely affect the EFH or HAPC of any Western Pacific Region MUS. A recent study of two NWHI banks by Kelley and Moffitt (2004) found that bottomfishing did not affect habitat or other marine resources.

2.2.7 Protected Species

Protected species are genrally considered to include those species listed as endangered or threatened under the Endangered Species Act (ESA), all marine mammals, listed or not, as they are protected under the Marine Mammal Protection Act (MMPA), and all seabirds. A summary of information on those species believed to potentially occur in the proposed NWHI sanctuary is presented below.

2.2.7.1 Marine Mammals

Protected marine mammals fall into two categories: species listed under the ESA and those species which are not listed, but otherwise protected under the MMPA. Cetaceans and pinnipeds are discussed separately in the sections below.

Listed Cetaceans

The six species of cetaceans listed under the ESA that occur within the Hawaiian Archipelago are found in Table 9. Although these whales may be found within the proposed sanctuary boundaries, there are no reported or observed interactions with the fisheries which may operate within the NWHI sanctuary.

Table 9: ESA listed Cetacea of the Hawaiian Archipelago

Common Name	Scientific Name
Blue whale	*Balaenoptera musculus*
Fin whale	*Balaenoptera physalus*
Humpback whale	*Megaptera novaeangliae*
Sei whale	*Balaenoptera borealis*
Sperm whale	*Physeter macrocephalus*
Right whale	*Eubalaena glacialis*

Other Cetaceans

Species of whales that are not listed under the ESA but are protected under the MMPA and occur around the Hawaiian Archipelago are listed in Table 10.

Table 10: Non-ESA listed Cetacea of the Hawaiian Archipelago

Common Name	Scientific Name
Blainsville beaked whale	*(Mesoplodon densirostris*)
Bottlenose dolphin	(*Tursiops truncatus)*
Bryde's whale	(*Balaenoptera edeni*)
Cuvier's beaked whale	*Ziphius cavirostris*
Dwarf sperm whale	*Kogia simus*
False killer whale	*Pseudorca crassidens*
Killer whale	*Orcinus orca*
Melon-headed whale	*Peponocephala electra*
Pygmy killer whale	*Feresa attenuata*
Pygmy sperm whale	*Kogia breviceps*

Common Name	Scientific Name
Risso's dolphin	*Grampus griseus*
Rough-toothed dolphin	*Steno bredanensis*
Short-finned pilot whale	*Globicephala macrorhynchus*
Spinner dolphin	*Stenella longirostris*
Spotted dolphin	*Stenella attenuata*
Striped dolphin	*Stenella coeruleoalba*
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*
Minke whale	*Balaenoptera acutorostrata*
Dall's porpoise	*Phocoenoides dalli*
Fraser's dolphin	*Lagenodelphis hosei*
Longman's beaked whale	*Indopacetus pacificus*

From the list above, only the bottlenose dolphin (*Tursiops truncatus*) has been documented to interact with a NWHI fishery. Bottlenose dolphins have been observed stealing hooked fish off of bottomfish lines, the extent of such interactions are not known and are believed to be low. Bottlenose dolphins are widely distributed throughout the world in tropical and warm-temperate waters (Reeves et al. 1999). Average size at birth is 0.9 to 1.2 m and 8 - 9 kg. Maximum size reported is 3.9 m and 275 kg. Males are sexually mature at 10 - 12 years of age, females between 5 and 12 years. Once reproductively active, females bear a single calf every second or third year. Gestation is about 12 months. Calves are nursed for a year or more. Maximum age appears to be 46 - 48 years, based on tooth growth analysis of both wild and captive dolphins.

The bottlenose dolphin is primarily coastal, but populations also occur in offshore waters. The species is common throughout the Hawaiian archipelago, usually within five miles of emergent land or shallow banks (Shallenberger 1981). School sizes range from single animals and small groups (3-10 individuals) to aggregations of more than 100 individuals. A combined aerial and vessel survey indicated at least 430 individuals in the shallow waters around the MHI (Nitta and Henderson 1993). Data suggest that the bottlenose dolphins in Hawaiʻi belong to a separate stock from those in the eastern tropical Pacific (Scott and Chivers 1990). The status of bottlenose dolphins in Hawaiian waters relative to their optimum sustainable population (OSP) is unknown, and there are insufficient data to evaluate trends in abundance or carrying capacity of the region (Forney et al. 2000). The relative impact of the bottomfish fishery on the behavior or foraging success of bottlenose dolphins is unknown, but thought to be minimal.

Although the other species listed above may be found within the action area and could interact with NWHI fisheries, no reported or observed interactions have ever been reported or observed.

Listed Pinniped: The Hawaiian Monk Seal

In 1976, the Hawaiian monk seal was listed as endangered under the ESA following a 50 percent decline in beach counts from the late 1950s to the mid-1970s (41 FR 33922). It was also designated a depleted species in 1976 under the MMPA, and its population is considered to be below sustainable levels. The Hawaiian monk seal is the most endangered pinniped in U.S. waters and is second only to the northern right whale as the nation's most endangered marine mammal (Marine Mammal Commission 1999). The Hawaiian monk seal is also the only endangered marine mammal that exists wholly within the jurisdiction of the U.S.

The Hawaiian Monk Seal Recovery Team (HMSRT), appointed pursuant to the ESA in 1980, is a forum, supported by NMFS, in which issues involving recovery planning and implementation are discussed and recommendations for actions forwarded to NMFS. In 1982, the HMSRT completed the Hawaiian Monk Seal Recovery Plan. The highest priority activities identified by that report are those that support the following recovery-related objectives:1) Determine the ultimate and proximate factors influencing population dynamics at each of the six major breeding locations; 2) Enhance survival of female Hawaiian monk seals and their pups to maximize reproductive potential and population growth; 3) Facilitate recovery of the depleted populations; and 4) Mitigate human impacts (HMSRT 1999).

Under the ESA, critical habitat may be designated to afford protection or special management consideration to physical or biological features essential to the conservation of a listed species. In May 1988, NMFS designated critical habitat for the Hawaiian monk seal out from shore to 20 fathoms in 10 areas of the Northwestern Hawaiian Islands. Critical habitat for this species includes "all beach areas, sand spits and islets, including all beach crest vegetation to its deepest extent inland, lagoon waters, inner reef waters, and ocean waters out to a depth of 20 fathoms around the following: Pearl and Hermes Reef, Kure Atoll, Midway Islands, except Sand Island and its harbor, Lisianski Island, Laysan Island, Maro Reef, Gardner Pinnacles, French Frigate Shoals, Necker Island, and Nihoa Island" (53 FR 18990, May 26, 1988, 50 CFR § 226.201). Critical habitat was designated in order to enhance the protection of habitat used by Hawaiian monk seals for pupping and nursing, areas where pups learn to swim and forage, and major haul-out areas where population growth occurs.

Biology and Distribution

Monk seals are phocids, and are one of the most primitive genera of seals. They are brown to silver in color, depending upon age and molt status, and can weigh up to 270 kg. Adult females are slightly larger than adult males. Monk seals are solitary, and it is thought they can live up to 30 years. Females reach breeding age at about 5 to 10 years of age, depending on their condition, and can give birth about once every year. An estimated 40-80 percent of adult females give birth in a given year (NMFS unpub. data. 2001). After birth, pups nurse for 5-6 weeks, during which time the mother rarely, if at all, leaves the pup to feed. At weaning, the mother leaves and the pup must subsequently forage independently. Newly weaned pups tend to stay in the reef shallows, entering into more diverse and deeper waters to forage as they gain experience. Monk seals may stay on land up to about two weeks during their annual molt. Hawaiian monk seals are nonmigratory, but recent studies show their home ranges may be extensive (Abernathy and Siniff 1998). Counts of individuals on shore compared with enumerated subpopulations at some of the NWHI indicate that Hawaiian monk seals spend about one-third of their time on land and about two thirds in the water (Forney et al. 2000).

The Hawaiian monk seal breeds only in the Hawaiian Archipelago, with most monk seals inhabiting the remote, largely uninhabited atolls and surrounding waters of the NWHI.
More than 90 percent of all known pups are born at six NWHI breeding colonies which include French Frigate Shoals, Laysan Island, Pearl and Hermes Reef, Lisianski Island, Kure Atoll and Midway Atoll. A few births also occur annually at Necker, Nihoa, and Ni□ihau Islands and in the main Hawaiian Islands. NMFS researchers have also observed Hawaiian monk seals at Gardner Pinnacles and Maro Reef. Although Hawaiian monk seals occasionally move between islands, females generally return to their natal colony to pup. Since 1990, there has been an increase in the number of Hawaiian monk seal sightings and births in the main Hawaiian Islands (HMSRT 1999; Johanos 2000). A 2001 aerial survey determined a minimum abundance of 52 seals in the MHI (Baker and Johanos, 2003). Table 11 shows that monk seal births in recent years are increasing.

Table 11: Known Hawaiian Monk Seal Births in the MHI

Year	Niihau	Kauai	Oahu	Molokai	Maui	Kahoolawe	Hawaii	Total
1962	?	1	0	0	0	0	0	1
1988	?	1	0	0	0	0	0	1
1991	1	1	1	0	0	0	0	3
1992	?	1	0	0	0	0	0	1
1996	?	0	1	1	0	0	0	2
1997	?	0	1	1	1	0	0	3
1998	?	0	2	1	1	0	0	4
1999	?	1	0	1	1	0	0	3
2000	2	4	0	1	0	0	0	7
2001	5	3	0	2	0	1	1	12
2002	?	1	0	2	0	0	1	4
2003	?	2	1	4	0	1	2	10

(Source: PIFSC 2003)

Hawaiian monk seals feed on a wide variety of teleosts, cephalopods and crustaceans, indicating that they are highly opportunistic feeders (Rice 1964; MacDonald 1982; Goodman-Lowe 1998). Research to identify prey species is currently underway using several methods: collection of potential prey items and blubber samples for fatty acid analysis; Crittercam[3] recording of foraging behavior; correlation of dive/depth/location profiles with potential prey species habitat; and analysis of Hawaiian monk seal scat and spew samples for identifiable hard parts of prey. Table 12 identifies adult male Hawaiian monk seal prey families as indicated by Crittercam studies at French Frigate Shoals.

Table 12: Crittercam Study-Prey Items Eaten at French Frigate Shoals

FAMILY	NUMBER SEEN
Anthiinae	2
Balistidae	1
Bothidae	1
Cheilinninae	2
Congridae	1
Pentacerotidae (groundfish)	1
Pomacentridae	1
Tetradontidae	1
Unidentified Eels	2
Unidentified fish	8
Octopus	2

(Source: Parrish et al. 2000; WPRFMC 2000a)

In a study at five of the principle breeding sites for the Hawaiian monk seal (FFS, Laysan Island, Lisianski Island, Pearl and Hermes Reef, and Kure Atoll) focused on identifying items eaten by Hawaiian monk seals, Goodman-Lowe (1998) analyzed scat and spew samples to identify prey, and to obtain size estimates of the more common cephalopod prey species.[4] This study also examined the temporal differences in diet among years. The frequency of occurrence (FO) was calculated as the number of samples in which an identified prey type was found. The percent frequency of occurrence (percent FO) was calculated as the FO divided by the total number of scat and spew samples analyzed (n=940) (Table 13).

[3]A Crittercam is a self-contained video camera that has been mounted on a Hawaiian monk seal to record its foraging behavior.

[4]Scat and spew analysis is known to be biased due to differential digestion of various prey types. However, scat and spew analysis is, at this time, the best available scientific information for investigating Hawaiian monk seal diets.

Table 13: Goodman-Lowe Results of Prey Found in Scat and Spew Samples

FAMILY	FO/%FO n=940
Unidentified Eels	207/22.0
Labridae	194/20.6
Holocentridae	135/14.4
Balistidae	123/13.1
Scaridae	99/10.5
Acanthuridae	71/7.6
Pomacentridae	44/4.7
Tetradontidae	41/4.4
Kyphosidae	32/3.4
Monacanthidae	29/3.1
Synodontidae	25/2.7
Pomocanthidae	17/1.7
Kuhliidae	14/1.5
Cirrhitidae	12/1.3
Chaetodontidae	10/1.1
Diodontidae	10/1.1
Bothidae	9/0.9
Cheilodactylidae	6/0.6
Scorpaenidae	5/0.5
Ostraciidae	1/0.1
Muraenidae	53/5.6
Congridae	52/5.5
Priacanthidae	40/4.3
Apogonidae	9/0.9
Opichthidae	6/0.6

FAMILY	FO/%FO n=940
Mullidae	58/6.2
Lutjanidae	24/2.6
Carangidae	11/1.1
Polymixiidae	9/1.0
Serranidae	5/0.5
Belonidae	1/0.1
Unidentified remains	330

Source: Goodman-Lowe 1998

The results indicated that Hawaiian monk seals are opportunistic predators that feed on a wide variety of available prey as compared to the case of other seals in which the bulk of the diet is made up of only a few species (Goodman-Lowe 1998). The analysis revealed that teleosts (bony fish) were the most represented prey (78.6 percent) followed by cephalopods (15.7 percent) and crustaceans (5.7 percent). The most common teleost families found were eels (22.0 percent), Labridae (20.6 percent), Holocentridae (14.4 percent), Balistidae (13.1 percent) and Scaridae (10.5 percent). All teleost families found include common, shallow-water reef fishes, except for the beardfish family, Polymixiidae (1.0 percent), which is recognized to consist of deep-water benthic fish. The deep-water Polymixiidae are not caught in the bottomfish fishery either as target or bycatch species. Evidence of target species such as snapper and grouper appeared infrequently in fecal and regurgitate samples.

An ongoing study contracted by NMFS is using quantitative fatty acid signature analysis to identify which prey items are most important to the various age and sex components of the several island populations of Hawaiian monk seals. The first report detailing the collection and fatty acid analyses of prey specimens is expected in FY05. A final report should be completed in early FY06. Preliminary findings of the fatty acid study suggest that there are variations in diets among individual Hawaiian monk seals as well as diet variation among demographic groups and groups in different locations (Antonelis, 2005 pers. comm.).

Information about the foraging activities of Hawaiian monk seals is available through the dive/depth/location profiles and the correlation with the habitat of potential prey families.
The foraging and dive patterns of Hawaiian monk seals and the availability of prey items to Hawaiian monk seals are important to understand when determining the potential impact of fisheries in terms of areas fished, potential for gear interactions, and prey competition. The foraging range of the Hawaiian monk seal extends to areas managed under the all FMPs. Various studies have been undertaken to determine the habitat use patterns of Hawaiian monk seals (Schlexer 1984; DeLong et al. 1984; Abernathy and Siniff 1998; Stewart 1998; Parrish et al. 2000). These studies used various technologies, including radio tags, dive depth recorders,

Crittercams, and satellite telemetry, to study the foraging behavior of Hawaiian monk seals. The results of these studies vary by location.

DeLong et al. (1984) instrumented seven Hawaiian monk seals at Lisianski Island with radio transmitters and multiple depth of diving recorders and recorded movements for an aggregate of 94 days in which 4,817 dives were recorded. Most dives (59 percent) were in the 10-40 m depth range, and the remainder of dives were to deeper depths. Thirteen dives were recorded to depths of at least 121 m. The outer edge of the reef around Lisianski Island is generally delineated by the 40 m isobath. The study concluded that during breeding season at Lisianski Island males depend entirely upon the food resources on the coral reefs, sandy beach flats and deeper reef slopes around that island.

Schlexer (1984) also recorded diving patterns of Hawaiian monk seals at Lisianski Island. In that study, eight Hawaiian monk seals (five adult males, one juvenile male, one subadult female, and one juvenile female), tracked with radio transmitters and multiple depth of diving recorders, were recorded diving within the 0 - 70 m range. One subadult female and one juvenile female dove in the shallow range of 10 - 40 m, with some dives recorded from 150 - 180 m. None of the adult males instrumented dove to depths greater than 70 m.

Stewart (1998) investigated diving patterns of 24 Hawaiian monk seals at Pearl and Hermes Reef using satellite-linked radio transmitters to record dive depth and duration. That study concluded that the Hawaiian monk seals at Pearl and Hermes Reef foraged in relatively shallow waters, and that foraging activity was different for males and females and among age classes. At Pearl and Hermes Reef, juveniles foraged almost exclusively within the fringing reef, adult males foraged mostly on the inside and outer edge of the fringing reef, and adult females foraged mostly within the center of the atoll and near the atoll's southwestern opening (Stewart 1998). Adult males generally dove within the 8 - 40 m range, with a secondary mode at 100 - 120 m. Male juveniles generally dove within the 8 - 40 m range. Adult females rarely dove deeper than 40 m, although one female made a number of dives to 60 - 140 m.

Abernathy and Siniff (1998) instrumented adult seals at FFS with satellite-linked time depth recorders. Data showed that instrumented adult male Hawaiian monk seals appeared to utilize the banks to the northwest, with a daytime diving range between 50 - 80 m and a nighttime range between 110 - 190 m. The study also suggested that seals that did not leave the vicinity of FFS rarely dove deeper than 80 m during the day, but made more dives closer to 80 m at night. The study also identified a few seals that were extremely deep divers. These seals' daytime dives reached depths > 300 m on a ridge to the east of the atoll. The researchers modeled the home range of individuals and concluded that the average home range was 6,467 km^2 (n=28, SE=3,055 km^2). For example, individuals were documented traveling between FFS and Gardner Pinnacles, St. Rogatien Bank, Brooks Bank, and Necker Island. The conclusion was that Hawaiian monk seals forage on benthic (bottom) and epibenthic (near bottom) species, in addition on other prey items in the fringing reef complex.

Parrish et al. (2000) provided further information that Hawaiian monk seal foraging behavior and range are extensive. Twenty-four Hawaiian monk seals were outfitted with Crittercams. The

Crittercam recorded the habitat depth and bottom type at locations where Hawaiian monk seals were identified as successful in the capture of prey items. It was found that the diurnal pattern of foraging by male adults occurred mainly at the 60 m isobath. A few seals foraged at depths >300 m. Some of these areas were outside the critical habitat area and overlapped with areas fished by both lobster and bottomfish fisheries.

Since 1995, the abundance of shallow water (<20 m) reef fish has been surveyed at FFS and Midway. The data are checked as a potential indicator of changes in the abundance of Hawaiian monk seal prey. The surveys are conducted annually by NMFS and are designed to detect changes of 50 percent or greater in fish densities (Laurs 2000). The surveys have not indicated any statistically significant changes in prey abundance at either site (DeMartini and Parrish, 1996; DeMartini et al. 1999; DeMartini et al. 2002).

Recent information suggests Hawaiian monk seals may forage in beds of precious corals, some of which are habitat for known Hawaiian monk seal prey items such as arrowtooth eels (Parrish et al. 2002). In 2000, the National Undersea Research Laboratory conducted a study using manned and unmanned submersibles in known beds of the Western Pacific region. The objective of the study was to test the hypothesis that gold coral provided habitat for deep-water arrowtooth eels. Results of the study found that gold coral did not seem to aggregate arrowtooth eels or any other significant fish assemblage. At the Cross Seamount, the study found arrowtooth eels in areas adjacent to the beds, but without the presence of gold corals (Parrish 2001). A recent study using a submersible was conducted in the NWHI and MHI to evaluate the possibility that precious coral beds aggregate fish. The study found that it is unlikely that fish aggregations at such depths are dependant up precious corals for habitat and relief, but that precious corals and fish share habitat that has high relief and high nutrient flow, i.e. co-occurrence and not a dependancy of fish on corals (Parrish, 2005 pers. comm).

Overall, the science of the Hawaiian monk seal diet and foraging preferences indicate the monk seals eat a variety of prey species and forage at varying depths. There is not one single prey item that has been determined to be essential in the success of monk seals. Hawaiian monk seals are a high level predatory mostly foraging within coral reef ecosystems that support a variety of prey species.

Population Status and Trends

Little is known about Hawaiian monk seals or their population status before the 1950s. As a result of natural constraints, the species was probably never very abundant, presumably numbering, at most, in the thousands (as opposed to hundreds of thousands) (Ragen and Lavine 1999). The arrival of humans in the Hawaiian Islands may have reduced the range of the Hawaiian monk seal largely to the NWHI and contributed to its current endangered status. In historic times, human-related mortality appears to have caused two major declines of the Hawaiian monk seal (NMFS 1997; Marine Mammal Commission 2000). It generally is acknowledged that the species was heavily exploited in the 1800s during a short-lived sealing venture. Several island populations may have been completely eliminated during that period. The second major decline occurred after the late 1950s and appears to have been determined by the pattern of human disturbance from military activities at Kure Atoll, Midway Atoll and FFS. Such disturbance caused pregnant females to abandon prime pupping habitat and nursing females to abandon their pups. The result was a decrease in pup survival, which led to poor reproductive recruitment, low productivity and population decline (NMFS 1997; Marine Mammal Commission 2000).

When monk seal population measurements were taken in the 1950s, the population was already considered to be in a state of decline. The minimum population estimate (N_{MIN}) for monk seals is 1378 individuals (based on a 2001 enumeration of individuals of all age classes at each of the subpopulations in the NWHI, derived estimates based on beach counts for Nihoa and Necker, and estimates for the MHI) (Draft 2003 Stock Assessment Report). The PIFSC estimates the population to be 1300 to 1400 individuals (PIFSC 2003). Figure 2 illustrates the long-term trend in total non-pup beach counts.

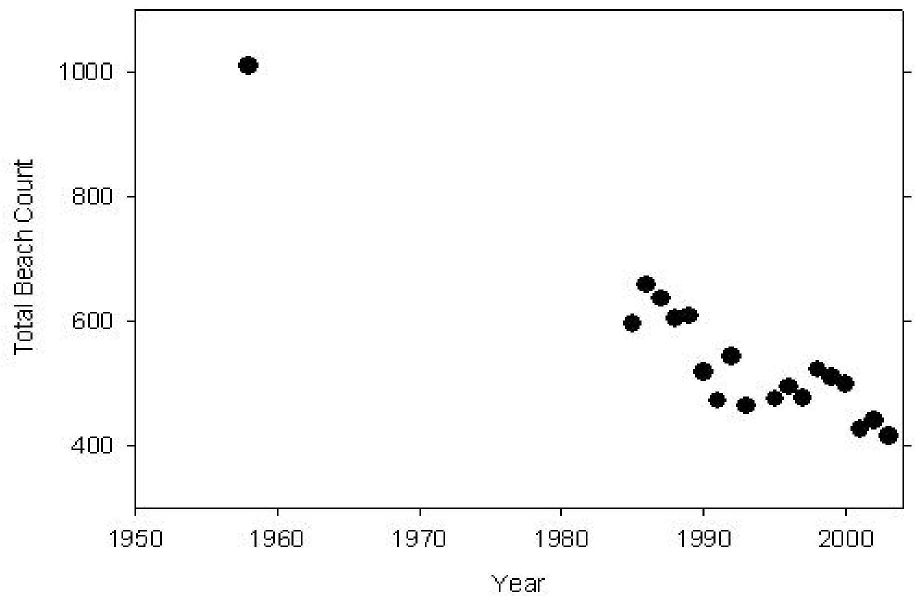

Figure 2: Non-pup Beach Counts of the Six Main NWHI Monk Seal Subpopulations
(Source: PIFSC 2003)

Various surveys of the islands and atolls in the NWHI that support the main monk seal breeding subpopulations indicate that the NWHI non-pup population (juveniles, sub-adults and adults) declined 60 percent between the years 1958 and 1999. Trends in subpopulations are measured by beach counts for each of these subpopulations. Trends vary within the NWHI. For example, from 1990 to 1998, the subpopulation at Lisianski Island decreased slightly, and the Laysan Island subpopulation increased slightly. The subpopulation at Kure Atoll increased at about 5 percent per year from1983 to 1998. The subpopulation at Pearl and Hermes Reef experienced the highest increase of 7 percent per year between 1983 and 1998. Researchers have been able to establish the minimum count of individuals in the main breeding subpopulations, and in 2001 the count of monk seals was 182 at Lisianski Island, 300 at Laysan Island, 122 at Kure Atoll, 322 at FFS, 259 at Pearl and Hermes Reef and 64 at Midway Atoll (NMFS, unpub. data). Figure 3 illustrates trends in beach counts (a relative measure of population size) of Hawaiian monk seals for each of the principle Hawaiian monk seal breeding areas in the NWHI.

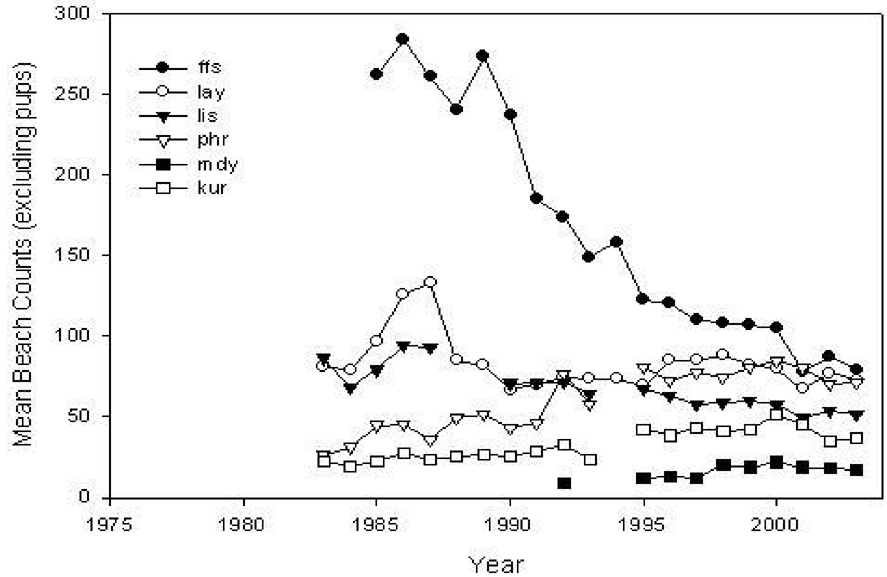

Figure 3: Trends in Non-pup Beach Counts of Monk Seals at Major NWHI Breeding Areas
(Source: PIFSC 2003)

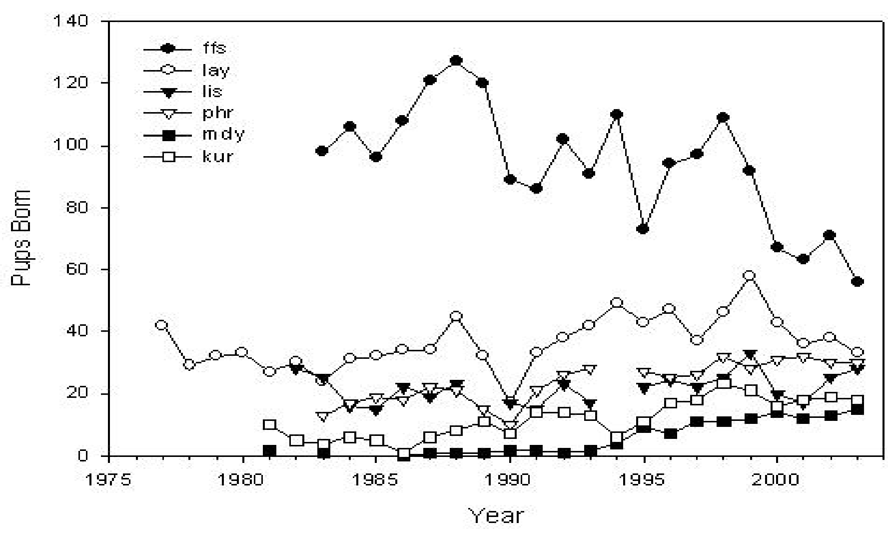

Figure 4: Mean Beach Counts of Pups Born at Major NWHI Breeding Areas
(Source: PIFSC 2003)

The overall population decline is primarily attributable to low reproductive recruitment and high juvenile mortality at the largest of the subpopulations at FFS. At this site, the average beach count of animals older than pups is now less than half the count in 1989. In the late 1990's, poor survival of pups resulted in a relative paucity of young seals, so that further decline is expected for this subpopulation as adults die and there are few immature seals to replace them. The recent trend in mean beach counts for births can be found in Figure 4. Over the last decade, the causes of the survival for these age classes at FFS have been related to poor condition from starvation, shark predation, and male aggression. A decrease in prey availability may be the result of decadal scale fluctuations in productivity and corresponding or other changes in local carrying capacity for seals at FFS or a combination of factors (Craig and Ragen 1999; Polovina et al. 1994; Polovina and Haight 1999). While other subpopulations of monk seals in the Northwestern Hawaiian Islands are stable, increasing or declining slightly, the overall population status is being driven by the FFS population, which comprises about 25 percent of the total monk seal population. However, the girth of weaned pups at FFS, which may correlate with prey availability to females during gestation and resulting increased ability to nourish pups, has increased in recent years. Mean girth of pups at the other major breeding subpopulations has remained stable or increased in recent years (PIFSC 2003).

Population trends for this species are determined by the highly variable dynamics of the six main reproductive subpopulations. At the species level, demographic trends over the past decade have been driven primarily by the dynamics of the FFS subpopulation. In the near future, the general population trends for the species will depend on the gains and losses at FFS, the other major reproductive subpopulations, and small subpopulation in the MHI.

Factors Influencing Population Size

This section is a summary of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat (including designated critical habitat) and ecosystem within the NWHI and the MHI, together with Johnston Atoll the only areas within the Western Pacific Region harboring Hawaiian monk seals.

During the past four decades the Hawaiian monk seal population has been affected by human and natural factors (Marine Mammal Commission 1999). Natural factors have included shark predation, disease, attacks by aggressive adult male Hawaiian monk seals on females and immature seals of both sexes (called “mobbing”), and reduced prey availability. Human factors have included various types of interactions with humans, their structures, contaminants and debris, fishing operations and vessel traffic. At each colony, differing combinations of these factors likely have contributed to local trends in abundance, with the relative importance of individual factors changing over time (Marine Mammal Commission 2000). The reported causes of relatively recent changes in Hawaiian monk seal abundance are described in greater detail below.

Mobbing: Male aggression, including singular or multiple adult males attacking another seal (mobbing), can lead to Hawaiian monk seal injury and death. The deaths can be a direct result of injuries inflicted by the aggressive males or as a result of later shark attacks on wounded seals or pups chased into the water by aggressive males. Mobbing of females and immature seals by adult males is a source of mortality at FFS, Laysan Island and Lisianski Island. Evidence suggests that during the mid- to late-1990s, male Hawaiian monk seal aggression and shark predation contributed significantly to the mortality of weaned and pre-weaned pups at FFS (HMSRT 1999). At FFS, individual adult males have presented more of a problem than groups of males.

Individuals which were directly observed injuring or killing pups were removed, either by translocation or euthanasia. At Laysan Island, injuries and deaths have tended to result from massed attacks, or mobbings, by large numbers of adult males. The primary cause of mobbing is thought to be an imbalance in the adult sex ratio, with males outnumbering females (NMFS 1998). Males that were removed from Laysan Island included seals which had been observed participating in mobbings, as well as other animals whose behavioral profile matched that of known "mobbers." Removal was effected either by translocation or by transfer into permanent captivity. Ten males were removed in 1984, 5 in 1987, and 22 in 1994.

Removal of individual male seals from French Frigate Shoals markedly decreased the number of injuries and deaths attributable to adult male aggression. The results of removing adult males from Laysan Island are less clear. Injuries and deaths from adult male aggression at Laysan Island have diminished, but it is not known how much male removal has contributed to this decline.

Shark Predation: Predation by Galapagos sharks (*Carcharhinus galapagensis*) and perhaps tiger sharks (*Galeocerdo cuvieri*) of Hawaiian monk seal pups seems to be increasing in occurrence, as 17 (18 percent), 16 (15 percent) and 25 (27 percent) pup mortalities or disappearances were believed to be associated with shark attacks at FFS in 1997, 1998 and 1999, respectively (HMSRT 1999). In 1999, shark predation may have accounted for the deaths of 51 percent (23 of 45) of the pups born at Trig Island in FFS (2002 Biological Opinion). Overall, 9.4 percent (25 out of 244) of pups born in the NWHI were inferred or known to be preyed upon by sharks in 1999. The PIFSC infers shark related mortality whenever a newborn to approximately three week old pup disappears at FFS, especially during periods when large sharks are observed patrolling near pupping beaches. Shark predation is inferred to be the primary cause of disappearance of these pups because attacks by male adults (the other possible primary cause of mortality) are unlikely because nursing pups are defended by their mothers. However, sharks have been observed killing pups in this age category despite their mother's defense tactics against shark predation. According to the HMSRT (1999), a preliminary analysis of the impacts of shark predation on the recovery of the FFS population of Hawaiian monk seals indicates that the mitigation of this interaction is essential to the recovery of this population. The HMSRT recommended that NMFS undertake a program to remove Galapagos and/or tiger sharks observed patrolling beaches where Hawaiian monk seal pups are present within the FFS atoll. One shark was removed pursuant to a shark removal plan implemented by NMFS in 2000 to improve pup survival and possibly slow the FFS population decline.

The dramatic increase in deaths and disappearances from shark attacks at FFS has been the result of an increased number of Galapagos sharks (*Carcharhinus galapagensis*) in the immediate vicinity of Hawaiian monk seal pupping areas. The occurrence and escalation of Galapagos shark predation on pups may be related to an episode of adult male Hawaiian monk seal aggression against pups, which resulted in pup deaths and the presence of carcasses remaining in the waters surrounding the pupping area. These carcasses may have attracted sharks to the new prey resource of nursing seal pups. Also, the erosion of Whale-Skate Island (FFS), which had been a large pupping site, may have resulted in more pups being born at Trig Island (FFS) where sharks can easily approach the shoreline.

Disease: Although some information concerning medical conditions affecting the Hawaiian monk seal is available, the etiology and impact of disease on wild animals at the population level is far from clear. There are substantial data gaps regarding the prevalence of disease conditions in populations of Hawaiian monk seals in the wild, and thus their potential impact on population dynamics is unknown. In the wild, even massive epizootics in remote locations may pass undetected (Aguirre et al. 1999).

There have been periods of unusually high mortalities in subpopulations located in the NWHI. A die-off occurred in 1978 at Laysan Island (Johnson and Johnson 1981). More than 50 seal carcasses were found in an advanced state of decomposition, and although the cause of the mortality was not identified, it may have been disease related. Also, survival of immature seals severely declined at FFS after 1987, and the reproductive potential of the species was being seriously compromised by the loss of young females. The cause has been attributed to emaciation/starvation; however, the role of endoparasites or disease is unknown. During 1992-93, undersized pup and juvenile seals from FFS were rehabilitated and released at Midway Atoll with poor success.

Health assessment and collection of baseline information on diseases is considered important to the recovery of the Hawaiian monk seal population (Gilmartin 1983; Aguirre et al. 1999). Banish and Gilmartin (1992) summarized pathological conditions found in 42 carcasses recovered from 1981 to 1985. Frequent findings included parasites, trauma, cardiovascular disease, and respiratory infections. Emaciation was a common condition. Banish and Gilmartin (1992) did not assess causes of death from any of their samples, but nonetheless concluded that there was no evidence of any disease phenomenon affecting the population in a manner which would significantly hinder recovery of the species. A series of examinations of 23 dead seals collected from 1989 to 1995 (Work unpubl. data) ascribed causes of death as follows: emaciation (7); emaciation compounded by senescence (1); trauma (2); foreign body aspiration (1); and euthanasia (1). Cause of death was not determined in 11 animals.

The relative significance of disease and related factors and their effect on population trends are poorly understood. Disease processes may be important determinants of population trends through long-term low levels of mortality, or through episodic die-offs. Table 14 describes the findings of health and disease studies on Hawaiian monk seals between 1925 and 1997.

Table 14: Health and Disease Studies in Hawaiian Monk Seals

YEAR	HEALTH CONDITION AND REFERENCE
1925	Internal parasites were first reported (Chapin 1925).
1952	Diphyllobothriid cestodes were first reported (Markowski 1952).
1959	The Acanthocephalan *Corynosoma* sp. was first reported (Golvan 1959).
1969	Diphyllobothriid cestodes were reported (Rausch 1969).

YEAR	HEALTH CONDITION AND REFERENCE
1978	Known as the Laysan epizootic, $\geq$50 Hawaiian monk seals were found dead. Specimens from 19 dead and 18 live seals were collected. All carcasses found with stomach ulceration and heavy parasite burdens and in severe state of emaciation. Livers from two carcasses tested positive to ciguatoxin and maitotoxin. There was serologic evidence of caliciviruses but serum specimens were negative for *Leptospira. Salmonella sieburg* was isolated from a rectal swab. Many parasite ova and products in coprologic exams were identified. Diagnosis was inconclusive (Johnson and Johnson 1981; Gilmartin et al. 1980).
1979	*Contracecum* ulceration of a young seal was first reported (Whittow et al. 1979).
1980	Lung mites from the family Halarechnidae were first reported (Furman and Dailey 1980).
1980	The Hawaiian monk seal die-off response plan was developed with the support of the Marine Mammal Commission (Gilmartin 1987).
1983	The Recovery Plan for the Hawaiian Monk Seal addressed the importance of disease investigations (Gilmartin 1983).
1988	A coprologic survey for parasites was performed from field scats collected in 1985 (Dailey et al. 1988).
1988	The hematology and serum biochemistry of 12 weaned pups collected between 1984 and 1987 for their rehabilitation in Oahu were reported (Banish and Gilmartin 1988).
1992	Pathology of 42 seals collected between 1981-85 were summarized (Banish and Gilmartin 1992).
1992	The FFS relocation of 19 immature seals was initiated. Basic hematology, serum biochemistry, serology for leptospirosis and calicivirus infection, virus isolation, fecal culture for *Salmonella* and coproparasitoscopic examination were performed for their disease evaluation. Two of seven seals died of bacterial and aspiration pneumonia on Oahu, with positive titers to *Leptospira*. Detection of calicivirus by cDNA hybridization probe in 13 seals with viral particles seen by electron microscopy occurred in five seals. It was concluded that endemic disease agents identified in those seals were *Salmonella* and endoparasites (Gilmartin 1993a; Poet et al. 1993).
1993	Inoculation of four Hawaiian monk seals with a killed virus distemper vaccine was experimentally performed on three seals at the Waikiki Aquarium (Gilmartin 1993b; Osterhaus unpubl. data 1997).
1995	An eye disease of unknown etiology was first diagnosed in 12 female Hawaiian monk seal pups that were transported to Oahu for rehabilitation. To date the cause remains unknown (NMFS files 1995-97 unpubl. data).
1996	Histopathology of selected tissues collected from 23 seals between 1989 and 1995 was performed by personnel of the National Wildlife Health Research Center, Honolulu Station (Work unpubl. data 1996).

YEAR	HEALTH CONDITION AND REFERENCE
1997	Two captive seals died of causes unrelated to the eye disease. One seal was diagnosed with *Clostridium* septicemia and another seal with hepatic sarcocystosis (Yantis et al. 1998).
1997	The Monk Seal Captive Care Review Panel developed recommendations to evaluate the health assessment and future disposition of 10 captive seals and the future of captive care and release efforts to enhance the recovery of the species (NMFS unpubl. data 1997).

(Source: Aguirre et al. 1999)

In April, 2001, an "Unusual Mortality Event[5]" was declared on the basis of four juvenile Hawaiian monk seal deaths within nine days at Laysan Island, a death of a yearling at Midway, discovery of three decomposed carcasses (one subadult, one pup, and two juveniles) and one fresh dead carcass at Lisianski Island, a death of a yearling at FFS, and lethargic, thin juvenile Hawaiian monk seals observed at Laysan and Midway Islands. The relationship of these deaths and observed conditions of the seals is not known at this time (NMFS unpub. data 2001). The Working Group on Unusual Mortality Events (WGUME) reviewed the available information and recommended on February 5, 2002, to close the event. Necropsies and sample analyses have revealed no unusual findings, and there have been no new reports of juveniles exhibiting abnormal behavior or thin body conditions. The WGUME also recommended that measures should be taken so that field teams are fully trained in proper sample collection techniques should any dead seals be found in 2002, to ensure that all possible information can be collected and preserved. The group also recommended performing as many necropsies as possible on fresh carcasses to collect essential data. A report summarizing the event and the results of the subsequent investigation are expected in the near future.

Reduced Prey Availability: One of the potential explanations of the poor juvenile survival at FFS from 1989 to the mid-1990s is limited prey availability and subsequent effects on both adults and juveniles. There are two factors related to food that influence weaned pup survival: 1) the amount of food (milk) pups acquire from their mothers prior to weaning and 2) the amount of food available to pups immediately after weaning (G. Antonelis pers. comm. 2000). The first factor is related to the mother's condition and ability to forage successfully prior to parturition and may be viewed as an indicator of prey availability during gestation. The second factor is related to the pup's ability to forage successfully after weaning. Evidence of limited prey availability at FFS included small and, in some cases, emaciated pups, juveniles that were smaller and thinner than those at other colonies and delayed sexual maturity of adult females (Craig and Ragen 1999; Marine Mammal Commission 2000).

[5]The MMPA defines an Unusual Mortality Event (UME) to be an occurrence which: 1) is unexpected; 2) involves a significant die-off of a marine mammal population; and 3) demands an immediate response. In addition to the above conditions, an immediate response is warranted under two other circumstances: 1) mass stranding of an unusual species of cetacean; and 2) small numbers of a severely endangered species of marine mammal are affected.

Further evidence of limited prey availability at FFS has been provided by satellite-linked, time-depth recorders that have been used to track movements and record diving patterns of Hawaiian monk seals at various locations. All but one of the six juvenile and 18 adult Hawaiian monk seals tracked at Pearl and Hermes Reef foraged either within the fringing reef or just outside the reef (Stewart 1998). Most dives were to depths of 8 to 40 m, though there was a secondary mode at 100 to 120 m. In contrast, Hawaiian monk seals studied at FFS, where the population of seals is considerably larger, exhibited more variation in their habitat use (Abernathy and Siniff 1998; Parrish et al. 2000; Parrish et al. 2002). Abernathy and Siniff (1998) recorded that the most prevalent pattern, particularly among males, was utilization of the banks to the northwest (some of which are more than 200 km from FFS), with daytime diving in the 50 to 80 m range and a nocturnal or crepuscular shift to the 110-190 m range. The next most common group included seals that did not leave the vicinity of FFS and rarely dived deeper than 80 m. Finally, a small number of seals made many dives greater than 300 m. Abernathy and Siniff (1998) suggested that reduced prey availability could account for the greater variety of foraging patterns at FFS as some individuals are forced to venture to new areas and alter their prey base.

The decrease in prey at FFS may have been the result of large-scale natural perturbations in ecosystem productivity and corresponding or other changes in local carrying capacity for seals at FFS or a combination of factors. From the mid-1970s to late 1980s, the central North Pacific experienced increased vertical mixing, with a deepening of the wind-stirred surface layer into nutrient-rich lower waters and probable increased injection of nutrients into the upper ocean. Resulting increased primary productivity likely provided a larger food base for fish and animals at higher trophic levels. In the NWHI changes of 60 to 100 percent over baseline levels in productivity for lobsters, seabirds, reef fish and Hawaiian monk seals were observed and attributed to deeper mixing during 1977-1988 (Polovina et al. 1994). The variation in the geographical position of this vertical mixing is in turn related to the position of the Aleutian low-pressure system.[6] As this system deviates from its long-term average position, productivity may be more or less affected in the waters around the NWHI.

Polovina et al. (1994) suggested that the average position of the Aleutian low-pressure system moved northward in the mid- to late-1980s. Thus, the "declines" in productivity observed at Midway and FFS after 1988 may actually represent returns to more "normal," lower levels of productivity (Mundy undated). Productivity may have been most affected at FFS, the southernmost reproductive colony of Hawaiian monk seals (Craig and Ragan 1999). Furthermore, the adverse impact of a return to less productive oceanographic conditions on Hawaiian monk seal reproduction and survival could presumably have been greater at FFS because that island's Hawaiian monk seal population was closer to carrying capacity (Ragen and Lavigne 1999).

Goodman-Lowe (1998) examined inter-island variation in the diet of mature and juvenile Hawaiian monk seals and concluded that Hawaiian monk seals are opportunistic foragers. The fact that seals at FFS were apparently unable to find sufficient prey during the late 1980s and

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[6]There are also considerable biological data showing higher fish and zooplankton densities in the Gulf of Alaska during the 1970s and 1980s compared to earlier decades, as well as correlations between biological indices and an index of the strength of the Aleutian low-pressure system (Polovina et al. 1995).

early 1990s suggests the occurrence of a phenomenon capable of affecting the seals' entire prey base. For example, changes in the sizes of NWHI populations of reef fish, a known prey of Hawaiian monk seals (Goodman-Lowe 1998), may be linked to the interdecadal changes in ecosystem productivity in the central Pacific (DeMartini and Parrish, 1996). In 1992-1993, there was a general decrease in reef fish abundance observed at Midway Atoll and FFS. In 1995, however, a dramatic increase in recruitment and availability of reef fish was detected at the two sites (DeMartini and Parrish 1996). No further increase in apparent abundance of reef fish since that time has been found (DeMartini and Parrish 1998), but from the mid- to late-1990s there was an improvement in the condition of Hawaiian monk seal pups at weaning and in pup births at FFS and other major island populations. Trends in pup girth measurements indicate that prey resources may have increased during the early 1990s, most notably at Laysan Island, Lisianski Island and FFS (HMSRT 1999). Using recent data from Crittercam deployments, Littnan et al. (2005 pers. comm.) suggest that cryptic benthic fauna (bothids or flounders) inhabiting open sand fields are a target prey item for young monk seals, and that these prey items are likely important for early monk seal survivorship.

Fisheries may also affect the forage base of Hawaiian monk seals. Hawaiian monk seals have the capability to dive to depths at which many species targeted by the bottomfish fishery occur. In addition, Hawaiian monk seals have been reported to remove hooked bottomfish from handlines and consume them (Nitta 1999). Seals appear to prefer *ōpakapaka* but will also steal and eat *onaga*, *butaguchi* and *kāhala*. Monk seals also eat spiny and slipper lobsters, which are targeted in the (inactive) NWHI lobster fishery. However, the results of dietary studies suggest that bottomfish MUS and Crustacean MUS do not constitute a significant component of the natural diet of Hawaiian monk seals (Goodman-Lowe, 1998). In addition, the importance of French Frigate Shoals to the NWHI lobster fishery is minimal, as only 1.2 percent of the total historical effort was conducted at French Frigate Shoals.

Human Interactions: Human interactions with Hawaiian monk seals range from unintentional disturbances at haul-out sites to inflicting intentional injuries on seals, and include a variety of interactions by scientists and resource managers. Human disturbance was probably the principal cause of Hawaiian monk seal population declines before the 1980s. Between 1958 and the mid-1970s, Hawaiian monk seal colonies at the western end of the archipelago between Kure Atoll and Laysan Island declined by at least 60 percent, and the colony at Midway Atoll all but disappeared (Marine Mammal Commission 1999). Most human activity was concentrated at the westernmost atolls of the chain during this period, suggesting that human disturbance contributed to the decline. The Navy undertook a major expansion of its air facility on Midway Atoll during the 1950s, and in 1960 the Coast Guard established a LORAN station at Kure Atoll that was occupied year-round. Ownership of Midway Atoll was transferred from the Navy to the U.S. Fish and Wildlife Service in 1996, and the atoll is now managed as the Midway Atoll National Wildlife Refuge. The Coast Guard closed the LORAN station at Kure Atoll in 1992 and removed most of the manmade structures by 1993.

The human population at Midway Atoll has decreased substantially in the last two decades, but year-round human habitation of the atoll has continued. From 1996 until 2001, there was limited eco-tourism and public use within the Midway Atoll National Wildlife Refuge in the form of charter boat and shore fishing, diving and wildlife observation. A privately-owned business was awarded a concession to develop and manage the tourist facilities in the refuge. The number of visitors allowed on the atoll at any one time was limited to reduce impacts to wildlife. A dispute between the contractor and the USFWS has suspended the visitor program. Nevertheless, the HMSRT (1999) indicated that it supports the efforts of the USFWS to provide compatible visitor opportunities and educational programs at the refuge. It is also important to note that the Midway Atoll Hawaiian monk seal population has increased since the atoll was transferred to the USFWS.

As Hawaiian monk seal haul-outs increase in the MHI, human interactions are becoming more frequent (Ragen 1999). Hawaiian monk seals hauled-out on beaches are viewed by tourists and residents who are often unfamiliar with the take prohibitions and/or the normal behavior of Hawaiian monk seals. NMFS receives at least two reports per week of “stranded” Hawaiian monk seals. Some people attempt to haze the animal back into the water. Most often, the animal reported is exhibiting normal haul-out behavior. Another common harassment is people approaching too closely to take photographs of the seal on land or in the water. One female Hawaiian monk seal was intentionally harassed when a resident threw coconuts at it (Henderson pers. comm. 2001). On Kauai, a Hawaiian monk seal was bitten by a pet dog (Honda pers. comm. 2001). In 2004, a tourist was bit after he got too close to a pupping female monk seal. Disturbance to Hawaiian monk seals may result in modified behavior making them unpredictable, more susceptible to predators when forced to enter the water or causing an unnecessary expenditure of energy required for thermal homeostasis or catching prey.

Hawaiian monk seal research activities have also inadvertently resulted in some seal mortality. Since 1982, Hawaiian monk seals have been removed from the wild or translocated between locations by the Marine Mammal Research Program (MMRP) of the NMFS-HL as part of research and management to facilitate recovery of the species.

Pups which wean prematurely from their mothers may be in poor condition, and are known to have a minimal probability of surviving their first year. Some of these animals, as well as emaciated juvenile Hawaiian monk seals, have been collected for rehabilitation and release back into the wild. A total of 104 seals (mostly females) have been so taken: 68 were successfully rehabilitated and released into the wild, 22 died during rehabilitation, and 14 were judged to be unsuitable for release and were placed into public aquaria and oceanaria for research. Of the 68 Hawaiian monk seals which were rehabilitated and released from 1984 through 1993, 19 were alive as of 1999. Some of the surviving 19, most of which are located at Kure Atoll, are pupping. However, the precise number of pups born to these released Hawaiian monk seals is unknown (NMFS unpub. data, 2001; Johanos and Baker 2001).

Of the remaining 49 Hawaiian monk seals that were rehabilitated and released, the following information has been gathered: 5 were found dead within one year of release, 29 disappeared within one year of release, and 15 disappeared from 2-11 years after release.

Adult male Hawaiian monk seals have been documented to injure and kill other Hawaiian monk seals, including adult females, immature Hawaiian monk seals of either sex, and weaned pups. Some of the attacks have been made by groups of adult males, while others were by individual males. To reduce injuries and mortalities, NMFS has removed aggressive adult males from some sites. A total of 40 adult male seals have been taken. Thirty-two were translocated to locations distant from the site where the attacks had occurred (21 were moved to the MHI in 1994 and 11 were moved to Johnston Atoll, 9 in 1984 and 2 in 1998). Five were placed into permanent captivity. Two died while being held in temporary pens for translocation. One was euthanized. Although there is no systematic sighting effort for the 21 adult males translocated to the MHI, one sighting was made on Kauai in April, 2001.[7] None of the adult Hawaiian monk seals translocated to Johnston Atoll have been resighted since the year in which they were translocated.

Hawaiian monk seals have been moved between populations for reasons other than mitigation of adult male attacks. A total of ten seals have been so taken; five healthy female weaned pups were translocated from FFS to Kure Atoll in an effort to bolster the population and increase the reproductive potential at Kure, and four healthy seals born in the MHI were translocated, after having weaned, to areas less utilized by humans to minimize the potential of human harassment.

Of the five Hawaiian monk seals translocated from FFS to Kure Atoll in 1990, two were known to be alive at Kure as of 1999. Of the four Hawaiian monk seals relocated from sites in the MHI, one was observed alive at Kure Atoll in 1999, two were observed alive on Kauai in 2000, and one that was translocated to Niihau was reported to have been killed sometime after 1994 by a boat propeller, although this report is unconfirmed (Henderson, pers. comm., 2001).

In addition to using unsuccessfully rehabilitated Hawaiian monk seals or aggressive males as captive research animals, some Hawaiian monk seals have been collected from the wild and placed directly into captivity. From 1983 to 1991 a total of four animals were taken; two Hawaiian monk seals were collected from the NWHI, and two Hawaiian monk seals found badly injured in the MHI were treated and placed into permanent captivity (NMFS unpub. data 2001).

In 1995, twelve Hawaiian monk seal pups were taken into captivity by NMFS for the purposes of rehabilitation and eventual return to the wild population. At the time of capture, some of the pups exhibited clinical signs associated with conjunctivitis, red eyes, blepharism, blepharospasm, and photosensitivity. Of the twelve Hawaiian monk seals pups, nine later developed corneal opacities and subsequent cataracts, and one developed cataracts (with no corneal opacities), and two of these total of ten Hawaiian monk seals later died (due to causes unrelated to blindness) (NMFS unpub. data). The remaining 10 Hawaiian monk seals (eight blind and two sighted) were transferred to Sea World of Texas where they are research animals.

The MMRP handles Hawaiian monk seals in the wild as part NMFS' research to monitor the population and facilitate recovery. Takes have included tagging, instrumentation, and sampling for health assessment. The MMRP has handled seals 3,343 times as part of its research activities since 1981. Three seals died during research handling. All three individuals were adult males.

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[7]Salt Pond County Beach Park, Kauai. A Hawaiian monk seal with a red tag # 4A0 was reported acting aggressively toward another Hawaiian monk seal (Freeman pers. comm. 2001). That tag number was confirmed by NMFS to be the tag number of an adult Hawaiian monk seal relocated from Laysan in 1994 (Henderson pers. comm. 2001).

Results of necropsies on these seals varied, but in general all three were older seals whose health had been compromised by chronic illness.

Some researchers have expressed concern that continuous human habitation of research field camps in the NWHI could have an adverse effect on Hawaiian monk seals if not carefully controlled (Spalding 2000). Currently, all Hawaiian monk seal research is monitored and regulated under several federal permit systems. A recent assessment of the possible impact of field research activities on Hawaiian monk seals evaluated 4,800 seals handled between 1982 and 1999 and found no significant deleterious effects on the seals' health or behavior (Baker and Johanos 2000).

There is no recent evidence of intentional injuries from acts such as clubbing or shooting of Hawaiian monk seals in the NWHI. The MMRP annually monitors all major breeding populations of Hawaiian monk seals, and collects data on any injuries or other events which could affect the survival of individual seals. The program has not documented any injuries or mortalities in the NWHI that could be attributed to clubbing, shooting, or other intentional wounding of Hawaiian monk seals since the establishment of the Protected Species Zone in 1991 by Amendment 3 to the Pelagics FMP (Johanos and Ragen, 1996a, 1996b, 1997, 1999a, 1999b; Johanos and Baker 2000). Although a Court Order found that intentional acts to Hawaiian monk seals had occurred in the NWHI, ongoing NMFS' monitoring of Hawaiian monk seal populations indicates that intentional acts in the NWHI have not occurred since the late 1980s.

Tern Island Sea Wall Entrapment: Hawaiian monk seals at Tern Island, FFS, have been entrapped behind a deteriorating sea wall. During World War II, the Navy enlarged Tern Island, one of several small islets at FFS, from its original 4.5 hectares (11 acres) to about 16.2 hectares (40 acres) to accommodate a landing strip (Marine Mammal Commission 1999). To do so, the Navy constructed a sheet metal bulkhead around most of the island and backfilled behind the structure with dredged spoil and coral rubble from the surrounding lagoon. The Coast Guard took over the island from 1952 to 1979 to operate a LORAN station. Since then, it has been used by the U.S. Fish and Wildlife Service as a field station for the Hawaiian Islands National Wildlife Refuge.

The continued existence of the runway and field station at Tern Island – in fact, the integrity of the entire island – is in doubt because the sheet metal bulkhead, now more than 50 years old, is badly deteriorated (Marine Mammal Commission 1999). If the bulkhead fails, the airstrip would be lost, the field station would have to be abandoned, most of the island would erode away, buried debris would be exposed and create entanglement hazards to wildlife, and erosion pockets behind the rusted-out seawall would become serious entrapment hazards for Hawaiian monk seals and other wildlife.

Since recordkeeping began in 1988, a number of Hawaiian monk seals have been entrapped behind the seawall (Table 15). Most of these Hawaiian monk seals have been redirected to the water by FWS and NMFS personnel. Two subadult male Hawaiian monk seals have died as a result of becoming entrapped behind the sea wall.

Table 15: Incidence of Tern Island Hawaiian Monk Seal Entrapments 1988-2000

#	**YEAR**												
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
E	1	3	1	6	4	2	3	3	0	0	5	4	4
M	1	0	0	1	0	0	0	0	0	0	0	0	0

Notes: E - entrapped; M - mortalities; Source: USFWS 2001

In 1999, the U.S. Fish and Wildlife Service received $1 million as an initial investment for sea wall construction at Tern Island. The total cost of the project is estimated to be about $15 million (Marine Mammal Commission 1999). At the 123rd Council meeting (June 21-24, 2004), the USFWS reported that the project began in March 2004 and is 35 percent complete, and is focused on the most damaged and vulnerable sections. NMFS has conducted an ESA consultation on the project and, together with the FWS, has devised monitoring and other measures designed to avoid any take by harassment or otherwise of Hawaiian monk seals and other protected species during the construction activities. The completed restoration of the sea wall is expected to eliminate any future entrapment hazards to Hawaiian monk seals and turtles (USFWS 2001).

Contaminants: Contaminants in the marine and terrestrial environment also pose a potential but unknown risk to monk seal recovery and survival. Effects on monk seals are unknown at this time. The analysis of tissue samples from monk seals at FFS indicate that PCB levels and specific forms (congeners) known to be toxic were found to be lower than PCB levels in other pinnipeds, and the values at FFS are below similar samples obtained from monk seals at Midway Islands (NMFS unpub. Preliminary data, 1999). The significance of these levels to monk seals health is unknown at this time. However, the ecological effects of contaminant clean-up operations at Tern Island (FFS), Johnston Atoll, and Midway Island may have short-term adverse effects on the surrounding corals, fish and invertebrates if an exposure event were to occur. Reductions in prey abundance due to clean-up efforts could reduce foraging success and survival rates of monk seals near these areas.

Fisheries: Several fisheries operate or have operated in the areas utilized by the Hawaiian monk seal. Some of the fisheries are federally managed. These are: the bottomfish fishery, the pelagic longline fishery (transit only), the crustacean fishery (currently suspended), and the deep water precious corals fishery (no participants currently). Other fisheries that operate in areas utilized by the Hawaiian monk seal include fisheries managed by the State of Hawaii. These fisheries include the state-managed MHI bottomfish fishery, commercial and recreational nearshore fisheries (including gillnet fisheries), recreational *ulua* fishery, coastal *opelu* and *akule* fisheries, and collection for the aquarium trade.

The Hawaii-based pelagic longline fishery targets pelagic species of tunas and swordfish. Under the Fishery Management Plan for the Pelagic Fisheries in the Western Pacific Region (Pelagics FMP), NMFS permits up to 164 vessels, but only about 100 vessels have been active during the past two years.

There was some evidence in the early 1990s that longline operations were adversely affecting the Hawaiian monk seals, as indicated by the sighting of a few animals with hooks and other non-natural injuries. Amendment 2 to the Pelagics FMP required longline permit holders to notify NMFS if intending to fish within 50 miles of any NWHI and required all vessel operators to attend a training session. These measures were later deemed insufficient. In 1991, Amendment 3 established a permanent 50-mile Protected Species Zone around the NWHI that closed the area to longline fishing. Establishment of this zone appears to have eliminated Hawaiian monk seal interactions with the longline fleet. Since 1993, no interactions with Hawaiian monk seals in the pelagic longline fishery have been reported. Longline observers recorded only one sighting of a Hawaiian monk seal during transit through the Protected Species Zone near Nihoa Island in 1995 (NMFS unpubl. data).

The NWHI lobster fishery began in the 1970s and annual landings peaked at 1.92 million lobsters in 1985. Since then, landings have decreased. The number of vessels participating in the lobster fishery has ranged from 0 to 17 (A. Katekaru pers. comm. 2001. NMFS-PIRO).

Historically, effort has been concentrated near the islands and atolls of the NWHI where Hawaiian monk seals occur, however FFS, the area with the most observed monk seals represented only 1.2 percent of the total effort of the lobster fishery (Table 22). Observer reports[9] show no Hawaiian monk seal entanglements or other interactions. However, in 1986 near Necker Island, one Hawaiian monk seal died as a result of entanglement with a bridle rope from a lobster trap. In 1983 a precautionary measure was taken to redesign the entrance cone to ensure that Hawaiian monk seals could not get caught in lobster trap entrances.[10]

Lobster is a known prey item of the Hawaiian monk seal, but the importance of lobster in their diet has not been quantified. Ongoing foraging and prey identification studies will help understand the effect, if any, of the lobster fishery on Hawaiian monk seal populations in the NWHI. It has been theorized that octopus are an important monk seals prey item and that the lobster fishery has depleted NWHI octopus populations. Recent studies by NOAA regarding this issue have found that only 83 individuals were captured during the entire 1986-2003 study period and examination of the data shows no significant decline or increase in octopus abundance over time. Based on the data, the study found that it is unlikely that lobster trapping activities have lowered octopus abundance to such a degree that monk seal populations would be negatively impacted (Dinardo 2005, Moffit 2005).

The lobster fishery was closed in 1993 based on the harvest quota set for the fishery under Amendment 7 of the Crustaceans FMP. The fishery re-opened in 1994 with five vessels participating in the fishery. In 1995 the fishery was again closed; however, one vessel was allowed to fish under an experimental fishing permit issued by NMFS to obtain scientific

[9]The lobster fishery was "observed" on a voluntary basis starting in 1997. NMFS scientific data collectors were dispatched on each of the lobster trips during 1997 through 1999. The lobster fishery has been essentially closed since 2000.

[10]Plastic dome-shaped single-chambered traps with two entrance funnels or cones located on opposite ends are employed in the lobster fishery. All traps are required to have escape vents (for smaller lobster). The traps are usually set in strings of about one hundred, with several strings fished at a time.

information on the lobster stock. From 1996 through 1999 the fishery had five, nine, five, and six vessels participating, respectively. Although the lobster fishery was not overfished, NMFS closed the fishery in 2000 through 2001 because of an increased level of uncertainty in the model assumptions used to estimate the lobster harvests (65 FR 39314). Harvest guidelines for the 2001 through 2005 fisheries were not issued by NMFS, in 2006 a zero harvest guideline was issued.

Precious corals are managed under the Precious Corals FMP. NMFS has determined that allowable harvests would not adversely affect the Hawaiian monk seal (NMFS 2000). The contribution of coral beds to prey aggregation and prey availability for Hawaiian monk seals remains unclear. As discussed previously, Hawaiian monk seal diet studies indicate that Hawaiian monk seals are opportunistic and feed on a wide variety of prey (Goodman-Lowe 1998). Research from Parrish et al. (2000) and Abernathy and Siniff (1998) indicate that some seals forage at depths where precious coral beds occur. However, the absence of deep diving activity at Pearl and Hermes Reef suggests that Hawaiian monk seals at French Frigate Shoals may vary their foraging behavior depending on the availability of prey resources.

Until recently, a U.S. Fish and Wildlife Service concessionaire operated an ecotourism station at Midway Island. Recreational fishing was allowed in the lagoon and waters around the island. No adverse interactions (e.g., entanglements or hookings) with Hawaiian monk seals in this recreational fishery have been reported. However, a study conducted in 1998 recorded Hawaiian monk seal interactions at six locations during fishing activities (Bonnet and Gilmartin 1998). Inquisitive, newly weaned pups sometimes approach fishing activities, presumably to investigate human activity (Shallenberger pers. comm. 2001. FWS). However, three Hawaiian monk seals were reported to have been hooked as a result of recreational fishing during the operation of the U.S. Coast Guard station at Kure Atoll, which closed in 1993 (Forney et al. 2000).

The fisheries for big game (*ulua*) and small game (*papio* and other smaller fish) are two of the largest components of the shore-based recreational fisheries in Hawaii. The term *ulua* mainly refers to two species: the white *ulua* (*Caranx ignobilis*) and the black *ulua* (*C. lugubris*). *Ulua* can also be used to refer to any larger *Caranx* (ten or more lbs). The term *papio* can refer to *Caranx ignoblis* and *C. lugubris* under 10 lbs as well as to six to eight other smaller Carangids commonly found in near-shore waters. The two fisheries differ more in the gear used than the target species. Any of the species can be and are taken in both fisheries. The two predominant fishing methods employed are the “slide-bait” and “shore casting” fisheries.

Big game shorefishing, primarily targeting large *ulua* (jacks), usually utilizes slide-baiting techniques. Slide bait rigs have a large hook tied or crimped to a short length of wire or heavy monofilament leader which is in turn tied or crimped to a “slide bait” swivel. The slide-bait fishery almost exclusively employs circle hooks of sizes corresponding to Mustad #14/0 and larger. This leader and hook set up is independent of the wired weight set up. These two independent sets of gear combine to make a whole slide bait rig. The weight is cast out and anchored before the slide bait hook rig is attached to the mainline and allowed to “slide” down and out to its final fishing position. The preferred baits are moray eels, “white eel” or “tohei” (conger eel), and octopus. Live reef fish of all kinds are also among the preferred baits.

The mainline (line on the fishing reel) used in slide baiting varies according to the individual, but is generally heavy line in the 80-100 lb plus test weight. The fishing weights generally have 4-5 inch soft wires extending from the terminal end. These wires are bent into a grapnel shape to snag onto rocks and coral to provide a solid anchoring point from which to suspend the large baits off the bottom and prevent the rig from moving with the current or swell. The limited movement prevents tangling with other rigs. The wires used are malleable enough to be straightened with pressure from the rod. The line connecting the weight to the swivel is of a lesser strength than the mainline and designed to break should the weight become inextricably stuck on the bottom.

Small game fishing uses a rig in which a hook(s) and lead is attached to a swivel and is cast as a single unit. It uses smaller hooks and lighter leaders. The major differences between big game fishing and small game fishing are the kind of rig used, the size of the gear, and the general kinds of areas that are preferred by each. The slide-bait fishery is generally associated with close proximity of deep water (20-100 ft) because the technique depends on gravity or the live bait to take the bait down the mainline to the strike zone. Shorecasting for small game is done anywhere along the shoreline.

The third shore based fishery is locally referred to as “whipping.” Whipping involves standing on the shore, usually a rocky area, and casting and quickly retrieving an artificial lure into breaking waves headed towards shore. The lure usually has treble or double hooks attached. Fishing line in the 20-50 lb test weight range is commonly used in this fishery. Often the leader, the first few feet of line directly attached to the lure, is a thicker line for protection from chafing on the fish’s teeth or the reef and rocks. Whipping is also successfully done from boats.

Ulua are also fished from boats. A variety of gear may be employed; typical are the trolling set-up, with down riggers or trolling planes, and surface plugs or casting jigs. Artificial lures, e.g., plugs and lead-head jigs, are used just outside the breaking surf.

The gear used in these recreational fisheries varies, but the most popular gear composition is a circle hook with a slide bait swivel on a wire leader. There is some overlap with the type of hook used (circle hooks) in the bottomfish fishery although the size of the *ulua* circle hook tends to be larger than that used in the bottomfish fishery. Some of the hooks embedded in Hawaiian monk seals have been identified as gear used in the state *ulua* fishery based on gear, size of hook, and location of the Hawaiian monk seal when discovered, while other hooks have been identified as potential bottomfish fishery hooks. There is only one report of a hooking of a Hawaiian monk seal on bottomfish gear being actively fished.

Marine Debris: Marine debris, particularly derelict fishing nets, poses a serious risk of injury and death to Hawaiian monk seals. The inquisitive nature of seals, particularly pups and juveniles, tends to make them attracted to debris. Subsequent interactions can lead to entanglement and, unless they are able to free themselves quickly, entangled seals risk drowning or death through injuries caused by the entangling gear. Between 1982 (the year NMFS first began to collect information on marine debris entanglement) and 2000 a total of 204 entanglements were documented. In 1999, a record 25 Hawaiian monk seals were reported to have been found entangled in marine debris (HMSRT 1999). Most of the net debris in the NWHI appears to be trawl webbing. Although its origin is unclear, no trawl or gillnet fishing occurs in the NWHI, and it is assumed that virtually all of this debris has been transported by ocean currents from distant fisheries around the rim of the North Pacific Ocean (Marine Mammal Commission 2000).

In 1998, NMFS organized a multi-agency cleanup effort to remove derelict fishing nets and other debris from the reefs surrounding FFS and Pearl and Hermes Reef. NMFS was able to remove only a small proportion of this debris and estimated that 38,000 pieces of netting remained in the waters surrounding each of these locations (Marine Mammal Commission 2000). In 1999 the NMFS-HL led a multi-agency effort to survey and remove derelict fishing gear from Lisianski Island and Pearl and Hermes Atoll (Donohue et al. 2001). Reef debris density ranged from 3.4 to 62.2 items/km^2. Fourteen tons of debris was removed from these two islands. The 2000 data include the first examination of marine debris at Kure Atoll, as well as estimations of accumulation rates at Lisianski Island and Pearl and Hermes Atoll. These three locations were resurveyed in 2001 allowing refinement of accumulation rate estimates. Additionally, in 2001 a fleet of three chartered vessels again worked to clean the reefs around Kure Atoll and Pearl and Hermes Atoll. About 62 tons of debris was removed from the two sites, with Kure essentially cleaned of derelict fishing gear during this effort (Laurs 2002). These efforts continued in 2002 and 2003, and are underway in the summer of 2004. To date, five sites have been surveyed: FFS, Lisianski Island, Pearl and Hermes, Kure and Midway Atolls. Approximately 330 tons of marine debris has been removed from NWHI reefs during these surveys. Net samples collected from the NWHI between 1998 and 2002 were about 86 percent trawl/seine nets. These types of fisheries do not exist in Hawaii, and it is presumed that this debris originates in various fisheries in the northern Pacific. Gillnet made up about 8 percent of the total. Longline gear comprised about 1.4 percent.

Information on marine debris entanglement and injuries, including mortalities, has been collected by NMFS since 1982 Seven categories of debris have been defined: nets (of fishery origin), lines or ropes (not necessarily of fishery origin), net/line combinations (of fishery origin), cones (from hagfish traps), rings (circular items of unknown origin), plastic packing straps (of fishery and non-fishery origin), and other /unknown. A total of 204 entanglements was documented, 96 by fishery items (5.05 per year), 96 by non-fishery items (5.05 per year), and 12 by unknown items (0.64 per year). From the total number of entanglements, 47 serious injuries were documented, including 27 by fishery items (1.42 per year), 8 by non-fishery items (0.42 per year), and 12 by unknown items (0.64 per year). Seven mortalities from entanglement were documented: 6 from fishery items (0.32 per year) and 1 from a non-fishery item (0.05 per year) (Table 16). Five of the seven debris-related mortalities were caused by trawl netting and the other from unidentified line. Trawl fishing does not occur in areas under Council jurisdiction.

Table 16: Known Marine Debris Related Monk Seal Mortalities 1982-2000

YEAR AND LOCATION	DESCRIPTION
1986– FFS	Weaned male tangled in wire which was relic of USCG or Navy occupation; in water
1987–Lisianski Is.	Pup (uncertain if nursing or weaned) dead in net/line aggregate onshore

YEAR AND LOCATION	DESCRIPTION
1987–FFS	Juvenile dead in net/line aggregate onshore
1988–Lisianski Is.	Weaned pup dead in large trawl net onshore
1995–Pearl and Hermes Reef	Bones of adult found scattered in line awash onshore
1997-FFS	Subadult dead in trawl net on reef
1998–Laysan Island	Weaned pup dead in trawl net on nearshore reef
2002 - Lisianski	Nursing pup dead in line: drowned in shallow water

Source: NMFS 2004

Vessels: Hawaiian monk seals may be injured by collisions with vessels or indirectly by vessel groundings that result in the release of hazardous or toxic chemicals or gear that creates an entanglement hazard. Collisions are much more likely with small high-powered vessels. For example, a pup born at the Pacific Missile Range Facility on Kauai was reported dead in 1999. There was an anonymous and unconfirmed report that the pup may have been hit by a zodiac-type vessel employed in the tourist industry.

In August 1998, Tesoro Hawaii Corporation tanker offloading operations resulted in a spill of about 5,000 gallons of bunker fuel off Barber's Point, leeward Oahu. The waters and shoreline of Kauai were affected, and oiled Hawaiian monk seals were reported in the area. During September 1998, up to five oiled Hawaiian monk seals were observed. One Hawaiian monk seal had its entire oral mucosa coated with red, blood-like fluid. This Hawaiian monk seal was later resighted and exhibited signs of a respiratory infection. Another Hawaiian monk seal exhibited "gagging behavior." As there were no physical exams conducted on the animals observed, the wildlife resource agencies could not reach a conclusion about the effects of the oil on the Hawaiian monk seals (Natural Resources Trustees 2000).

In October 1998, the lobster fishing vessel *Paradise Queen II* ran aground near Kure Atoll. Nearly 4,000 gallons of diesel fuel was estimated to be released into the nearshore environment as well as hundreds of lobster traps. No monk seals were reported to be impacted from the vessel grounding.

In April 1999, a longline vessel (*F/V Van Loi*) grounded on a reef off of Kapa'a, Kaua'i. The vessel had 6,000 gallons of diesel fuel on board and was carrying three tons of bait and gear. All fuel, bait and gear (including monofilament line and hooks) went overboard into the marine environment. Monk seals and sea turtles were observed in the area, but no adverse interaction with fuel or gear was reported by wildlife resource managers on scene.

Other Pinniped: The Northern Elephant Seal

Although uncommon in the action area of the bottomfish fishery, the northern elephant seal (*Mirounga angustirostris*) has been observed in the MHI and the NWHI. In 2002 a yearling appeared on the island of Hawaii, was captured, and transported to the Marine Mammal Center in California for rehabilitation and reintroduction to the wild.

2.2.7.2 Sea Turtles

All sea turtles are designated as either threatened or endangered under the Endangered Species Act. The five species of sea turtles known to be present in the Hawaii EEZ are: the leatherback (*Dermochelys coriacea*), the olive ridley (*Lepidochelys olivacea*), the hawksbill *(Eretmochelys imbricata*), the loggerhead (*Caretta caretta*), and the green turtle (*Chelonia mydas*). However, only the hawksbill and green sea turtles have been observed in Hawaii's nearshore areas.

Leatherbacks have the most extensive range of any living reptile and have been reported circumglobally from latitudes 71°N to 42°S in the Pacific and in all other major oceans. The diet of the leatherback turtle generally consists of cnidarians (i.e., medusae and siphonophores) in the pelagic environment. They lead a completely pelagic existence, foraging widely in temperate waters except during the nesting season, when gravid females return to beaches to lay eggs. Typically, leatherbacks are found in convergence zones and upwelling areas in the open ocean, along continental margins, and in archipelagic waters.
The loggerhead turtle is a cosmopolitan species found in temperate and subtropical waters and inhabiting continental shelves, bays, estuaries and lagoons. Major nesting grounds are generally located in warm temperate and subtropical regions, generally north of 25°N or south of 25°S latitude in the Pacific Ocean. For their first several years of life, loggerheads forage in open ocean pelagic habitats. Both juvenile and subadult loggerheads feed on pelagic crustaceans, mollusks, fish and algae. As they age, loggerheads begin to move into shallower waters, where, as adults, they forage over a variety of benthic hard and soft bottom habitats.

The olive ridley is one of the smallest living sea turtles (carapace length usually between 60 and 70 cm) and is regarded as the most abundant sea turtle in the world. Since the directed take of sea turtles was stopped in the early 1990s, the nesting populations in Mexico seem to be recovering, with females nesting in record numbers in recent years. The olive ridley turtle is omnivorous and identified prey include a variety of benthic and pelagic items such as shrimp, jellyfish, crabs, snails and fish, as well as algae and sea grass.

The hawksbill turtle is listed as endangered under the ESA. Anecdotal reports throughout the Pacific indicate that the current population is well below historical levels. In the Pacific, this species is rapidly approaching extinction primarily due to the harvesting of the species for its meat, eggs, and shell, as well as the destruction of nesting habitat by human occupation and disruption (NMFS 2001).

Like other sea turtles, hawksbills will make long migrations between foraging and nesting areas (Meylan 1999), but otherwise remain within coastal reef habitats. Hawksbill turtles occur in the water around the Hawaiian Islands (on Oahu, Molokai, Maui and Hawaii) and nest on Maui and the southeast coast of the Island of Hawaii.

Green turtles were listed as threatened under the ESA on July 28, 1978, except for breeding populations found in Florida and the Pacific coast of Mexico, which were listed as endangered.

Using a precautionary approach, Seminoff (2004) estimates that the number of nesting female green turtles has declined by 48 to 67 percent over the last three generations (~ 150 yrs). Causes for this decline include harvest of eggs, subadults and adults; incidental capture by fisheries; loss of habitat; and disease. The degree of population change is not consistent among all index nesting beaches or among all regions. Despite an overall declining trend globally, green turtle population growth rates are variable among nesting populations and regions and some populations are stable or increasing in abundance (Chaloupka et al. in press).

Green turtles in Hawaii are considered genetically distinct and geographically isolated although a nesting population at Islas Revillagigedos in Mexico appears to share the mtDNA haplotype that commonly occurs in Hawaii. In Hawaii, green turtles nest on six small sand islands at French Frigate Shoals, a crescent-shaped atoll situated in the middle of the Hawaiian Archipelago (Northwestern Hawaiian Islands) (Balazs 1995). Ninety to 95 percent of the nesting and breeding activity occurs at the French Frigate Shoals, and at least 50 percent of that nesting takes place on East Island, a 12-acre island. Long-term monitoring of the population shows that there is strong island fidelity within the regional rookery. Researchers monitoring East Island since 1973 have collected information on numbers of females nesting annually and have conducted tagging studies (Balazs 2002).

Since the enactment of the ESA in 1973, and following years of exploitation, the nesting population of Hawaiian green turtles has shown a steady increase (Balazs 1996; Balazs and Chaloupka 2004). The number of nesting females at East Island increased from 67 nesting females in 1973 to 467 nesting females in 2002. Nesting abundance increased rapidly at this rookery during the early 1980s, leveled off during the early 1990s before again increasing rapidly during the late 1990s and up to the present. This trend is very similar to the underlying trend in the recovery of the much larger green turtle population that nests at Tortuguero, Costa Rica (Bjorndal et al. 1999).

The stepwise increase of the long-term nester trend since the mid-1980s is suggestive, but not conclusive, of a density-dependent adjustment process affecting sea turtle abundance at the foraging grounds (Bjorndal et al. 2000; Balazs and Chaloupka 2004). Balazs and Chaloupka (2004) conclude that the Hawaiian green sea turtle stock is well on the way to recovery following 25 years of protection. This increase can be attributed to increased female survivorship since harvesting of turtles in the foraging grounds was prohibited in the mid-1970s and cessation of habitat damage at the nesting beaches since the early 1950s (Balazs and Chaloupka 2004). Low level nesting also occurs at Laysan Island, Lisianki Island and on Pearl and Hermes Reef (NMFS and USFWS 1998a).

Important resident areas of green turtles have been identified and are being monitored along the coastlines of Oahu, Molokai, Maui, Lanai, Hawaii, and at nesting areas in the reefs surrounding the French Frigate Shoals, Lisianski Island, and Pearl and Hermes Reef (Balazs 1982; Balazs et al. 1987).

The green turtle population in the Hawaiian Islands area is afflicted with a tumor disease, fibropapillomatosis, which is of an unknown etiology and often fatal, as well as spirochidiasis, both of which are the major causes of stranding of this species. Green turtles captured off

Molokai from 1982-96 showed a massive increase in fibropapillomatosis over this period. Prevalence of fibropapillomatosis peaked at 61 percent occurrence in 1995 (Balazs et al.1998). Preliminary evidence suggests that there is an association between the distribution of fibropapillomatosis in the Hawaiian Islands and the distribution of toxic benthic dinoflagellates (*Prorocentrum* spp.) known to produce a tumor promoter, okadaic acid (Landsberg et al. 1999). Stranding reports from the Hawaiian Islands from 1982-1999 indicate that the green turtle is the most commonly stranded sea turtle (96.5 percent, compared to other species), averaging around 150 per year (2,689 total/18 years). While the disease is often fatal, a recent study found no apparent effect of fibropapillomatosis on Hawaiian green turtle population-specific somatic growth rates (Balazs and Chaloupka 2004b). Despite the occurrence of fibropapillomatosis in the Hawaiian Archipelago green turtle stock, nester abundance continues to increase (Aguirre et al. 1998 in Balazs and Chaloupka 2004) and the stock is well on the way to recovery (Balazs and Chaloupka 2004b).

2.2.7.3 Seabirds

The NWHI are home for around14 million seabirds and provide important nesting habitat for around 5.5 million breeding pairs (USFW 2004). The only ESA-listed seabird found in NWHI is the Short-tailed albatross (*Phoebastria albatrus*), with 1-3 individuals observed to visit Midway each year. Other seabirds found in the NWHI include, but are not limited to the black-footed albatross (*Phoebastria nigripes*), the Laysan albatross (*Phoebastria immutabilis*), the Masked booby (*Sula dactylatra*), brown booby (*Sula leucogaster*), red-footed booby (*Sula sula,*), wedge-tailed shearwater (*Puffinus pacificus*), and the Christmas shearwater (*Puffinus nativitatis*). More than 95 percent of the world's Laysan and black-footed albatross nest in the NWHI. Population trends for most seabird species in the NWHI appear stable or increasing, but nonetheless there is continuing concern for albatross species. Threats to NWHI seabirds include introduced and invasive species, contaminants, marine debris, oil pollution, climate change, and fishery interactions.

Short-tailed Albatross (*Phoebastria albatrus*)

General Description: The short-tailed albatross is the largest seabird in the North Pacific with a wingspan of more than three meters (nine feet). The short-tailed albatross bill is larger than the bills of Laysan and black-footed albatrosses and is characterized by a bright pink color with a light blue tip and defining black line extending around the base. The juvenile plumage is brown, and at this stage, except for the bird's pink bill and feet, the seabird can be easily mistaken for a black-footed albatross. As the juvenile short-tailed albatross matures, the face and underbody become white and the seabird begins to resemble a Laysan albatross. In flight, however, the adult short-tailed albatross is distinguished from the Laysan albatross by a white back and by white patches on the wings. As the short-tailed albatross continues to mature, the white plumage on the crown and nape changes to a golden-yellow.

Distribution: The short-tailed albatross is currently known to breed only in the western North Pacific Ocean, south of the main islands of Japan. Although at one time there may have been more than ten breeding locations (Hasegawa 1979), today there are only two known active breeding colonies, Minami Tori Shima Island ("Torishima") (30º 29́ N., 140º 19́ E.) and Minami-

Kojima Island (25º 56́ N., 123º 42́ E.). A few short-tailed albatross have been observed attempting to breed, although unsuccessfully, at Midway Atoll. Midway lies roughly 1,750 miles east and slightly to the north of Torishima.

Today, the breeding population of the short-tailed albatross is estimated at approximately 326 breeding pairs: 276 pairs on Torishima and 50 pairs on Minami-Kojima. The short-tailed albatross have an annual survival rate of 96 percent and a population growth rate of 7.8 percent (65 FR 46643, July 31, 2000; Hasegawa 1997). Because of the robust growth of the population at Torishima, and the fact that short-tailed albatrosses do not return to the colony until three or four years of age, a large number of these birds are dispersed at sea. At least 25 percent of the reproducing adults also remain at sea during each breeding season (Cochrane and Starfield 1999). As a consequence, the exact number of individuals in the population is difficult to assess and at this time is unknown. The population size has been estimated at about 1,900 individuals (P. Sievert, personal communication: in NMFS 2005), and the Torishima population is estimated to have increased by 9 percent between the 2003-04 and 2004-05 nesting seasons (Harrison 2005).

It is unknown if short-tailed albatrosses historically bred in the NWHI. Visits to the NWHI by short-tailed albatrosses were first recorded on Midway in 1938, when a female was seen incubating an infertile egg (Haden, 1941; Munro, 1944). Sighting and banding records show that between 1938 and 2003, at the most, 22 short-tailed albatrosses visited the NWHI, with only one or two sighted on the same island at any one time. The first time two short-tailed albatrosses were known to be present on Midway at the same time, although located at different locations, occurred in February 1981. No more than four short-tailed albatross have been observed at Midway in one breeding season. Since 1998, however, a female has returned each year has laid four infertile eggs (USFWS 2004).

Black-footed Albatross (*Phoebastria nigripes*)

General Description: The black-footed albatross is characterized by dark plumage, bills, legs, and feet at all stages of their development. Comparatively, the black-footed albatross is slightly larger and heavier than the Laysan albatross, but for same-sex birds there is no significant difference between the two species (Harrison et al., 1983; Whittow, pers. comm.). The plumage coloration for both the immature and adult black-footed albatross is extremely similar; brown with a white band at the base of their bill and a white sweep defining their eyes. One of the distinguishing features between adult and juvenile (i.e., young-of-the-year) black-footed albatross are that the juveniles lack the white plumage at the base of their tail. The plumage of the immature birds can be, but is not always, slightly darker in coloration than the adult birds. Generally, as the juvenile black-footed albatross mature, they tend to become more gray or dusty in appearance (Whittow, 1993a; Miller, 1940).

Distribution: The current world population of breeding black-footed albatross is estimated at approximately 327,753 individuals, with 58,898 breeding pairs in 12 colonies (Flint and Hasegawa, unpub. data). Nine colonies are located in the NWHI comprising the majority of the breeding population (55,775 breeding pairs). Seventy-nine percent of the NWHI breeding pairs nest in three colonies that are routinely surveyed by the FWS: Laysan Island, Midway Atoll, and

French Frigate Shoals. The largest black-footed albatross colony, accounting for approximately 36 percent of the world population, is on Laysan Island. Midway Atoll has the second largest black-footed albatross colony with 32 percent of the world population. French Frigate Shoals only accounts for less than 7 percent of the world population. Three black-footed albatross colonies are also located in the western Pacific (estimated 2,244 breeding pairs) accounting for approximately 4 percent of the world population. On Torishima, six black-footed albatross chicks were successfully reared in 1957, and since then the number of chicks reared has increased to 914 in 1998 (H. Hasegawa, unpub. data). The black-footed albatross populations on Bonin and Senkaku Islands have also modestly increased.

Under the IUCN criteria for identification of threatened species, the conservation status of the black-footed albatross is currently listed as Vulnerable (BirdLife International, 2000; Croxall and Gales, 1998). The Vulnerable status was given because the taxon "is not critically endangered or endangered but is facing a very high risk of extinction in the wild in the near future" (Croxall and Gales, 1988). To obtain the Vulnerable conservation status, the black-footed albatross population must show declines of greater than 20 percent over three generations - 45 years in the case of the black-footed albatross. Since there are not good census data from 45 years ago, the IUCN evaluates the average annual rate of decline over the period of time that data do exist and extrapolates to 45 years.

The USFWS was recently petitioned to list the black footed albatross under the ESA (Earthjustice 2004). However, the USFWS rejected the petition in a letter to Earthjustice, dated December 3, 2004, stating that emergency listing was not warranted at this time. The petition painted a dismal picture of the prospects for black-footed albatrosses, arguing that the Pacific population is in decline and that this decline is exacerbated by human threats, particularly pelagic longline fishing. However, Harrison (1990) reports that in the early 1980s, black-footed albatross populations in the NWHI ranged from 36,240 to 49,410 nesting pairs, or taking the average, about 43,000 pairs. The most recent nesting population estimate for the NWHI is about 55,775 nesting pairs (NMFS 2004). The difference represents an increase of 12,775 nesting pairs or an increase of 30 percent over this time period. Midway's black-footed albatross population has increased to over 20,000 nesting pairs, from a population in the early 1980s of 6,500-7,500 nesters - an increase of 300 percent in less than two decades. Using an even more conservative estimate from the early 1960s of 7,000 pairs (Robbins 1961) indicates a tripling of the black-footed albatross population size over the past 40 years. The 2005 Midway nesting population of black-footed albatrosses was found by the USFWS to include 24,085 nesting pairs, a 10 percent increase from the 2004 count and a 26 percent increase since 2001(TenBruggencate, 2006). Both the black-footed albatross nesting populations at French Frigate Shoals and Laysan Island in 2003 appeared to be at the high end of the population sizes observed in the early 1980s (Harrison 1990). In addition, the overall increase of black-footed albatross nesting pairs in the NWHI increased by 7.2 percent between 2001 and 2003 (USFWS 2004b). Taken together, these observations strongly suggest either an increasing population, or at worst, a stable population.

Laysan Albatross (*Phoebastria immutabilis*)

***General Description*:** Laysan albatross are characterized by white plumage on their head, neck, and chest, and sooty brown plumage on their upper wings, back, and tail. The Laysan albatross underwings have variable patches of dark and white plumage and are distinguished by dark leading edges and wing tips. Laysan albatross have fleshy-pink colored legs and webbed feet, and in flight the feet project beyond the tail. The Laysan albatross eye is gray, and black plumage extends in a thin line behind the eye. There are no distinguishing characteristics between sexes or between adult and immature phases (Whittow, 1993b).

Distribution: It is estimated that before feather hunters reached Marcus Island, the island had a population of one million Laysan albatross (Rice and Kenyon, 1962). Feather hunters also raided Laysan albatross colonies in the NWHI taking at least 300,000 birds from Laysan Island in 1909 (Dill and Bryan, 1912). The latest available information indicates that it is estimated that the Laysan albatross population is 3.4 million individuals, with 623,622 breeding pairs in 15 colonies. Twelve of the colonies are located in the NWHI comprising of the majority of the breeding population (623,495 breeding pairs). The largest Laysan albatross colony (approximately 71 percent of the world population) is on Midway Atoll. A complete direct nest count by the USFWS on Midway Atoll in late 2005 and early 2006 found that the number of nesting pairs of Laysan Albatrosses had increased by 70 percent since 2001 (TenBruggencate, 2006). Laysan Island has the second largest colony representing nearly 22 percent of the world population.

A serious problem for the Laysan albatross population is lead poisoning of chicks from weathering lead-based paint on old buildings on Midway Atoll. Chicks raised in nests close (< 5 meters) to buildings ingest deteriorating paint directly from the buildings or paint chips that have fallen in and around their nests. Blood lead concentrations in chicks near buildings average 440 μg/dL, compared to an average blood lead of 6 μg/dL in chicks nesting more than 100m from buildings. For comparison, the Centers for Disease Control's blood level of concern for children is 10 μg/dL. The chicks near buildings frequently exhibit a condition of peripheral neuropathy called "droopwing." These chicks cannot raise their wings, leading to broken bones and open sores. They die either as a direct result of lead poisoning or from starvation when their parents stop feeding them. It is estimated that chicks suffering significant detrimental effects from lead exposure on Midway's Sand Island could number in the thousands per year (Finkelstein, 2004).

Boobies (Order Pelecaniformes, Family Sulidae)

Three species of boobies breed in the NWHI and forage in the North Pacific: the masked booby *(Sula dactylactra)*, the brown booby *(S. leucogaster)*, and the red-footed booby *(S. sula)*. Currently, the IUCN classifies boobies as “not globally threatened.” Like the albatrosses, the boobies are also long-lived and have a delayed maturity. Unlike the albatrosses, which are primarily surface feeders, the boobies are plunge divers and also tend to take flying fish (*Cypselurus* spp.) just above or at the surface of the water. To date, there have been no reports of lethal interactions between boobies and the Hawai‘i-based longline fishery, but boobies are reported to sit on vessel decks and watch the baited hooks as they are being set or hauled back. NMFS observers report boobies hovering over baited hooks and some birds may actually attempt a dive, however, no boobies have been reported hooked. Although the foraging behavior of boobies may differ from that of the albatrosses, such that they do not interact with longline fishing vessels or gear in the same manner, boobies are present during fishing operations and the potential for fatal interactions does exist.

Masked, brown, and red-footed boobies range throughout the tropical and subtropical waters of the world's oceans. All three booby species breed throughout the NWHI and on rocky remnants offshore of the main Hawaiian Islands. Generally, the boobies that breed in the Hawaiian Archipelago are year-round residents (Harrison, 1990) and forage close to the breeding colonies. Relatively large red-footed booby colonies (>500 breeding pairs; Harrison, 1990) are located on O'ahu, Kaua'i, and Lehua Islands while only a few masked and brown boobies are known to breed on Lehua and Moku Manu Islands (Harrison, 1990).

Adult masked and red-footed boobies tend to remain close to their breeding colonies while the younger and immature birds roam up to 150 km offshore (Nelson, 1978). Masked boobies, in particular, tend to return to land to roost at night. Some red-footed boobies, as well as brown boobies, are known to range as far as Wake Atoll and the Marshall Islands, but the resident masked boobies tend to remain in the Hawaiian Archipelago (Harrison, 1990).
Although boobies breed throughout the Hawaiian Archipelago, apparently only three localities have been routinely monitored by FWS. Harrison (1990) reported breeding pair numbers from surveys of booby colonies completed between 1981 and 1988. From the surveys completed in the 1980s, it was estimated that there were about 14,000 masked boobies, 1,500 brown boobies, and 11,000 red-footed boobies (Harrison, 1990). The population sizes and composition of the three booby species are currently unknown, but are thought to be healthy.

Masked Booby (*Sula dactylatra*)

General Description: Adult masked boobies, also called white boobies, blue-faced boobies, or whistling boobies, are mostly white with dark plumage on their tail and tips of their wings. This booby is distinguished by a dark 'mask' around the eyes and bill. The 'mask' is actually the featherless bluish skin of the bird. There is some variation in the color of the bill and feet, such that the bill varies in color from a deep orange to a pink and the feet are a dark grey to olive green (Nelson, 1978). During the breeding season, the male's bill becomes a brighter yellow than the female's bill (Nelson, 1978). Juvenile masked boobies differ from the adults in that they are predominantly brown with a white underbelly, throat, and neck (Anderson, 1993).

Brown Booby (*Sula leucogaster*)

General Description: The adult brown booby is recognizable by chocolate brown to dark plumage on the head, neck, upper surface of the wings, and tail, with a sharp line across the upper breast defining the white plumage of the lower breast and abdomen. The undersurface of the wing has a distinctive white bar extending out from the white of the body toward the wing tip. In the Pacific, the head and neck plumage can vary with some birds being slightly darker and others, such as those in the eastern Pacific being pale grey to white (Nelson, 1978). The color of the bill, face, and feet also vary with region, sex, and breeding condition (Nelson, 1978). In general, the female bill is a light greenish-yellow with a white or greyish-green tip, whereas, the male bill is greenish-grey with a white tip. The feet vary in color from a pale green to a bluish-green. Juvenile brown boobies are similar to the adults except that the plumage is paler and the undersurface is a pale, dirty grey color.

Red-footed Booby (*Sula sula*)

General Description: In flight, the adult red-footed booby, also known as the white-tailed or Webster's booby, resembles the masked booby, in that the plumage is mostly a brilliant white with black wing tips and a light yellow crown and nape. The diagnostic features for the species are a blue bill, reddish facial skin, and bright red legs and feet (Schreiber *et al.*, 1996). In some regions, there are adult red-footed boobies with ashy-brown plumage, but these birds are rare in the NWHI (Harrison, 1990). The juvenile characteristics differ greatly from the adult, such that the plumage is a pale brown, the bill is a dark brown, the facial skin is purple, and the legs and feet are yellow. About eight months after hatching, the legs and feet will become redder (Nelson, 1978). Overall, it takes about two or three years for the juveniles to mature to the adult form (Woodward, 1972).

Wedge-tailed Shearwater (*Puffinus pacificus*)

The wedge-tailed shearwater is one of the largest of the tropical shearwters with an overall length of 43 cm, and body mass of 390 g (Whittow, 1997). The bird has grayish brown plumage on its back and white on its belly and underparts except for dark edge to the wings and dark undertail coverts. The sexes are indistinguishable and there are a light and a dark morph to this species.
The wedge-tailed shearwater has migratory behaviors. From September to November, large flocks of the species gather offshore before migrating near the Hawaiian Islands (King, 1974). Often during this period there may be rafts of birds with up to 700 individuals. The wedge-tailed shearwater breeds between February and November in the Northern Hemisphere and August and October to May and June in the Southern Hemisphere.

The wedge-tailed shearwater breeds from Kure Island in the NWHI to Maui Island in the main Hawaiian Islands (Ainley et al., 1997). The wedge-tailed shearwater also breeds on other islands spread throughout the Northeast and South Pacific, including Johnston Atoll and Christmas, Bonin, Volcano, Marshall, and Caroline Islands, and the Indian Ocean where it is known to breed as far west as Madagascar (Whittow, 1997).

A female wedge-tailed shearwater lays a single white egg in a burrow at sea level. The bird may use ledges and rock piles on rocky islands such as Necker in the NWHI (Harrison, 1990), or use shell debris or crevices under coral ledges (Gallagher, 1960). Both adults share in the excavation of the burrow, incubation of the egg, and feeding of the young (Shallenberger, 1973; Shallenberger, 1984). First breeding is at four years of age (Floyd and Swanson, 1983), and a wedge-tailed shearwater may live as long as 29 years (E. Flint in Whittow, 1997).

Christmas Shearwater (*Puffinus nativitatis*)

Christmas shearwaters are slender-bodied with a length of 35-38 cm and body mass of 354 g. (Harrison,1983). Their plumage is dark brown with their underparts being lighter than their upperparts. The sexes are indistinguishable.

The Christmas shearwater breeds primarily in the tropical Pacific ranging as far north as the Hawaiian Islands to as far south as Easter Island (Harrison, 1996). The species usually breeds on remote, small, flat and sandy islands under dense vegetation such as naupaka (*Scaevola sericea*). Christmas shearwaters also breed on a steep grass covered slope on Motu Nui (Johnson et al., 1970).

Breeding adults return to the NWHI from early to late February (Naughton, 1982). A breeding pair will occupy a nest site in early to late March (Seto, 2001). The nest is a shallow scrape or depression in the ground, and usually located under vegetation. The female lays a single white egg each breeding season, and both parents share incubation of the egg and feeding of the chick (Seto, 2001). Chicks fledge between September and October on Midway Atoll The oldest record of a banded Christmas shearwater was 17 years on Laysan Island (K. Swift in Seto, 2001).

Oceanographic Factors Influencing Seabird Food Availability

The region of greatest interactions between seabirds and the Hawai‘i-based longline fleet is a latitudinal band from 25º N. to 40º N., from the dateline to about 150º W. longitude (NMFS, unpub. data). This region is often termed the North Pacific Transition Zone and contains a broad, weak, eastward flowing surface current composed of a series of fronts situated between the Subtropical Gyre to the south and the Subarctic Gyre to the north (Roden, 1980; Polovina, in press; Seki *et al*., in prep.). During the winter and spring, westerlies in the northern portion of the Transition Zone and trade winds to the south result in wind-driven transport of surface waters creating fronts as colder, more dense northern water converges with warmer and lighter water from the south (Roden, 1980). North of Hawai‘i, convergent fronts have been observed during winter to persist at about 28º N., 31º N., and 34º N. latitude (Niiler and Reynolds, 1984; Roden, 1980; Seki *et al*., in prep.). These fronts represent sharp boundaries in a variety of physical parameters including temperature, salinity, chlorophyll, and sea surface height (geostrophic flow) (Niiler and Reynolds, 1984; Roden, 1980; Seki *et al*., in prep.).

Biologically, these convergent fronts appear to represent zones of enhanced trophic transfer (Bakun, 1996; Olson *et al*., 1994). The dense, cooler phytoplankton-rich water sinks below the warmer water creating a convergence of phytoplankton (Roden, 1980). Buoyant organisms such as jellyfish, as well as vertically swimming zooplankton, can maintain their vertical position in the weak down-welling, and aggregate in the front to graze on the down-welled phytoplankton (Bakun, 1996; Olson *et al*., 1994). The concentration of these organisms in turn attracts the higher trophic level predators, and ultimately a complete pelagic food web is assembled (Olson *et al*., 1994) and available to foraging fish and seabirds.

Although the oceanographic conditions described above are typical for the region, periodic anomalies dramatically alter these regimes. Events such as the *El Niño*-Southern Oscillation (ENSO) can have widespread and long-lasting impacts, disrupting trophic transfer with far-reaching consequences within the food chain. In addition, poorly understood phenomena such as the Pacific Decadel Oscillation (PDO) are now increasingly believed to play a significant role in oceanographic conditions and resultant variability in the distribution and abundance of pelagic food web assemblages.

Ecological Interactions Affecting Seabirds

A variety of human activities other than fisheries are known to affect seabirds. Marine pollution has long been identified as a source of negative impacts to seabirds and their populations (e.g., Bourne, 1976; Tanabe *et al.*, 1984). Of greatest concern for albatrosses in the North Pacific Ocean is ingestion of marine debris, especially plastics (Day, 1980; Furness, 1983; Morris, 1980; Petit *et al.*, 1981). Plastic ingestion seems to be significant, especially for albatross chicks. Up to 50 percent of the weight of material regurgitated by albatross chicks consists of plastics, and plastics have been found in 97.6 percent of Laysan albatross chicks at Midway Atoll. For reasons not clearly understood, Laysan albatross seem to consume more plastics than black-footed albatross. Although there is not consensus within the scientific community about the population-level impacts of plastics ingestion by albatrosses, the problem seems to be increasing and could escalate to serious levels despite international conventions (e.g., International Convention for the Prevention of Pollution from Ships (MARPOL).

Seabird Foraging Behavior

Given their capability of flying long distances, seabirds have some ability to adapt to temporal and geographic changes in forage availability. During the non-breeding season, most pelagic seabirds have sufficient energetic reserves to travel whatever distances are required to reach areas with adequate forage.

During the breeding season, however, seabirds are tied to terrestrial colonies for pre-breeding behavior, egg-laying, incubation, and protection and care of hatchlings and juveniles. This is often an extended period, and the need for nearby forage food is considerable during much of this stage of the breeding season. It is especially high when hatchlings are young and require frequent provisioning. As chicks grow older and require less frequent feeding, adults tend to forage longer distances and remain away from the colony for longer periods of time. This pattern of feeding close to colonies at times of peak food demand, then gradually extending foraging forays is well-known for albatrosses.

2.2.7.4 Fishery Impacts on Protected Species

Bottomfish fishery

The State of Hawaii deployed observers on commercial NWHI bottomfish fishing vessels in 1981 and 1982. During that time, no interactions with Hawaiian monk seals or other marine mammals were recorded (Nitta 1999). Thus, the loss of catch or interactions with the gear was not considered to be a significant risk to Hawaiian monk seals or cetaceans (all fish loss was attributed to sharks on the observed trips). Also, the low level of commercial bottomfish fishing effort in the NWHI during that period contributed to the conclusion that interactions with protected marine mammals were minimal if any did occur.

From October 1990 through December 1993, NMFS conducted an observer program for the bottomfish fishery in the Protected Species Study Zone of the NWHI. Observer coverage began on a voluntary basis in October 1990, and became mandatory (i.e., vessels were required to carry observers on board as ordered by the Southwest Regional Administrator) in November of that same year due to the proximity of bottomfish fishing operations to Hawaiian monk seal habitat. The NMFS observer program recorded interactions between marine mammals (Hawaiian monk seals and bottlenose dolphins) characterized by removal of fish and bait from fishing lines without hooking or entanglement in the fishing gear (Nitta 1993). Analysis of observer reports indicate a Hawaiian monk seal interaction rate of one event per 67.7 hours of fishing and a bottlenose dolphin interaction rate of one event per 37.7 hours of fishing (Nitta 1993). Some Hawaiian monk seals and bottlenose dolphins seemed to exhibit an apparent familiarity with certain vessels.

There is one known monk seal interaction attributable to the NWHI bottomfish fishery, and that was self-reported by the fisherman. In January, 1995 a fisherman from a commercial bottomfish fishing vessel reported to NMFS biologists that his vessel had hooked a Hawaiian monk seal at "No-Name Bank" in December, 1994. The adult-sized seal was pulled to the boat and the leader was cut, leaving about 12 - 18 inches trailing. According to the fisherman, the seal had taken the catch (probably *uku*), and the hook was lodged in the lower jaw.

Observer coverage of the NWHI bottomfish fishery was reinstituted in the fourth quarter of 2003. Eighteen of 86 vessels (trips) departed with NMFS observers throughout the fourth quarter of 2003 and all of 2004. An additional 13 of 52 trips departed with NMFS observers during 2005. On the 31 observed trips (22 percent of all trips) through the end of 2005, no interactions with marine mammals were observed. Because direct information is scarce, the possible effects of individual monk seals following bottomfish fishing vessels and consuming catch or discards on the monk seal population are difficult to determine. Individual seals could have better growth rates and reproductive success when they rely upon the easy prey of hooked fish. On the other hand, reliance on fishing vessels for food could hinder the growth and reproductive success of individual seals when vessels move out of an area and seals must learn to forage on their own, or if the prey they obtained from the vessels is inadequate for the monk seals dietary needs. In addition, use of the vessels as a food source increases the likelihood that an individual seal will become hooked or entangled in fishing gear (NMFS 2002). For these reasons, NWHI bottomfish fishermen are now voluntarily moving to a new fishing location if their vessel is approached by a monk seal and observers on board vessels during 2003-2005 did not report monk seals feeding on discarded fish.

The 1990-1993 observer data revealed that some Hawaiian monk seals followed fishing vessels from station to station for several days. Some seals seemed to have no fear of the vessels, approaching and remaining close to the vessels for long periods. These Hawaiian monk seals could steal an average of 20 fish per day. Some seals, more wary of vessels, typically did not approach closely nor did they steal fish directly from handlines, but they did sometimes consume discarded fish. Hawaiian monk seals also targeted shark-distracting lines baited with live bait.[1]

[1] Shark distracting lines are usually baited with *kāhala* or discard fish that are often associated with ciguatoxin or ciguatoxin-like conditions (Nitta 1993). However, it is unknown at this time whether Hawaiian monk seals are affected by this or other biotoxins.

The effects of such interactions (Hawaiian monk seals stealing fish) on Hawaiian monk seal populations are unclear but would represent a modification of Hawaiian monk seal feeding behavior. Individual Hawaiian monk seals may habituate to the presence of fishing operations. The report, "Summary Report: Bottomfish Observer Trips in the Northwestern Hawaiian Islands October 1990 to December 1993" states that "(g)iven the artificial availability of these bottomfish species to seals and dolphins as a result of the fishing gear and technique, the proximity of populations of seals and dolphins to the fishing grounds, and the practice of discarding unwanted fish, it is likely that predation of catch by seals and dolphins will continue in the NWHI (Nitta 1993)."

Traveling with the vessel may displace effort on the part of Hawaiian monk seals to locate more permanent foraging locations. Hawaiian monk seals tracked by Abernathy and Siniff (1998) showed site fidelity to foraging locations. Finding suitable foraging locations may be a product of exploration, and may suggest that time spent following vessels that visit the same location intermittently may displace natural foraging habitat exploration and identification. Observations of Hawaiian monk seals, and data from foraging behavior studies indicate that younger Hawaiian monk seals tend to forage nearer to shore, and adults, especially males, will forage at farther locations and deeper depths (Abernathy and Siniff 1998). This may suggest that juveniles are more susceptible than adults to fishery interactions in shallow water.

As discussed above, to reduce interactions resulting from discarded fish, the members of the NWHI bottomfish fishery have agreed to a voluntary retention program in which fishermen shall cease fishing and retain all gear on deck whenever a Hawaiian monk seal is sighted in an area within a 10 yard radius of where fishing operations are ongoing. If the Hawaiian monk seal remains in this designated area for more than two hours, the Master of the vessel shall relocate to other fishing grounds where there are no Hawaiian monk seals. All injured and/or dead bycatch will be retained on board the vessel. Discard of offal shall occur after fishing operations have ceased and only if there are no Hawaiian monk seals in the area. NMFS observers on board vessels during 2003-2005 did not report monk seals feeding on discarded fish.

Accidental hookings of Hawaiian monk seals or other marine mammals in the bottomfish fishery have been reported or observed only rarely (Nitta 1999). As discussed above, no Hawaiian monk seals were observed hooked or entangled in fishing gear during the NMFS observer program for the bottomfish fishery. However monk seals have been found with embedded hooks.

The positive attribution of observed hooks embedded in Hawaiian monk seals to a particular fishery is difficult. For example, similar types of fishing gear are used in the offshore bottomfish fishery and the MHI *ulua* fishery. The MHI *ulua* fishery, managed by the State of Hawaii, is primarily shore-based and comprised mainly of recreational anglers. The circle hooks used in this fishery resemble those used in the offshore bottomfish fishery (both State of Hawaii and Federal components), although the size of the *ulua* circle hooks employed in the recreational fishery tends to be larger. Some of the hooks embedded in Hawaiian monk seals have been positively identified by NMFS as those used during shoreline fishing for *ulua* based on gear type, size of hook and location of the Hawaiian monk seal when discovered, while other hooks have been identified as those used in the offshore bottomfish fishery. However, the origin of many of the hooks found embedded in Hawaiian monk seals is uncertain.

In 1990, there were allegations that some fishermen were intentionally killing or injuring Hawaiian monk seals in order to stop them from stealing fish and bait from hooks (Wagner 1990; NMFS 1991). At that time a number of dead Hawaiian monk seals were observed by NMFS researchers with head injuries of unknown origin. However, there was no evidence that the injuries were inflicted by bottomfish fishermen. The only documented case of an illegal killing of a Hawaiian monk seal occurred when a resident of Kauai killed an adult female in 1989 (NMFS 1998). Since 1990, no additional Hawaiian monk seals have been sighted with injuries suspected of being intentionally inflicted by humans (G. Antonelis pers. comm. 2000). Indeed, there appears to be little incentive for bottomfish fishermen to intentionally harm Hawaiian monk seals during fishing operations, as studies such as that of Kobayashi and Kawamoto (1995) indicate that the incidence rate of bottomfish damaged by Hawaiian monk seals is very low (0.45 per 1,000 fish).

There is little or no information on the indirect effects of the bottomfish fishery on the Hawaiian monk seal through competition for prey or alteration of prey assemblages by removal of key predator fishes, however it is thought that such effects would be minimal. The deep-slope bottomfish fishery in Hawaii concentrates on species of eteline snappers, carangids and a single species of grouper concentrated at depths of 30-150 fm. This depth range is outside the designated critical habitat for the Hawaiian monk seal, which extends out from shore to 20 fathoms in ten areas of the NWHI. In addition, research on the diet of Hawaiian monk seals indicates that the species commonly caught in the bottomfish fishery represent a small fraction of the total number of Hawaiian monk seal prey items. Given the available information, it seems unlikely that the bottomfish fishery is competing directly or indirectly with Hawaiian monk seals for the same fish species.

As described in Chapter 2, contributing factors to the species' status over the past four decades include male aggression and mobbing behavior, shark predation, disease, climatological regime shifts affecting environmental carrying capacity, human interactions (disturbance) including research, sea wall entrapment, contaminants, fisheries, entanglement in marine debris and vessel groundings). At each Hawaiian monk seal breeding subpopulation, differing combinations of these factors likely have contributed to local trends in abundance, with the relative importance of individual factors changing over time.

The species' population trend is determined by the highly-variable dynamics of the six main reproductive subpopulations. Demographic trends over the past decade have been driven primarily by the dynamics of the FFS subpopulation, where an increasingly inverted age structure indicates that recruitment of adult females and pup production may soon decrease. At FFS, the count of animals older than pups is now less than half the count in 1989. Poor survival of pups has resulted in a relative paucity of young seals, so that this population of Hawaiian monk seals is expected to experience further population declines as adults die and there are few juveniles to replace them. Because this subpopulation has the largest number of animals, declines in this subpopulation would cause the species' total abundance to decline (unless other subpopulations experience increases that are large enough to offset decreases at FFS).

Over the last decade, the causes of the poor survival for these age classes at FFS have been related to poor condition from starvation, shark predation, male aggression, habitat loss, and entanglement in marine debris. A decrease in prey availability may be the result of decadal scale fluctuations in productivity or other changes in local carrying capacity for seals at FFS or a combination of factors (Craig and Ragen 1999; Polovina et al. 1994; Polovina and Haight 1999). At this point it is speculative to indicate whether or not fishing effort in these areas has been intense enough to change the forage base.

Therefore, it is anticipated that changes in feeding behavior in response to fishing vessel activity may have had negative consequences for individual seals, but these behavioral changes do not appear to have affected the survival of seal populations. Population survival may be more affected by changes in forage base that are associated with phenomena like decadal shifts in productivity.

Given the expected low rates of hooking and the lack of evidence of competition for fishery resources from the bottomfish fishery, the bottomfish fishery is unlikely to have direct or indirect effects that would appreciably affect individual monk seals or their populations.

If the bottomfish fishery affects sea turtles, the green turtle is most likely the species to be affected because it occurs within the NWHI with more frequency than any other species. The recovery plan for the green turtle (NMFS and FWS 1998) lists the primary threats for Hawaii as disease, nest predation, directed take, fisheries incidental take, and boat collisions. The latter two may be relevant to the bottomfish fishery; however, NMFS and State of Hawaii observer data for the bottomfish fishery (1990-1993 and 2003-2004) contain no reports of these types of direct interactions between any species of sea turtle and the bottomfish fishery (Nitta 1999; PIRO 2005).

Indirect effects on sea turtles could persist from the bottomfish fishery including distraction of hatchlings by fishing vessel lights. However, there is no evidence that effects from vessel lighting on females or hatchlings has or is occurring as a result of fishery operations. It is possible, however, that hatchlings may be adversely affected by fishing activities in the NWHI. It is well documented that shore-based artificial lighting may affect sea turtles by discouraging females from nesting and disorienting hatchlings away from the sea. Therefore, one could construct a scenario wherein vessels operating deck lights at night may attract and concentrate hatchling turtles off shore or disorient females during nesting activities. The effects could expose the hatchling turtles to predators such as sharks, snappers and barracuda and disrupt or prevent females from successful egg deposition.

About 5.6 percent of historical bottomfish fishing effort has taken place in the vicinity of FFS where most of the green turtle egg deposition and hatching takes place. In recent years, a maximum of six bottomfish vessels have fished in the entire Ho'omalu zone. Given this dispersed and low level of fishing activity, continued bottomfish fishing in the NWHI is expected to have no measurable effect on sea turtle adults or hatchlings in the NWHI.

The NMFS observer program for the NWHI bottomfish fishery conducted from October 1990 to December 1993 reported a moderate level of interactions between seabirds and the bottomfish fishery. Interactions were characterized by attempted bait theft. Although there is a possibility of accidental hooking, the circle hooks used in the bottomfish fishery do not lend easily to snagging. No seabird injuries or mortalities were reported while fishermen were fishing for bottomfish. One interaction involving a Laysan albatross occurred while a bottomfish fishing vessel was trolling for pelagic species. The bird became hooked but was subsequently released alive.

The more recent observer data (fourth quarter of 2003 through 2005) show eight interactions with seabirds during 31 observed fishing trips. Seven were hooked or entangled while the vessels were trolling and one was caught during bottomfishing operations. While continued bottomfish fishing may affect a very limited number of individual seabirds, it is expected to have no effect on seabird distribution, survival or population structure. The potential for indirect interaction due to competition for prey is negligible, as seabirds do not prey upon bottomfish or bycatch from this fishery.

On March 8, 2002, NMFS completed a formal consultation under section 7 of the ESA and released a Biological Opinion (BiOp) for the Bottomfish FMP. The BiOp concluded that the bottomfish fisheries of the Western Pacific Region are not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat that has been designated for them.

Crustacean Fishery

An active NWHI lobster fishery could potentially affect monk seals if lobster are an important part of the diet of monk seals. However given that the Crustaceans FMP only allows the harvest of 13 percent of each area's exploitable population (currently set at zero), it appears unlikely that these removals will jeopardize monk seals or their populations. In addition, under the FMP (which must comply with the Endangered Species Act) no harvest guideline will be issued until an ESA consultation is conducted and concludes that a lobster fishery can continue without jeopardizing the continued existence of monk seals.

The most recent BiOp for the Crustaceans FMP was issued by NMFS on May 24, 1996. In 2000 it was found to be "inadequate' by the Hawaii District Court. The NWHI fishery has been essentially closed since that time (NMFS has not issued any harvest guidelines for the fishery) and no new BiOp has been prepared to date.

Precious Corals Fishery

An active NWHI precious corals fishery under current FMP regulations is unlikely to affect monk seals, sea turtles, or seabirds as only selective gear can be used and harvests would continue to be limited by bed quotas, size limits and other measures as described in Chapter 5. Although there has been some information showing that monk seals may use gold coral beds as important foraging habitats, more recent studies have cast doubt on this finding. There is no evidence that sea turtles rely on precious coral beds and interactions with seabirds are highly unlikely as submersible vehicles or SCUBA are used in harvesting operations.

The most recent BiOp for the Precious Corals FMP was issued by NMFS on October 4, 1978. It concluded that, considering the methods utilized for harvesting precious corals (which at that time included non-selective gears that have since been prohibited), the fishery did not constitute a threat to endangered or listed species or their critical habitat. Since that time several informal consultations have reached the same conclusion.

Coral Reef Ecosystems Fishery

Because there are no known interactions between federally managed fisheries for coral reef ecosystem species and protected species, no formal consultations have been deemed necessary for the Coral Reef Ecosystems FMP. An informal consultation was conducted on the implementation of the FMP on March 7, 2002. NMFS concluded that fishing activities conducted under that FMP are not likely to to adversely affected endangered or threatened species or critical habitat under NMFS' jurisdiction. On May 22, 2002, the USFWS concurred with this determination as regards species under its jurisdiction

Pelagics Fishery

Continuation of NWHI pelagic fishing under current FMP regulations is not anticipated to result in adverse impacts to protected species as this is small hook-and-line fishery (e.g. trolling and pelagic handlining) that is not believed to interact with sea turtles or monk seals. Seabird interactions may occur and NMFS has provided pamphlets on avoiding and mitigating such interactions to Hawaii's small boat fishermen. The small scale of this fishery (due in large part to the remote location) means that these interactions are anticipated to remain at low levels for the foreseeable future.

NMFS has conducted a series of formal and informal consultations on the Pelagics FMP. The majority of these have focused on the region's longline fisheries and all have concluded that these fisheries are not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat that has been designated for them. NMFS' February 23, 2004 BiOp included a review and examination of the region's small boat (non-longline) fisheries and came to the same conclusion regarding their activities.

2.3 Description of Hawaii's Fisheries

2.3.1 Bottomfish and Seamount Groundfish Fishery

The deep-slope bottomfish fishery in Hawaii concentrates on species of eteline snappers, carangids and a single species of grouper concentrated at depths of 30-150 fm. The fishery can be divided into two geographical areas (Figure 5): 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. In the MHI approximately 80 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 nm of 100-fathom bottomfish habitat in the Maui-Lānai-

Molokai. For management purposes the NWHI fishery has been separated into the Mau Zone, closer to the MHI, and the Ho'omalu Zone.

In addition to the deep-slope fisheries in the MHI and NWHI, there is a potential seamount groundfish fishery in the Hawaiian Islands. A trawl and bottom longline fishery targeting alfonsin and armorhead at the southeast Hancock Seamount in the NWHI was started by Russian and Japanese fishing vessels in the late 1960s (Okamoto 1982). Large catches were made by foreign fishing vessels for about 10 years until overfishing caused the fishery to collapse. A moratorium on the harvest of alfonsin and armorhead on the Hancock Seamounts has been in effect since 1986 in an effort to rebuild the stocks. The moratorium was reissued by the Council and NMFS in September 2004 and therefore in effect until 2010 (69 FR 51400). Because periodic reviews of the stocks indicate that no recovery has occurred and it is unlikely that the moratorium will be lifted in the near future, the seamount groundfish fishery will not be discussed further.

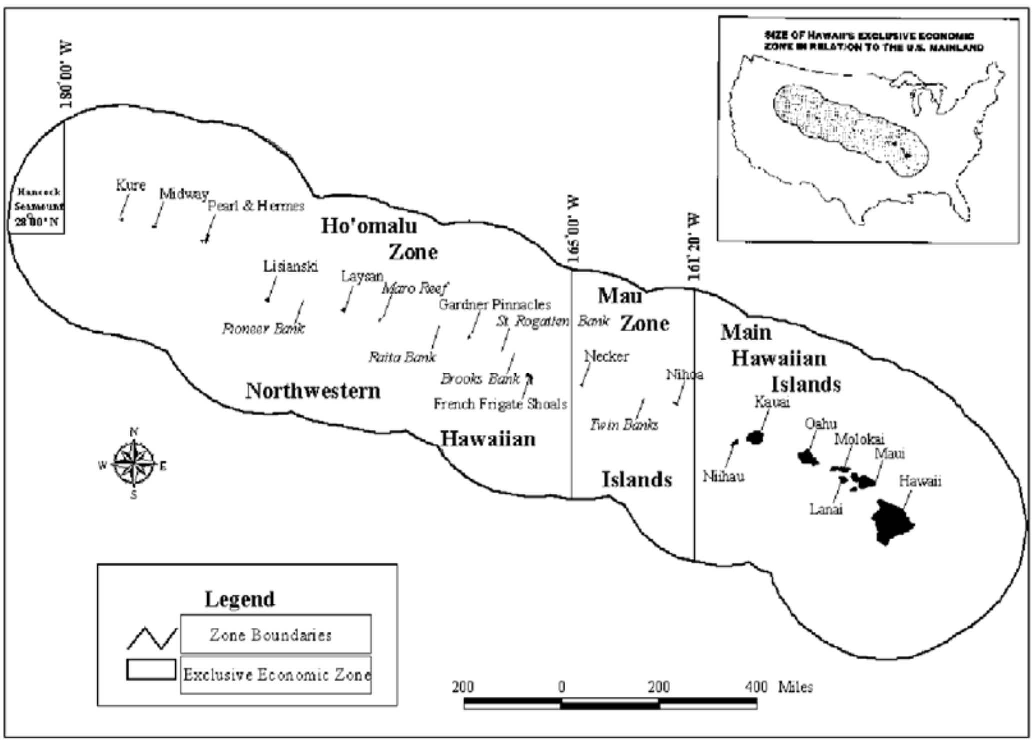

Figure 5: Bottomfish Fishery Management Subareas in the Hawaiian Archipelago

History

Bottomfish fishing was a part of the economy and culture of the indigenous people of Hawai□i long before European explorers first visited the islands. Descriptions of traditional fishing practices indicate that Native Hawaiians harvested the same deep-sea bottomfish species as the modern fishery and used some of the same specialized gear and techniques employed today (Iversen et al. 1990). The *poo lawaia* (expert fishermen) within the community knew of dozens of specific *koa* (fishing areas) where bottomfish could be caught (Kahaulelio 1902). As Beckley (1883:10) noted, each *koa* could be precisely located:

> *Every rocky protuberance from the bottom of the sea for miles out, in the waters surrounding the islands, was well known to the ancient fishermen, and so were the different kinds of rock fish likely to be met with on each separate rock….[They] took their bearing for the purpose of ascertaining the rock which was the habitat of the particular fish they were after, from the positions of the different mountain peaks.*

European colonization of the Hawaiian Islands during the early nineteenth century and the introduction of a cash economy led to the development of a local commercial fishery. As early as 1832, fish and other commodities were sold near the waterfront in Honolulu (Reynolds 1835). Other fish markets were established on the islands of Maui and Hawaii. John Cobb (1902), who investigated Hawaii's commercial fisheries in 1900 for the U.S. Fish Commission, reported that the bottomfish *ulaula*, *uku* and *ulua* were three of the five fish taken commercially on all the Hawaiian Islands.

Initially, the commercial fishing industry in Hawaii was monopolized by Native Hawaiians, who supplied the local market with fish using canoes, nets, traps, spears and other traditional fishing devices (Jordan and Evermann 1902; Cobb 1902). However, the role that Native Hawaiians played in Hawaii's fishing industry gradually diminished during the latter half of the nineteenth century as successive waves of immigrants of various races and nationalities arrived in Hawai□i. Between 1872 and 1900, the non-indigenous population increased from 5,366 to 114,345 (OHA 1998). Kametaro Nishimura, credited by some to be the first Japanese immigrant to engage in commercial fishing in Hawaii, began his fishing career in the islands in 1885 harvesting bottomfish such as *ōpakapaka*, *ulua* and *uku* (Miyaski 1973). By the turn of the century, Japanese immigrants to Hawaii dominated the bottomfish fishery using wooden-hulled "sampans" propelled by sails or oars (Cobb 1902). The sampan was brought to Hawaii by Japanese immigrants during the late nineteenth century, and over time Japanese boat-builders in Hawaii adapted the original design to specific fishing conditions found in Hawaii (Goto et al. 1983). The bottomfish fishing gear and techniques employed by the Japanese immigrants were imitations of those traditionally used by Native Hawaiians, with slight modifications (Konishi 1930).

During the early years of the commercial bottomfish fishery, vessels restricted their effort to areas around the MHI. Cobb (1902) records that some of the best fishing grounds were off the coasts of Molokai and notes that large sampans with crews of four to six men were employed in the fishery. Typically, the fleet would leave Honolulu for the fishing grounds on Monday and return on Friday or Saturday. The fishing range of the sampan fleet increased substantially after the introduction of motor powered vessels in 1905 (Carter 1962). Fishing activity was occurring around the NWHI at least as early as 1913, when one commentator recorded: "Fishing for *ulua* and *kāhala* is most popular, using *bonito* for bait, fishermen seek this [sic] species in a 500 mile range toward Tori-Jima [NWHI]" (Japanese Consulate 1913, as cited in Yamamoto 1970:107). Within a few years more than a dozen sampans were fishing for bottomfish around the NWHI (Anon. 1924; Konishi 1930). Fishing trips to the NWHI typically lasted 15 days or more, and the vessels carried seven to eight tons of ice to preserve their catch (Nakashima 1934). The number of sampans traveling to the more distant islands gradually declined due to the limited shelter the islands offered during rough weather and the difficulty of maintaining the quality of the catch during extended trips (Konishi 1930). However, during the 1930s, at least five bottomfish fishing vessels ranging in size from 65 to 70 ft continued to operate in the waters around the NWHI (Hau 1984). In addition to catching bottomfish, the sampans harvested lobster, reef fish, turtles and other marine animals (Iversen et al. 1990).

During World War II the bottomfish fishery in Hawaii virtually ceased operations, but it recommenced shortly after the war ended (Haight et al. 1993b). The late 1940s saw as many as nine vessels fishing around the NWHI, but by the mid-1950s, vessel losses and depressed fish prices resulting from large catches had reduced the number of fishery participants. During the 1960s, only one or two vessels were operating around the NWHI.

There was renewed interest in harvesting the bottomfish resources of the NWHI in the late-1970s following a collaborative study of the marine resources of the region by state and federal agencies (Haight et al. 1993b). The entry of several modern boats into the NWHI fishery and the resultant expanding supply of high-valued bottomfish such as *ōpakapaka* and *onaga* made possible the expansion of the tourism-linked restaurant market by allowing a regular and consistent supply of relatively fresh fish (Pooley 1993a). Markets for Hawaii bottomfish further expanded after wholesale seafood dealers began sending fish to the U.S. mainland. By 1987, 28 vessels were active in the NWHI bottomfish fishery, although only 12 were fishing for bottomfish full time. Some of the non-full time vessels also engaged in the pelagic or lobster fisheries (Iversen et al. 1990). In 1989, the Council developed regulations that divided the fishing grounds of the NWHI bottomfish fishery into the Ho'omalu Zone and Mau Zone. Limited access programs were established for the Ho'omalu Zone and Mau Zone in 1988 and 1999, respectively, to avoid economic overfishing (Pooley 1993b; WPRFMC 1998b).

The 1970s also saw major changes in the composition and operations of the bottomfish fishery around the main Hawaiian Islands. The fishery changed from one dominated, in terms of catch and effort, by a relatively small number of full-time professional fishermen to one dominated by hundreds of part-time commercial and recreational fishermen. This change was the result of a number of factors. The popularity of offshore fishing increased in Hawaii with the increase in the availability of locally-built and imported small fiberglass boats. In addition, the rise in fuel prices during the 1970s made fishing for bottomfish particularly attractive to fishermen as it consumed less fuel than trolling and generated higher-value fish catches to offset fuel costs. Finally, as navigation systems, bottom-sounders and hydraulic or electric powered reels became more affordable, the skill level and experience necessary to fish bottomfish successfully was reduced and the labor associated with hauling up the long lines was considerably lightened.

During the early 1980s, with the development of a much larger market for bottomfish, bottomfish fishermen fishing around the main Hawaiian Islands were able to obtain premium prices for their catches, and thus were motivated to increase their landings (Pooley 1993a). However, the number of vessels participating in the MHI fishery declined after reaching a peak of 583 in 1985. The decrease in fishing effort suggests that some bottomfish fishermen perceived a growing shortage of bottomfish in the MHI fishery and switched to other fisheries. In 1998, concerns about decreasing catch rates led the State of Hawaii to close certain areas around the

MHI to bottomfish fishing, including areas of Penguin Bank within the EEZ[12]. In addition, new state rules established a recreational bag limit of five *onaga* or *ehu*, or a mix of both, per person.

Hawaii's sportfishing charter boat fleet began to develop during the early 1950s as Hawaii became an increasingly popular tourist destination (Markrich 1994). What started as a few charter boats operating out of harbors such as Kewalo Basin and Kona has evolved into a highly competitive industry involving nearly 200 vessels state-wide (Hamilton 1998; Walker 1996). The charter boat fleet mainly targets pelagic game fish such as billfish and tuna. However, a few charter boats take bottomfish fishing trips if patrons are interested (Hamilton 1998). Most of the charter boats engaged in bottomfish fishing are based on the islands of Maui and Kauai.

Fishing Methods and Current Use Patterns

The basic design of the handline gear used in Hawaii's bottomfish fisheries has remained essentially unchanged from gear used by early Native Hawaiians (Haight et al. 1993b). The gear consists of a main line with a 2-4 kg weight attached to the terminus. Several 40-60 cm sidelines with circle hooks are attached above the weight at 0.5-1 m intervals. A chum bag containing chopped fish or squid may be suspended above the highest of these hooks. The gear is pulled after several fish are hooked.

Circle hooks used in the bottomfish fishery are flat by design. "Kirbed" hooks (bent or offset to the side) are also available but are not generally used. The flat circle hooks are designed to be self-setting and work well for fish that engulf the bait and move off with it in their mouth. As a fish moves off with the baited hook, the line will trail out of the corner of the fish's mouth. The hook will be drawn into the corner of the mouth where the motion of the fish in relation to the pull of the line will rotate the hook through the corner of the jaw. Circle hooks, unlike "J" type hooks, are generally not effective for fish that pick at the bait or mouth the bait and spit it out (Kawamoto pers. comm.).

Fishermen use the circle hook for its self-setting ability and for its curved design with its long inward pointing hook point that makes it difficult for the fish to rid itself of the hook once it is embedded. The circle hook shank is typically thicker and round in cross section (unlike the thinner straight J type hooks), which tends to minimize ripping or wearing a hole in the fish's jaw. An additional characteristic of the circle hook design that appeals to fishermen is that it's less prone to snagging on rocky or hard substrate bottoms and very difficult to snag flat or smooth surfaces. This characteristic minimizes the loss of gear (Kawamoto pers. comm.).

All bottomfish fishermen in Hawai target the same assemblage of bottomfish species. The ability to target particular species varies widely depending on the skill of each captain. Electronic navigation and fish-finding equipment greatly aid fishermen in returning to a particular fishing

[12]The State of Hawaii claims the authority to manage and control the marine, seabed and other resources within "archipelagic waters." These archipelagic waters encompass a number of bottomfish fishing grounds, such as parts of Penguin Bank, that lie inside the EEZ. An October 24, 1997 memorandum from NOAA/General Counsel Southwest Region to the Council Chairman declared that, despite any contentions by the State of Hawaii to the contrary, for purposes of federal fishery management, state waters do not extend beyond three miles from the coast.

spot and catching desired species with little incidental catch (Haight et al. 1993). According to Hau (1984), *ōpakapaka* is one of the primary target species due to the relatively high price it commands as a result of its constant demand at the fish auction. *Hāpuupuu* and white *ulua* are sought because of their sturdiness and ability to retain good flesh quality. In addition, white *ulua* can be caught in rough sea conditions when other species are difficult to capture. *Kāhala* are one of the least valuable bottomfish because large specimens have a reputation for carrying ciguatera toxin.

The number of fishermen engaged in bottomfish fishing in the MHI increased dramatically in the 1970s and 1980s but then declined in the early-1990s, rebounded somewhat in the late 1990s, but in 2003 reached its lowest level since 1977 (Figure 6). The decline in vessels and fishing effort may be due to the long-term decrease in catch rates in the bottomfish fishery and a shift of fishing effort towards tuna and other pelagic species

The majority of participants in the MHI fishery shift from species group to species group and from the bottomfish fishery to other fisheries, primarily the pelagics fishery, in response to seasonal fish abundance or fluctuations in price. Except for those individuals who fish commercially on a full-time basis, most fishermen usually fish for bottomfish no more than 60 days a year (WPRFMC 1998b).

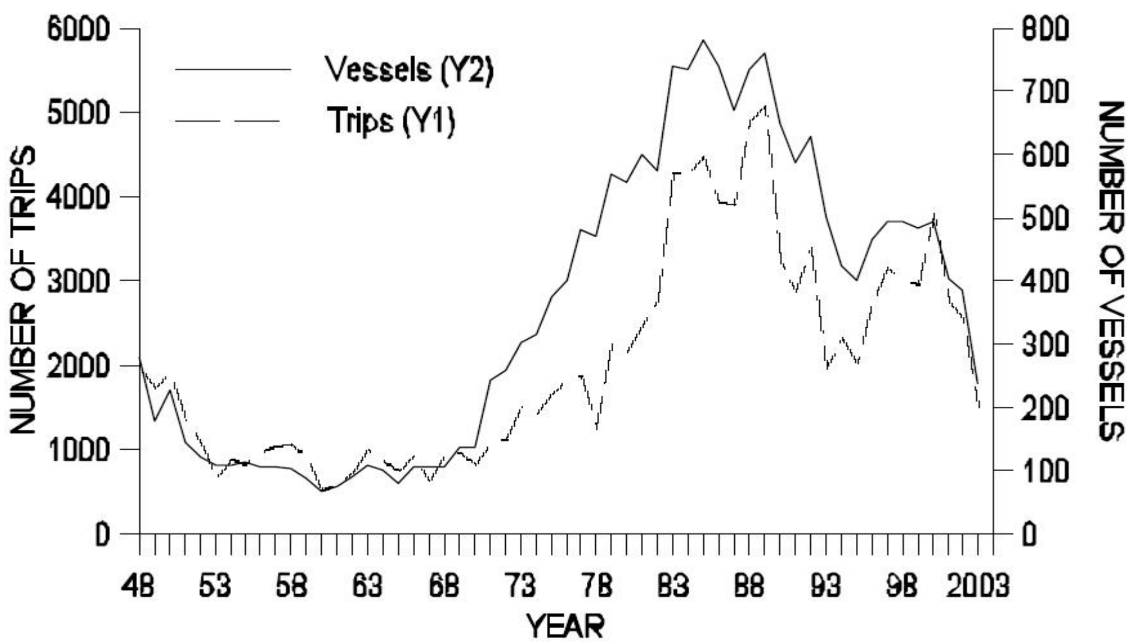

Figure 6: MHI Bottomfish Fishery Participation and Effort
(Source: WPFMC 2004)

Seasonal price variability causes part-time commercial fishermen to concentrate their bottomfish fishing effort during December, when they can take advantage of the year-end holiday demand for red snappers. Pelagic species are often an important secondary target during bottomfish fishing trips regardless of the season.

In contrast to the MHI fishery, bottomfish fishing in the NWHI is conducted solely by part-time and full-time commercial fishermen. The vessels venturing into the NWHI tend to be larger than those fishing around the MHI, as the distance to fishing grounds is greater (Haight et al. 1993b). As the number of vessels participating in the NWHI fishery increased during the 1980s, the fleet characteristics of the fishery became more diverse. Pooley and Kawamoto (1990) divided the fleet into three groups based on size and mode of propulsion: motor sailors, medium-sized powered vessels and large-sized powered vessels. The motor sailors are 46 to 66 ft long and are more streamlined in hull design than the standard powered vessels. The sail can be used to save on fuel costs, but it also limits the hold capacity compared with powered vessels of similar length. The powered vessels generally share one characteristic: a large working area on the back deck. The medium-sized powered vessels are 42 to 49 ft long. Because their smaller size limits fishing range and hold capacity, they usually operate in the lower (southeastern) end of the NWHI (Mau Zone) or in the MHI. The larger powered vessels are 47 to 64 ft long. With an average fuel capacity of 1,500 gallons, the vessels have a maximum range (round-trip) of 1,800 miles. The average maximum hold capacity is 4,000 pounds.

Many of the boats that fish in the Mau Zone switch to different fisheries and move to other fishing grounds during the year. The majority of vessels fish in the Mau Zone during a season that generally extends from November to April. Figure 7 provides the trend in number of bottomfish vessels operating in the NWHI since 1984.

A 1993 survey of participants in the NWHI fishery found that vessels fishing in the Mau Zone made an average of 12.7 trips to the area to target bottomfish and 3.4 trips to target pelagic fish or a mixture of pelagic species and bottomfish (Hamilton 1994). In addition, during that year an average of 5.6 trips were made by these vessels to bottomfish fishing grounds around the MHI. Although bottomfish fishing in the Mau Zone is not the only activity of these boats, it may be vital to the year-round operations of some fishermen.

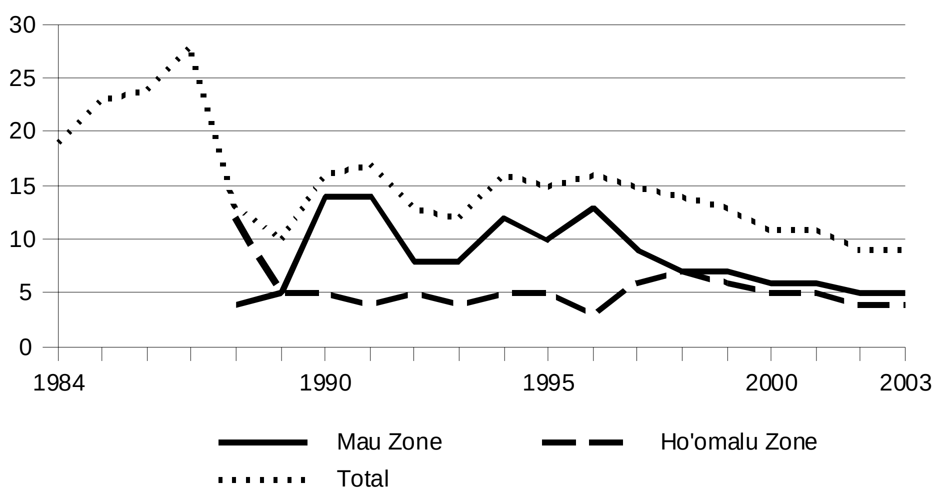

Figure 7: NWHI Bottomfish Fishery Participation (# of vessels)

The fishing strategies and catch levels of vessels fishing in the Ho'omalu Zone tend to be fairly uniform (Pan 1994). The 1993 survey referred to above found that all boats fishing in the Ho'omalu Zone were engaged exclusively in commercial bottomfish fishing (Hamilton 1994). They averaged 9 trips per year to the zone (Figure 8), and the average trip length was about three weeks.

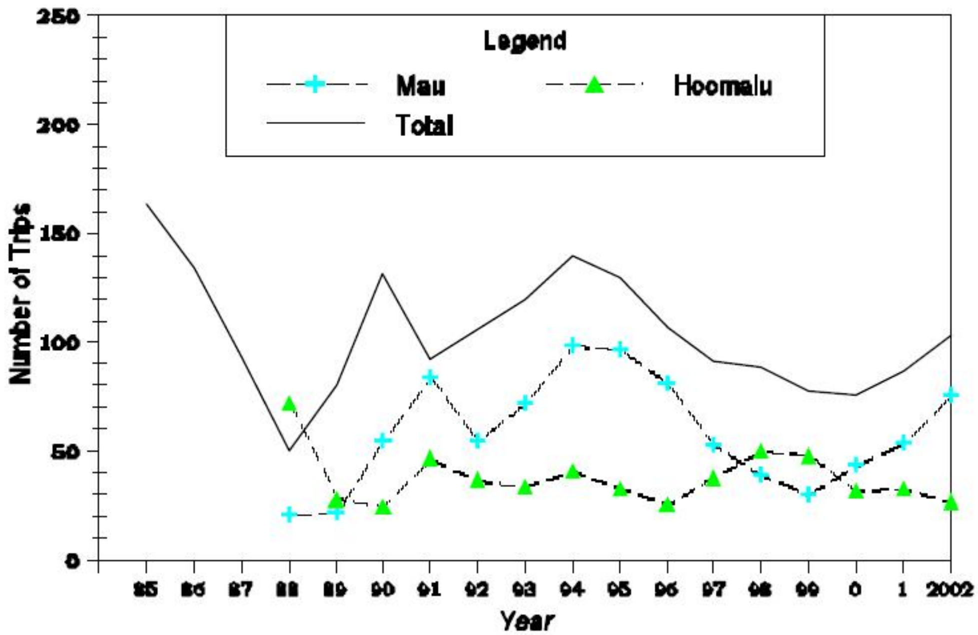

Figure 8: Trend in Number of Trips for NWHI Bottomfish Fishery Permit Holders
(source:WPFMC 2004)

Popular fishing grounds in the Mau Zone include the waters around Nihoa Island and Necker Island (Table 17). Especially productive fishing areas in the Ho'omalu Zone are Brooks Bank, Laysan Island and Gardner Pinnacles.

Table 17: Percentage of NWHI Bottomfish Catch from Selected Areas

AREA	PERCENT OF TOTAL CATCH
Nihoa Island and Twin Banks	16.6
Brooks Bank and St. Rogatien Bank	14.2
Laysan Island	13.6
Necker Island	13
Gardner Pinnacles	12.9
Lisianski Island	6.8
French Frigate Shoals	5.6

AREA	PERCENT OF TOTAL CATCH
Kure Atoll	4.4
Maro Reef	4.2
Pioneer Bank	4
Raita Bank	2.6
Pearl and Hermes Reef	2.1
Midway Atoll	0

Note: Percentages from NMFS landings data for 1997-1999.
Source: M. Mitsuyasu pers. comm. 2000. WPRFMC

Harvest

Only commercial landings data are available for the MHI fishery because the State of Hawaii does not require a saltwater recreational fishing license and there are no state or federal reporting requirements for recreational fishing in the waters around Hawaii. It is estimated that the recreational/subsistence catch in the MHI bottomfish fishery is about equal to the commercial catch (WPRFMC 1999). Charter boat operators are considered to be commercial fishermen under Hawaii statute and therefore are required to submit monthly catch reports. Consequently, charter boat catches are included in estimates of commercial landings.

Based on recent (1998-2003) harvest data, commercial bottomfish catches in the NWHI fishery represent approximately 40 percent of the total commercial bottomfish harvest in Hawaii as shown in Figure 9 (WPRFMC 2004).

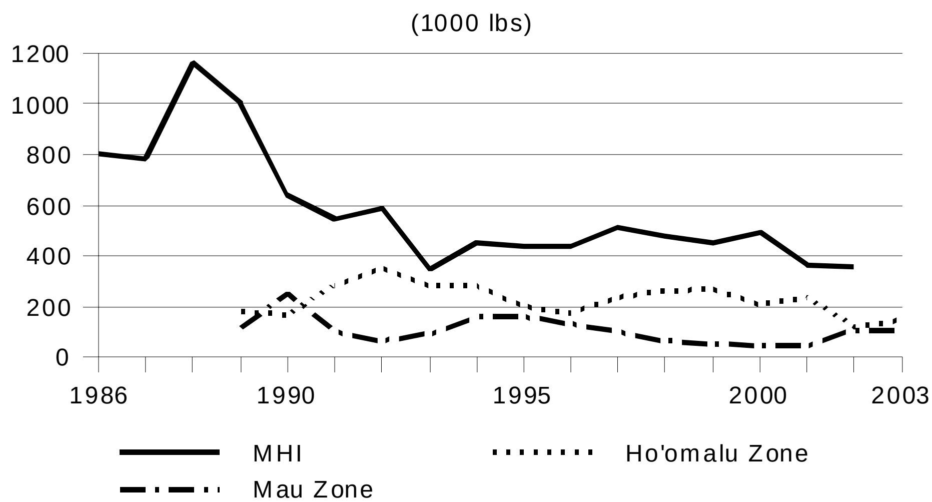

Figure 9: Trends in MHI and NWHI Bottomfish Landings
(Source: WPFMC 2004)

Bottomfish landings from the Mau Zone have increased over recent years to over 100,000 lbs in 2002, and 2003 landings per trip more than doubled as compared to 2001 (Table 18). Trip lengths varied by vessel and trip strategy/target and most of the trips incorporated some trolling activity. The Ho'omalu Zone showed the reverse pattern with 2003 bottomfish landings up 20.8 percent as compared to 2002 but per trip landings down by 20 percent (Table 19).

Table 18: Historical Annual Statistics for Mau Zone Bottomfish Fishery
(Source: WPFMC 2004b)

Year	Total Landings (lbs)	CPUE (lbs/trip)	Inflation Adjusted Revenue	Price per Pound	Number of Vessels
1986	NA	2,206	NA	NA	NA
1987	NA	2,889	NA	NA	NA
1988	NA	2,136	NA	NA	4
1989	118,000	4,463	$443,680	$3.76	5
1990	249,000	3,435	$836,640	$3.36	14
1991	103,000	1,199	$372,860	$3.62	14
1992	71,000	1,273	$248,500	$3.50	8
1993	98,000	1,321	$306,740	$3.13	8
1994	160,000	1,573	$537,600	$3.36	12
1995	166,000	1,635	$509,620	$3.07	10
1996	135,000	1,543	$449,550	$3.33	13
1997	105000	1,976	$384,300	$3.66	9
1998	66,000	1,689	$196,680	$2.98	7
1999	54,000	1,808	$182,520	$3.38	7
2000	49,000	1,053	$173,460	$3.54	6
2001	50,000	916	$144,500	$2.89	6
2002	108,000	1,416	$342,360	$3.17	5
2003	77,000	2,070	$222,530	$2.89	5
Ave.	107,267	1,922	$356,769	$3.31	8
s.d.	53,957	894	$183,346	$0.28	3

Table 19: Historical Annual Statistics for Ho'omalu Zone Bottomfish Fishery
(Source: WPFMC 2004b)

Year	Total Landings (lbs)	CPUE (lbs/trip)	Inflation Adjusted Revenue	Price per Pound	Number of Vessels
1986	NA	5,301	NA	NA	NA
1987	NA	8,187	NA	NA	NA
1988	NA	4,702	NA	NA	12
1989	184,000	5,481	$631,120	$3.43	5
1990	173,000	5,403	$576,090	$3.33	5
1991	283,000	5,871	$914,090	$3.23	4
1992	353,000	9,464	$1,221,380	$3.46	5
1993	287,000	8,412	$984,410	$3.43	4
1994	283,000	6,903	$996,160	$3.52	5
1995	202,000	6,130	$650,440	$3.22	5
1996	176,000	6,216	$621,280	$3.53	3
1997	241,000	6,351	$802,530	$3.33	6
1998	266,000	5,315	$837,900	$3.15	7
1999	269,000	5,611	$989,920	$3.68	6
2000	213,000	5,909	$832,830	$3.91	5
2001	236,000	5,757	$769,360	$3.26	5
2002	120,000	4,638	$433,200	$3.61	4
2003	145,000	3,713	$494,450	$3.41	4
Ave.	228,733	6,076	$783,677	$3.43	5
s.d.	63,033	1,416	$217,036	$0.20	2

Bycatch: The NWHI bottomfish fishery is strictly a commercial fishery in the NWHI, while the MHI bottomfish fishery is a mixed commercial, recreational and subsistence fishery. Although these fisheries use the same gear and operational methods, the motivation of the fishermen is different between the commercial operators and recreational or subsistence fishermen. This results in different bycatch characteristics. The NWHI commercial fishermen seek the highest economic return on their catch and therefore may discard lower valued species, especially early in a trip, thereby conserving both ice and hold space. Recreational or subsistence fishermen, on the other hand, are more inclined to retain a greater variety of species for home consumption or distribution to relatives and friends. For this reason, the bycatch of the NWHI commercial fleet is likely larger than that of the MHI fishery. In addition, because Hawaii has no permit, logbook, or catch reporting system for non-commercial marine fishermen, there are no data on bycatch by this sector. Data on bycatch in the NWHI commercial fishery is available from the logbook program, from limited observer data, and from NMFS research cruises in the NWHI.

Bottomfish gear types and fishing strategies are highly selective for desired species and sizes. Measures that serve to further reduce bycatch in the botomfish fishery include prohibitions on the use of bottom trawls, bottom gillnets, explosives and poisons.

Logbook data (State of Hawaii), and observer programs conducted by NMFS indicate that total discards (including damaged target species) account for approximately 8 to 23 percent of the total catch in bottomfish fisheries in the Hawaiian archipelago (Nitta 1999, WPRFMC 1998a). Carangids, sharks, and miscellaneous reef fish (pufferfish, moray eels, etc.) are the most numerous discard species. Two species in particular, kāhala (*Seriola dumerili*) and butaguchi (*Pseudocaranx dentex*), make up the majority of the bycatch. Most species are not kept by vessels because of their unpalatability, however some carangids (large jacks and amberjacks) are also discarded because of concerns of ciguatera poisoning[14]. Butaguchi, which commands a low price in the Hawaii market, may be discarded in the early days of a fishing trip to avoid reducing vessel hold space for more valuable bottomfish and because this species has a poor on-board "shelf-life." The major discard species in the NWHI bottomfish fishery are given in Table 20. It should be noted that a large percentage of the snappers and the grouper listed there are included as bycatch because of damage from sharks.

In bottomfish fishing operations the largest proportion of lost fish and gear is attributable to interactions with sharks (Nitta 1999). Some fishing areas are so plagued with sharks that a majority of hooked fish are either stolen or damaged. The estimated economic losses experienced by fishermen as a result of shark interference with fishing operations are substantial (Kobayashi and Kawamoto 1995). In the NWHI the gray reef shark (*Carcharhinus amblyrhnchos*) is the worst offender. When shark interactions become a problem, some fishermen will attempt to kill sharks by catching and/or shooting them. During the late 1990s, an increase in the market demand for shark fins resulted in some bottomfish vessels "finning"[15] the sharks that were killed. In 2000 however, both the State of Hawaii and the federal government implemented legislation that required the entire shark carcass to be landed along with the fins (HRS § 188.40.5 and CFR 600.1023, respectively). This legislation has curtailed shark-finning in the bottomfish fishery. Limitations in hold space and limited marketability preclude most bottomfish vessels from retaining shark carcasses.

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[14]Ciguatera fish poisoning results from eating a fish containing a neurological toxin produced by a microscopic dinoflagellate algae. The algae grow epiphytically on benthic macroalgae (seaweeds) and are ingested by herbivorous fish which in turn are eaten by larger carnivorous fish, with each step concentrating the toxin. In humans, ciguatera poisoning may cause severe illness or even death.

[15]"Finning" is the practice of removing the fins from a shark and discarding the remainder of the carcass at sea.

Table 20: Discards from Bottomfish Fishing Trips with NMFS Observers 1990-1993

SPECIES	TOTAL NO. CAUGHT	TOTAL NO. DISCARDED	TOTAL % DISCARDED
Kāhala	2438	2266	92.9
Kalekale (yellowtail)	40	22	55
Sharks	176	92	52.3
Misc. fish	115	59	51.3
Ulua (white)	127	62	48.8
Misc. snapper/jack	189	91	48.1
Butaguchi	3,430	1,624	47.3
Ulua (black)	23	10	43.5
Taape	110	40	36.4
Misc. fish unidentified	174	26	14.9
Kalekale	874	52	6
ōpakapaka	5,092	107	2.1
Ehu	1,185	20	1.7
Uku	2,209	28	1.3
Hāpuupuu	1,593	19	1.2
Gindai	459	3	0.7
Onaga	1,141	8	0.7
Alfonsin	1	0	0
Armorhead	1	0	0
Lehi	3	0	0

Source: Nitta 1999

Data collected by NMFS during research bottomfish fishing cruises indicate the potential species composition of bycatch in the NWHI bottomfish fishery (Figure 10). Research bottomfish fishing is less likely to exclusively successfully target commercial species, however, Figure 10 indicates other species that may be caught in association with bottomfish fishing operations.

The most recent data available (WPRFMC 2004b) reinforce the trends described above, including the differences in strategy between Mau and Ho'omalu Zone operations. In both zones in 2002, 100 percent of the sharks and kāhala were discarded. In the Mau Zone, butaguchi was frequently discarded in 2002 (22 percent), unlike in 2001 when only 1 percent was discarded. The only other significant discard was ōmilu (*Caranx melampygus*) at 9 percent, down from 38 percent in 2001.

In the Ho'omalu Zone, several lesser valued species were commonly discarded, including kalekale (48 percent in 2002, 24 percent in 2001), butaguchi (20 percent in 2002, 32 percent in 2001) and white ulua (*C. ignoblis*) (63 percent in 2002, 70 percent in 2001).

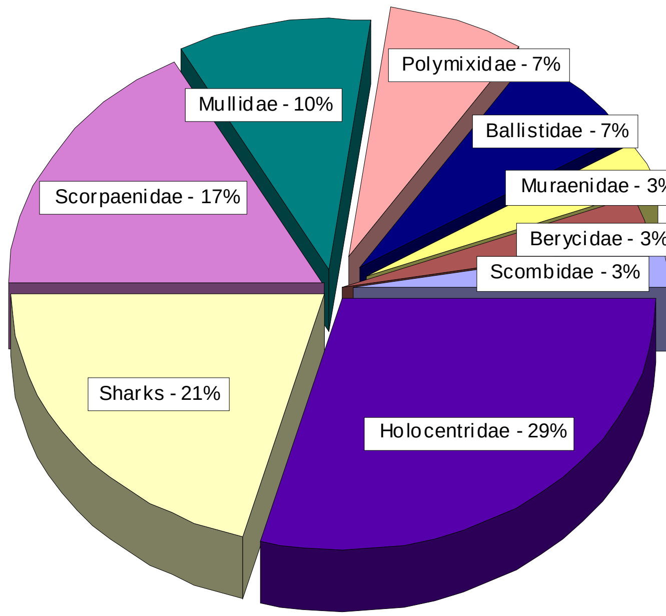

Figure 10: NMFS Research Cruise Estimates of Composition of Bottomfish Bycatch
(Percent of total number; Source: WPRFMC 1998a)

Economic Performance

As shown in Figure 11 the inflation-adjusted gross revenue in the NWHI fishery grew dramatically in the mid-1980s and then declined as landings fell. Inflation-adjusted revenue in 2002 was only 20 percent of the 1987 peak. In recent years, the annual ex-vessel value of bottomfish landings in the NWHI fishery has averaged about $1,000,000.

Historically, bottomfish caught in the main Hawaiian Islands tended to have higher aggregate prices, reflecting both species composition and greater freshness. However, the MHI price declined in general in 1990s, while NWHI price was relatively steady during the same period. This relative lowering of the MHI bottomfish prices may have reflected the softness of the upscale part of the Hawaii market. As a result, it brought the prices of the two areas to a similar range in 1999, and slightly converge in 2000 as NWHI price was $3.76 and MHI was $3.75. In 2001, the prices from both areas drops, but to a greater degree for bottomfish caught in the Northwestern Hawaiian Islands. In 2002, the prices from both areas increased slightly, but in a

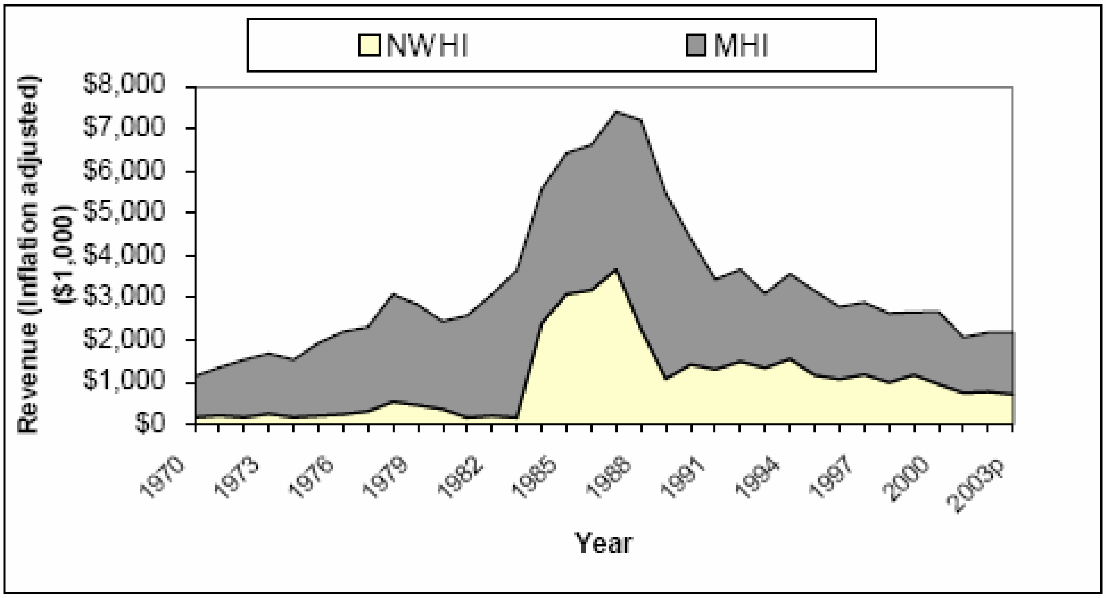

Figure 11: Hawaii Bottomfish Fishery Revenue (inflation adjusted) by Area
(Source: WPFMC 2004)

greater degree for the MHI price. In 2003, the MHI price continued the increase trend from 2002, while the MWHI price fell slightly. As a result, the MHI price was higher substantially, $1.22 per pound, than NWHI in 2003.Onaga and opakapaka comprise the largest valued landings in each area for most years (ignoring the highly fluctuating landings of uku); NWHI ex-vessel prices were $4.53 and $4.79 per pound respectively in 2003 while MHI were $5.89 and $5.01, respectively (Figure 12). However, the NWHI landings are comprised of a higher percentage of these higher priced species compared to the MHI, so the difference in price for individual species by area is ironed out by the different species compositions between the two areas.

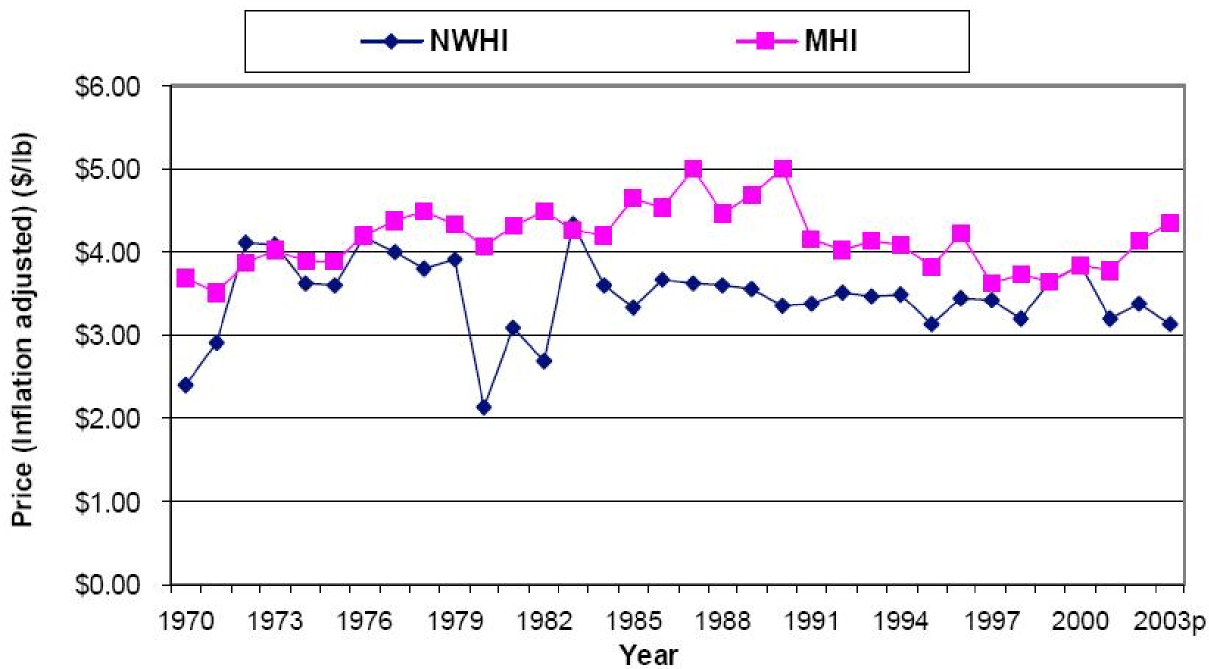

Figure 12: Average Price/lb for Hawaii Caught BMUS
(Source: WPFMC 2004)

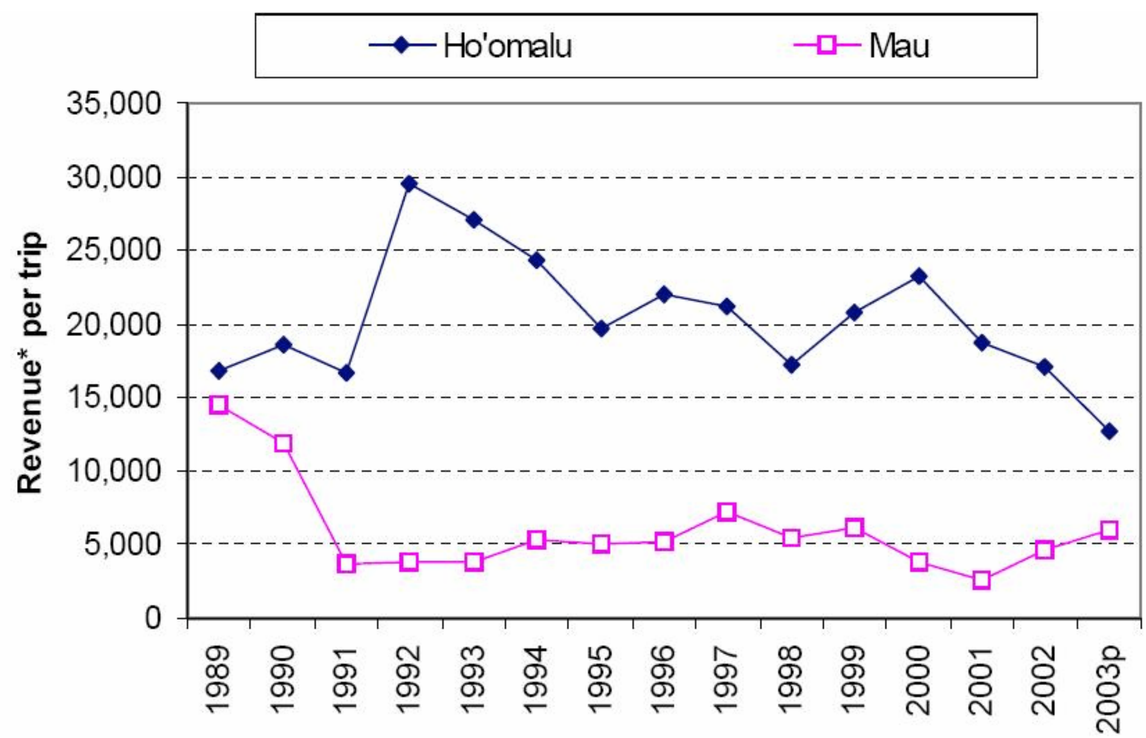

Figure 13: Mau Zone and Ho'omalu Zone Average Revenues Per Trip
(Source: WPFMC 2004)

Independent, owner-operator fishing operations prevail in both zones of the NWHI bottomfish fishery. In 1988, a limited access program was established for the Ho'omalu Zone, the primary motivation for which was avoidance of economic overfishing (Pooley 1993b). When the limited access program provisions began to take effect in 1989-91, the revenue per trip for Ho'omalu Zone vessels rose dramatically (Figure 13). Since that time the revenue per trip in the Ho'omalu Zone has consistently been higher than that of the Mau Zone.

The two trends in inflation-adjusted revenue per trip show the distinct difference between Ho'omalu and Mau zone operations. When the limited entry provisions began to take effect in the Ho'omalu zone in 1989-91, revenue rose dramatically but has subsequently declined to slightly more than its average for the period. Revenue (inflation-adjusted) in the Mau Zone initially fell (as the limited entry vessels could no longer fish in the Mau zone, only smaller boats remained in the Mau zone). After that initial drop, however, revenue per trip in the Mau Zone rose for several years, but has subsequently declined from 1997 to 2001. Revenue per trip in Mau Zone rose again in 2002 and 2003, while it declined in Ho'omalu Zone. The limited entry program, which was implemented in the Mau Zone in 2001, may has improved the economic performance for the vessels that have a permit to fish in the Mau Zone.

Estimates of annual net revenue for vessels operating in the Mau Zone and Ho'omalu Zone were first presented in a 1993 cost-earnings profile of the NWHI bottomfish fishery (Hamilton 1994). The study revealed that on average Ho'omalu Zone vessels realized a positive economic return of $2,238 per vessel in 1993 while Mau Zone vessels averaged an economic loss of $21,947 per vessel. The principal factor explaining the disparity in the economic performance of vessels operating in the two zones was the difference in catch rates (Pan 1994). In comparison to boats fishing in the Mau Zone, boats operating in the Ho'omalu Zone caught more fish per fishing day and more of their catch consisted of high-valued bottomfish such as *onaga* and *ōpakapaka*.

Since 1993 however, the revenues of Ho'omalu Zone vessels have shown a downward trend due to decreasing catch rates for some species, particularly the high-priced *ōpakapaka.* As a result of this decrease in revenues, in recent years the average vessel fishing in the Ho'omalu Zone has failed to cover its total annual economic costs through bottomfish fishing (WPRFMC 2003). In 2000, Ho'omalu vessels averaged an economic loss of $38,047 per vessel (Table 21). The average vessel earned a positive return on operations, and presumably vessel owners derive sufficient income from other economic activities to cover fixed costs.

Table 21: Average Income Statement for NWHI Bottomfish Vessels 2000
(Source: WPRFMC 2003)

CATEGORY	MAU ZONE VESSELS	HO'OMALU ZONE VESSELS
Revenue	$38,639	$148,522
Fixed Costs:		
Capital	$4,093	$18,056
Annual Repair	$4,840	$12,694
Vessel Insurance	$2,833	$31,516
Administrative	$1,535	$7,441
Other	$0	$1,970
Total	**$13,301**	**$71,678**
Operating Costs:		
Fuel and Oil	$4,158	$9,958
Ice	$1,094	$2,298
Bait	$1,641	$5,253
Handling	$3,900	$14,900
Provisions	$1,751	$7,113
Gear and Supplies	$2,407	$8,426
Other (trip basis)	$3,283	$10,943
Crew's Income	$6,100	$35,000
Captain's Income	$8,800	$21,000
Total	**$33,134**	**$114,892**
Net on Operations	**$5,505**	**$33,631**
Total Cost	**$46,435**	**$186,569**
Net Revenue	**- $7,796**	**- $38,047**

Updated cost-earnings data for vessels operating in the Mau Zone indicate that the net economic returns to the average boat is still negative (Table 21). The poor economic performance of a substantial number of Mau Zone vessels has resulted in a considerable turnover pattern of entry and exit (Hamilton 1994). Between 1989 and 1997, over 15 vessels entered and left the fishery. Because access to the Mau Zone was unrestricted, economic failure of vessels in the fishery did not reduce fishing effort to more appropriate levels (WPRFMC 1998b). Bankrupt vessels were sometimes bought for a fraction of their initial capital cost and returned to the Mau Zone with new owners who believed that reduced capital servicing obligations would give them a competitive edge over other fishermen. In addition, vessels displaced from overfished U.S. mainland fisheries arrived in Hawaii at a steady rate on a “look-see” basis. These owners and captains were largely unaware of the economic performance of those vessels already fishing in the Mau Zone.

In 1999, a limited access program was established for the Mau Zone to support long-term productivity of bottomfish resources in the zone and to improve the economic stability of the fishery (WPRFMC 1998b). The limited access program is intended to decrease the large reserve of potential effort that could threaten the resources and allow attrition due to market forces and freedom of choice to reduce the Mau Zone fleet to more economically rational levels.

Markets

A market for locally caught bottomfish was well-established in Hawaii by the late nineteenth century. Today, fresh bottomfish continues to be an important seafood for Hawaii residents and visitors. Nearly all bottomfish caught in the NWHI fishery are sold through the Honolulu fish auction (United Fishing Agency, Ltd.). Prices received at the auction change daily, and the value of a particular catch may even depend on the order in which it is placed on the floor for bidding (Hau 1984). Bottomfish caught in the MHI fishery are sold in a wide variety of market outlets (Haight et al. 1993b). Some are marketed through the fish auction in Honolulu and intermediary buyers on all islands. Sales of MHI bottomfish also occur through less formal market channels. For example, local restaurants, hotels, grocery stores and individual consumers are important buyers for some fishermen. In addition to being sold, MHI bottomfish are consumed by fishermen and their families, given to friends and relatives as gifts, and bartered in exchange for various goods and services.

Historically, the demand for bottomfish in Hawaii has been largely limited to fresh fish. Seventy years ago Hamamoto (1928) remarked on the fact that fish dealers in Honolulu refused to buy fish that had been harvested in the NWHI and frozen on-board because the demand for this product was so low. In the last few years the price differential between frozen and fresh product has narrowed for some species of bottomfish, but it remains substantial for *onaga* and *ehu*, the two highest priced fish. Until the market for frozen bottomfish develops, participants in the NWHI fishery will be caught in the same on-going dilemma – they must stay out long enough to cover trip expenses, but keep the trips short enough to deliver a readily saleable, high-quality product (Pan 1994). In the past, bottomfish catches from the MHI have tended to command higher aggregate prices than those caught in the NWHI, reflecting a larger proportion of preferred species and greater freshness. Bottomfish caught around the MHI are iced for only one to two days before being landed, whereas NWHI fresh catches may be packed in ice for ten days or more. By the late 1990s, however, the prices appeared to converge, perhaps due to the softness of the upscale part of the Hawaii market as the state’s economic recession continued (WPRFMC 1999).

Catches of bottomfish around the MHI typically consist of plate-sized fish preferred by household consumers in Hawaii and by restaurants where fish are often served with the head on. Bottomfish caught around the NWHI tend to be the medium to large fish (over 5 pounds) preferred for the restaurant fillet market. Because the percent yield of edible material is high, handling costs per unit weight are lower and more uniform portions can be cut from the larger fish.

According to U.S. Customs data for the Port of Honolulu, 801,000 pounds of snapper were imported in 2003 worth $2.26 million ($2.82 per pound). This amounts exceeded domestic supply and thus was a significant factor in ex-vessel prices. Tonga and Australia were the largest sources of fresh snapper, with Fiji and New Zealand also being major sources. Not only has the quantity of foreign-caught fresh fish increased during the last few years, but the number of countries exporting fresh fish to Hawaii has also increased. A decade ago, for example, fresh snapper was exported to Hawaii mainly from within the South Pacific region. In recent years, Tonga and Australia were the largest sources of imported fresh snapper, with Fiji and New Zealand also being major sources, and Viet Nam, Chad (fresh-water fish) and Madagascar as minor sources.

Both the restaurant and hotel trade and the charter fishing industry are closely linked to the tourism base that is so important to Hawaii's economy. A 2004 survey of 24 chefs at Oahu's "white tablecloth" restaurants found that 77% of the chefs reported that bottomfish is on their list of "most desirable fish species" and 43% said that their customers are willing to pay more for Hawaii-caught bottomfish. Although other locations would fill the market demand in Hawaii, many Hawaii restaurant owners and chefs would prefer to have fresh locally caught bottomfish on their menus due to their marketable qualities , i.e. "fresh island fish" (Coffman 2004).

2.3.2 Crustacean Fishery

Most of the information in this section pertains only to the lobster fishery occurring in the NWHI. Because there are few shallow banks in the EEZ around the MHI, the MHI lobster fishery occurs almost entirely within State of Hawaii waters. One federally permitted vessel began to operate in the EEZ surrounding the MHI in 1997, but has since discontinued operations. The NWHI lobster fishery has been inactive since 2000 when NMFS scientists noted an increase in uncertainty of parameters used in the models that are used to predict exploitable populations and provide annual harvest guidelines (currently set at 13% of exploitable populations which has been estimated to result in a 10% risk of overfishing) (65 FR 39314 June 26, 2000). In 2001 NMFS clarified that the NWHI stock was not considered to be overfished (66FR 11156 February 22, 2001). Between 2000 and 2005, NMFS did not issue any harvest guidelines for this fishery, thus prohibiting fishing from occurring. In 2006 NMFS issued a harvest guideline of zero lobsters for the fishery, again prohibiting fishing from occurring. Since 2000, NMFS scientists have been assessing and improving their stock assessment models and a new model is anticipated to be available in the near future).

History

Ula (lobster) was a traditional source of food for Native Hawaiians and was sometimes used in early religious ceremonies (Titcomb 1978). After the arrival of Europeans in Hawaii, the lobster fishery became by far the most productive of Hawaii's commercial shellfish fisheries. Early in the twentieth century, Bryan (1915:469) wrote of the local market for spiny lobster: "The lively demand for them, owing to their excellent food qualities, brings large numbers of them fresh and sprawling into the markets every day." Bryan (1915:469) also noted that the slipper lobster was "quite common in the markets" and "is a favorite food of the native people." Cobb (1902) reported that the commercial lobster catch in 1901 was 131,200 lbs. The majority of the catch at that time was probably composed of the near-shore species P. penicillatus because fishing was confined to coastal waters around the MHI (Shomura 1987). According to Cobb (1902), lobster were taken with nets set around rocks, snared with a pole to which a noose was attached or captured by hand.

A rapid and substantial increase in Hawaii's population during the first decades of the twentieth century was accompanied by increased local demand for seafood and an expansion of the fisheries. The many immigrants to Hawaiifrom Asia possessed a strong fishing tradition and brought with them a culture in which fish was an integral part of the diet. Early commentary suggests that heavy fishing pressure soon depleted the lobster resources adjacent to the more populated areas of the MHI. In 1925, for example, Lorrin Thurston (1925), President and General Manager of The Honolulu Advertiser, wrote:

> In some of the out-districts of the other islands lobsters are still found; but on O'ahu they are so scarce that they are hardly ever found in the market. The few which are caught are monopolized by the higher class restaurants and hotels, and bring extravagant prices … So far as the general community is concerned, lobsters are practically locally extinct as an article of food.

By the early 1950s, the commercial catch of P. penicillatus around the MHI had dropped by 75 to 85 percent (Shomura 1987). The depletion of the fishery resources in the coastal areas of the MHI encouraged Hawaii's fishermen to search for alternative fishing grounds. In particular, the Honolulu-based "sampan" fleet began to venture north to fishing grounds around the NWHI. The boats traveling to these remote islands primarily targeted bottomfish, but they also harvested lobster and other marine animals (Iversen et al. 1990). The commercial potential of a NWHI lobster fishery was recognized by Bell and Higgins (1939), who wrote: "Doubtless there are unexploited aquatic resources of unsuspected size throughout the great expanse of islands and atolls in the Hawaiian Archipelago extending westward from Kauai. For example, abundant supplies of two species of spiny lobster (Palinuridae) are reported from the French Frigate Shoals and to the westward." However, full exploitation of the marine resources of the NWHI was hindered by the dangers of traveling to the more distant islands and the difficulty of maintaining the quality of the catch during extended trips (Konishi 1930; Shinsato 1973).

It was not until the late-1970s that the development of the NWHI lobster fishery was fully realized. NMFS, U.S. Fish and Wildlife Service and Hawaii Division of Aquatic Resources joined in a cooperative agreement to conduct a five-year assessment of the biotic resources of the NWHI (Grigg and Pfund 1980). The University of Hawaii Sea Grant College Program joined the study in 1977. Among the resource surveys conducted during the "tripartite-Sea Grant" investigation was a survey of the P. marginatus resource conducted at 26 sites. Of these study sites, only Necker Island and Maro Reef were reported to have sufficiently large stocks for commercial exploitation (Uchida and Tagami 1984).

Shortly after the survey began several commercial vessels began lobster trapping operations. The fishery was primarily developed by new fishermen coming to Hawaii from areas such as the Pacific Northwest where crustacean fisheries were experiencing declining catches (Clarke and Pooley 1988; Pooley 1993a). These newcomers came with large vessels, some over 100 ft in length, with advanced technology freezing and processing equipment (Pooley 1993a). In addition, a number of smaller, multi-purpose boats began fishing for spiny lobsters in the NWHI, combining that operation with bottomfish fishing (HDAR 1979).

A period of low catches was followed by a rapid increase in landings as more vessels entered the fishery and markets were developed (Polovina 1993). In the mid-1980s, the NWHI lobster fishery was Hawaii's single most lucrative fishery (Pooley 1993b). Changing gear from wire to plastic traps introduced from the U.S. mainland led to significant catches of slipper lobster, which had been essentially unexploited with wire traps, and an increase in fishing efficiency (Boehlert 1993; Pooley 1993a).

Trapping activity fell in 1987 principally due to the exit of several large vessels from the fishery (Samples and Sproul 1988), but landings reached a record high in 1988 when wind and sea conditions allowed for an extended period of fishing in the upper bank areas where spiny lobsters tend to congregate (Clarke 1989).

In 1990, however, lobster catch rates fell dramatically. Overfishing is not thought to be responsible for the decline (Polovina and Mitchum 1992). Rather, the decrease was likely due to a climate-induced change in oceanic productivity (Polovina et al. 1994). Nevertheless, the 1990 season showed that there was excessive fishing capacity in the industry given the reduced population size and raised concern that an economic threshold might not prevent overfishing (Polovina and Haight 1999). Responding to this concern, the Council established a limited access program and a fleet-wide seasonal harvest quota in 1991 that significantly altered fishing operations (Kawamoto and Pooley 2000). During the 1980s, fishery participants had averaged three trips per year to the NWHI, each trip lasting about two months (Polovina 1993). With the implementation of a fleet-wide harvest quota vessels no longer fished for lobster year round, but instead shifted from other Hawaii-based fisheries or moved from fisheries in Alaska or the West Coast to participate in a short-term (less than one month) lobster fishery concentrated on the banks around Necker Island, Gardner Pinnacles and Maro Reef that were the historic mainstays of the fishery. The lobster fishery was open from July to December but it typically closed earlier because the harvest quota was reached. Given the derby-style fishing conditions there was no incentive for fishermen to operate on secondary or marginal banks. From 1992 through 1997, Necker Island accounted for 48 to 64 percent of the total effort and Gardner Pinnacles and Maro Reef accounted for most of the remaining effort (WPRFMC 1999b). In 1998, the quota was allocated among four fishing areas (Necker Island Lobster Grounds, Gardner Pinnacles Lobster Grounds, Maro Reef Lobster Grounds and General NWHI Lobster Grounds) to prevent localized depletion of the lobster population at the most heavily fished banks and encourage fishermen to broaden the geographical distribution of their effort. The fishery has been essentially closed since 2000, due to concerns of NMFS scientists regarding the potential for overfishing the lobster stocks based on uncertanity in its population assessment models.

Fishing Methods and Use Patterns

Two distinct types of vessels have historically operated in the NWHI lobster fishery (Maine Aquaculture Innovation Center 2000). About one-third of the permit holders operate North Pacific catcher-type crab vessels that travel to Hawaii for the lobster season. The other two-thirds operate Honolulu-based vessels that were also used in the pelagic longline fishery. The North Pacific crabbers are larger than the longline boats, but every vessel had the capability to carry and deploy the maximum number of traps allowed (1200).

All participants in the 1999 NWHI fishery use a plastic dome-shaped, single-chambered traps with two entrance funnels located on opposite sides (Polovina 1993). Although the minimum size limit established in 1985 was revoked in 1996, traps are still required to have escape vents. The traps are typically fished in strings of several hundred traps per string. The traps are set before sunset in depths from 20 to 70 m, and retrieved the next day. Both spiny and slipper lobsters may be caught in the same trap, but fishermen can alter the proportion of each species by selecting the trapping area and depth (Polovina 1993). Almost all lobsters harvested were sold as a frozen tail product. Catch was processed, packed and frozen at sea by the individual vessels, in contrast to most other lobster fisheries in which each vessel’s catch is held live on-board and transported to shore-side plants for processing and packing (Sample and Gates 1987). From 1996 to 1998, the fleet also landed a significant quantity of live lobsters.

This is a seasonal fishery with vessel operators participating in other Hawaiior U.S. mainland fisheries during the remainder of the year. In 1999, the average vessel fished for lobster for 42 days (WPRFMC 2000). Although all participants in the lobster fishery engage in other fisheries, the lobster fishery occurs during a comparatively slow season for alternate fishing activities (NMFS 2000). Therefore, the lobster fishery may represent an important component of the participants’ annual fishing operations and income.

Fishing beyond September involves the risk of encountering severe weather. Poor sea conditions increase operational problems, increase trap losses and reduce the fishing effectiveness of traps (Maine Aquaculture Innovation Center 2000).

Necker Island, Gardner Pinnacles and Maro Reef are the most productive banks in the NWHI lobster fishery (Table 22). Since 1998, the first year that area-specific quotas were established, fishermen have spread out their effort over a larger area (Kawamoto and Pooley 2000). During both the 1998 and 1999 seasons all four subareas received fishing pressure. In 1999, the Necker Island, Gardner Pinnacles and Maro Reef Lobster Grounds were closed within two months while the “all other banks” area (General NWHI Lobster Grounds) remained open until the fishery was closed at the end of the year. Five of the six vessels that participated in the fishery that year fished in the General NWHI Lobster Grounds. Three vessels fished on Necker Bank and Gardner Pinnacles and four vessels fished on Maro Reef. The harvest from Necker Island, Gardner Pinnacles and Maro Reef accounted for about 75 percent of the total landings.

Table 22: Percentage of NWHI Lobster Catch at Selected Areas

AREA	PERCENT OF TOTAL CATCH
Necker Island	38.5
Maro Reef	34.0
Gardner Pinnacles	14.3
Pearl and Hermes Reef	6.7
Kure Atoll	2.8
Lisianski Island	1.5
French Frigate Shoals	1.2
Nihoa Island	0.6
St. Rogatien Bank	0.3
Pioneer Bank	0.1
Brooks Bank	0.0
Raita Bank	0.0
Twin Banks	0.0
Laysan Island	0.0
Midway Atoll	0.0

Source: M. Mitsuyasu, pers. comm. 2000. WPRFMC

Harvest

Between 1985 and 1991, total landings showed an overall downward trend (Figure 14). Since 1992, landings have been largely determined by a harvest quota. The catch per unit effort (CPUE) expressed as number of lobsters caught per trap haul showed an overall decrease between 1983 and 1991 (Figure 15). There was an increase in CPUE in 1996 and 1997, followed by another decline. It is uncertain, because of the lack of catch size data, if the increased CPUE in 1996 and 1997 resulted from the 1995 implementation of Amendment 9, which instituted the “retain-all” policy. The retain all policy was put into place to offset the high lobster mortality associated with the handling and discarding (e.g. predation) associated with the NWHI lobster fishery. Using an equilibrium yeild-per-recruit model, Kobayashi (2001) found that that the reproductive potential of the NWHI lobster population more than doubled and mean weight per individual increased by 22 percent if the mortality rate of lobsters was above 75 percent. In 1996, the fishery had a discard rate of 62 percent with the discard mortality presumed to be above 75 percent (Dinardo et al. 2002). In response, the Council amended the Crustaceans FMP in 1996 to require the retention of all lobsters caught in the NWHI lobster fishery so that these mortalities would be subject to the quota on total catch.

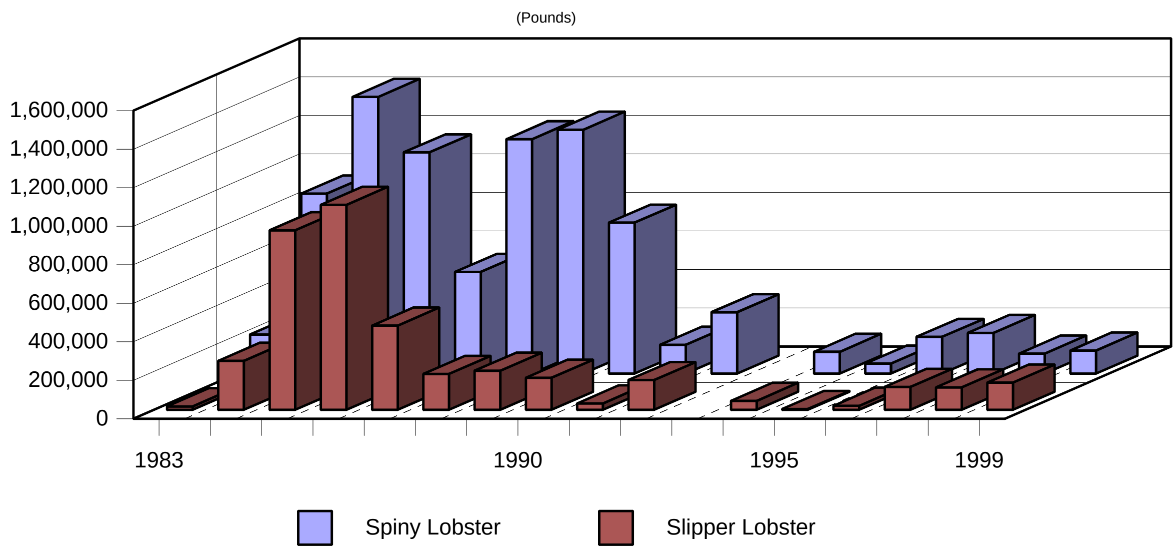

Figure 14: NWHI Spiny and Slipper Lobster Landings 1983-1999
(Source: PIFSC 2002)

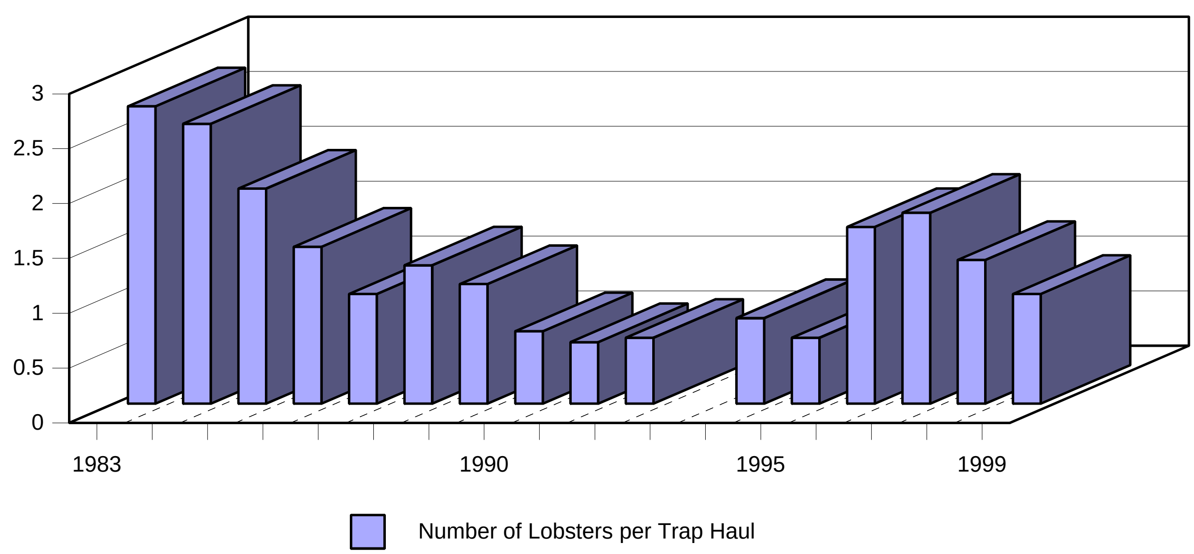

Figure 15: NWHI Lobster Fishery Catch per Unit Effort 1983-1999
(Source: PIFSC 2002)

Bycatch and Non-target Species

Non-targeted species account for a small percentage of the total catch in the NWHI lobster fishery, as the traps are designed for high selectivity. Also, all NWHI lobster traps are required to be equipped with escape vents. Using data from 1976-1991 (wire traps) and 1986-2003 (plastic traps) from research cruises in the NWHI, Moffit et al.(2005) examined the diversity of catch composition from the study over time. The traps used for the research do not have escape vents but otherwise conform to fishery regulations. Both wire and plastic traps were found to be highly selective, that is, they primarily catch lobsters. Wire traps caught a total of 82 species, of which the two target species of lobsters accounted for 90.5 percent by number. Plastic traps contained 258 species of which 73.1 percent were the two target species. Because lobsters are one of the larger organisms captured, they would be an even larger percentage if measured by weight. Of the organisms which were caught incidentally, hermit crabs made up the largest component followed by moray eels and small reef fish.

Octopus abundance was also evaluated due to its potential as a prey species for the Hawaiian monk seal. Only 83 individuals were captured during the entire 1986-2003 study period and examination of the data shows no significant decline or increase in abundance over time. Based on the data, the study found that it is unlikely that lobster trapping activities have lowered octopus abundance to such a degree that monk seal populations would be negatively impacted.

Overall, Moffit et al. (2005 in review) concluded that lobster trapping activities are responsible for changes in abundance of a few species (target species have declined and some crab species have increased due to competitive replacement) of the benthic community in the NWHI, but do not appear to have resulted in major changes to the ecosystem. Moffit et al. also state that gear lost in this fishery has not been found to be ghost fishing (still catching organisms), and that although direct damage to the benthic habitat by the traps has not been studied, it is not likely to be substantial due to the low relief, hard substrate that characterizes the fishing grounds.

Participation

At present, the 15 federal limited access permits for the NWHI lobster fishery are owned by 12 permit holders.[16]

16 The federal regulations that established the limited access program for the NWHI lobster fishery in 1992 prohibit an individual, partnership or corporation from holding a whole or partial interest in more than one permit. However, two qualified individuals who held multiple permits at the time the limited access program was implemented were allowed to retain all of their permits.

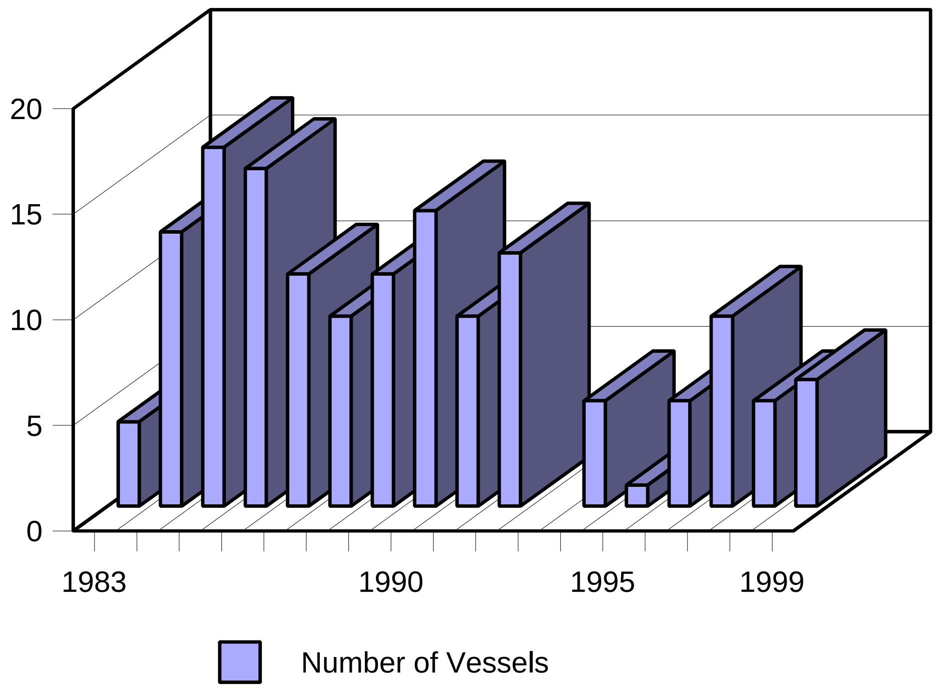

Figure 16: Trend in Number of NWHI Lobster Vessels

During the first years of the fishery the turnover of participants was relatively high due to the profit seeking entry-exit behavior by vessel owners who were flexible in the choice of fishing activities (Samples and Sproul 1988). The high turnover continued after 1992, the first year of the limited access program and harvest quota. The quota announced prior to the start of the fishing season weighed heavily in the participation decision as did the annual start-up costs of participating in the lobster fishery and the potential earnings in alternative fisheries (Kawamoto and Pooley 2000). In addition, during the first five years of the limited access program there were a total of 20 permit transfers. By 1997, less than half of the permits that were issued in 1991 were still held by the original recipients.

To date, approximately 37 limited access permits to participate in the NWHI lobster fishery have been issued, but only 19 of the permits have been actually used. The turn-over rate has been fairly high, with only 4 of the 19 active permit holders participating in the fishery for more than two years (Katekaru, 2001, pers. comm.).

Economic Performance

The total gross revenue of the NWHI lobster fishery has followed the trend in landings (Figure 17).The average gross revenue per trap has declined sharply since 1997 due to the overall decrease in CPUE and the higher catches of slipper lobsters which have a smaller average size and lower ex-vessel value in comparison to spiny lobsters (Kawamoto and Pooley 2000).

A cost-earnings study of the NWHI lobster fleet was conducted by Clarke and Pooley (1988) based on economic data collected in 1985 and 1986. The study found that despite record revenues in the fishery in 1986, fishermen as a group earned little or no economic profit. Low fleet net returns appeared to be tied to high fishing costs and diminished average catch rates. That study does not reflect current operational characteristics of the fleet, as the fishery in the mid-1980s was essentially a year-round fishery.

Since the mid-1980s, adjustments in the regulatory regime for the fishery have changed the economic conditions of the fishery (Pooley and Kawamoto 1998). Because the fishery is now seasonal rather than year-round, start-up costs have become significant determinants in yearly participation by permit holders. The brief fishing season means that fixed costs have to be amortized over a shorter time period. Similarly, travel costs have become a higher percentage of total costs due to a decrease in the number of fishing days per trip. The establishment of area-specific quotas in 1998 and the resultant successive closure of banks during the 1998 and 1999 seasons as quotas were reached caused an increase in travel times and associated vessel operating costs as vessels were forced to move from bank to bank (WPRFMC 1999).

At least some of the permit holders have been able to adapt to these changing economic conditions. Fishery participants during the 1998 season realized a positive return on operations (gross revenues less operating costs) and were able to cover a portion of their fixed costs (WPRFMC 1999). In addition, the market value of the freely transferable limited access permits indicates that both economic and financial profits can still be earned in the fishery. Although the price of transferred permits is not recorded by NMFS, dockside reports in 1998 indicated that a permit was worth $40,000 to $100,000 (Pooley and Kawamoto 1998). However, the fact that generally only about half of the permits holders participated in the fishery in recent years suggests that profits from lobster fishing are low as compared to other available activities (Maine Aquaculture Innovation Center 2000). The MHI represent the young portion of the Hawaiian Archipelago. Consequently, they have less well-developed fringing reefs that have not subsided as far below sea level as those in the NWHI (Green 1997). The best reef development and highest live coral cover in the MHI are found in areas sheltered or partially sheltered from open ocean swell (Grigg 1997).

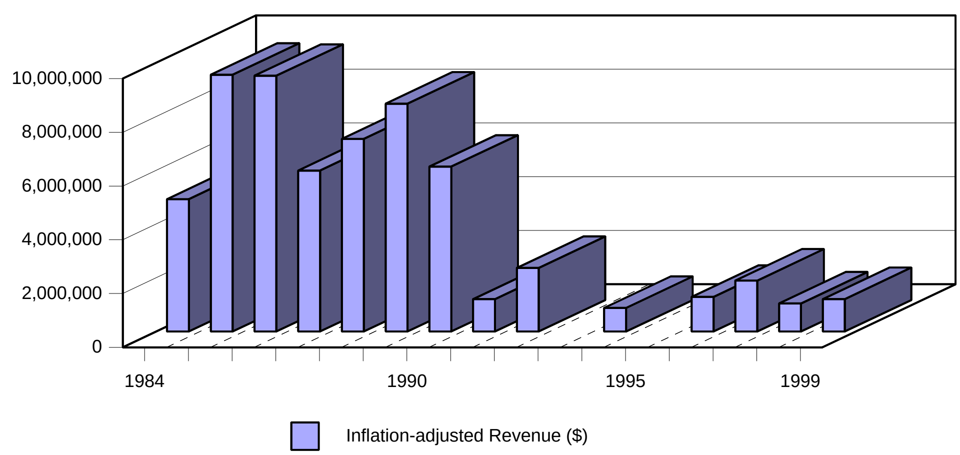

Figure 17: NWHI Lobster Fishery Revenue (inflation adjusted) 1983-1999
(Source: PIFSC 2002)

Markets

As an internationally traded commodity, supply and demand circumstances for lobsters tend to be volatile, resulting in frequent price adjustments (Samples and Gates 1987). In addition, the Hawaii fishery has changed over the years in terms of target species and product form. In the early years of the fishery (1977-1984) landings consisted mainly of spiny lobsters. However, for a three-year period from 1985 to 1987 the fishery targeted a previously lightly exploited population of slipper lobsters (Polovina 1993). Between 1988 and 1997 the target was again spiny lobsters, but the catch in 1998 and 1999 consisted mainly of slipper lobsters.

The traditional way of marketing lobsters in Hawaii was selling them live in local markets (HDAR 1979). In 1978, however, a Hawaii-based fishing company leased a modern fishing boat from the U.S. mainland equipped with on-board refrigeration for storing frozen lobster tails. Soon almost all lobsters harvested in Hawaii were sold as a frozen tail product to Hawaii and U.S. mainland buyers (Pooley 1993). This product form dominated until 1996, when the fleet landed a significant amount of live lobsters, which were exported to Japan, Taiwan and Hong Kong or sold in up-scale restaurants in Hawaii (Pooley and Kawamoto 1998). In 1999, however, nearly all fishery participants reverted to producing frozen tails because of a drop in the price of live spiny lobsters caused by the economic downturn in Asia (Kawamoto and Pooley 2000).

Because the NWHI lobster fishery is relatively small and harvest levels have fluctuated widely, product marketing has been challenging (NMFS 2000). Typically, seafood wholesalers and retailers prefer predictable and reliable supply sources. However, NWHI lobster have established a reputation as a locally-produced quality product, and fishery participants have found buyers willing to participate on a seasonal basis.

Imports of frozen lobster tails into Hawaii from various Pacific Basin countries have shown an overall decline over the past decade, from 41,023 lbs in 1990 to 3,866 lbs in 1999 (NMFS Fisheries Statistics and Economics Division n.d.). A small number of live spiny lobsters are imported into Hawaii from Australia and Kiribati. The average annual amount during the 1990s was been about 1,450 lbs (NMFS Fisheries Statistics and Economics Division.) Again, the fishery has been essentially closed since 2000, due to concerns of NMFS scientists regarding the potential for overfishing the lobster stocks based on uncertanity in its population assessment models.

2.3.3 Precious Corals Fishery

Precious corals are known to exist in the EEZ around Hawaii and very likely exist in the EEZ around American Samoa, Guam, the Northern Mariana Islands and the Pacific Remote Island Areas, but virtually nothing is known of their distribution and abundance in those areas. To date, beds of pink, gold and/or bamboo coral have been found at seven locations in the Council's jurisdiction, all in the EEZ around Hawaii. This number includes a recently discovered bed near French Frigate Shoals in the Northwestern Hawaiian Islands (NWHI). There are also two known major beds of black coral in the Council's area, as well as several minor beds (Grigg 1998a).

Most of these are located in Hawaii's state waters, however the largest (the Au'au Channel Bed) extends into the EEZ.

Precious coral beds are treated as distinct management units because of their widely-separated patchy distribution and the sessile nature of individual colonies. There are two known major black coral beds in Hawaii's EEZ, these are not identified by regulation and to date have not been actively managed by this FMP. There are currently six identified deep water (pink, gold, bamboo) precious coral beds which are classified as established, conditional, refugia or exploratory. Established beds are ones for which appraisals of the MSY are reasonably precise. To date, only the Makapu'u Bed has been studied adequately enough to be classified as established.

Conditional beds are ones for which optimum yields are estimated on the basis of bed characteristics relative to established beds. Four beds of precious corals are classified as conditional. Refugia beds are areas set aside for baseline studies and possible reproductive reserves. No harvesting of any type is allowed in those areas. The single refugium bed that has been designated - the Westpac Bed - is also located in the EEZ surrounding Hawaii. Exploratory areas are the unexplored portions of the EEZ. Separate exploratory permit areas are established for Hawaii, American Samoa, Guam and the remote US Pacific Island possessions. The classification and bounds of each bed are described in the FMP and are presented in Table 1.

Only selective gear is permitted in the EEZ around the main Hawaiian Islands, i.e., south and east of a line midway between Niihau and Nihoa Islands. Selective gear is defined in the FMP as gear used for harvesting precious corals that can discriminate or differentiate between types, size, quality or characteristics of living or dead corals. Because NMFS disapproved those aspects of the Council's recommendation that would have extended this prohibition to the NWHI, use of both selective and non-selective gear is currently permitted on the conditional beds of Brooks Bank and the 180 Degree Fathom Bank and throughout the exploratory area around the NWHI (67 FR 11941 March 18, 2002).

History

In 1965, Japanese coral fishermen discovered a large bed of pink coral (*Corallium* spp.) on the Milwaukee Banks in the Emperor Seamount Chain near the northwestern end of the Hawaiian Archipelago (Grigg 1993). Intermittently, over the next two decades dozens of foreign vessels employed tangle-net dredges to harvest precious corals in the waters around the NWHI. During the 1980s, Japanese and Taiwanese coral vessels frequently fished illegally in the EEZ near the Hancock Seamounts (Grigg 1993). In 1985, Taiwanese vessels reportedly poached about 100 tons of pink coral from north of Gardner Pinnacles and Laysan Island (Grigg 1993). The discontinuation of poaching in the late 1980s probably indicated that the resources in those areas were reduced to the point that the fishery was no longer economically viable. (Carleton 1987).

In 1966 researchers at the University of Hawaii located a small bed of pink coral off Makapuu, Oahu. Over the next three years, a small group of fishermen harvested this bed using tangle net dredges. By 1969, the precious coral industry in Hawaii was producing about $2 million in retail sales. Part of these sales consisted of pink coral jewelry imported from Taiwan and Japan. Further research on precious corals conducted by the University of Hawaii led to the development of a selective harvesting system using a manned submersible. Starting in 1973, Maui Divers of Hawaii, Inc., the leading manufacturer and retailer of precious coral jewelry in Hawaii, adopted this system for the commercial harvest of pink, gold and bamboo coral at the Makapuu Bed. However, harvest operations were discontinued in 1978 because of high operating costs.

In 1988, the domestic vessel *Kilauea* used a tangle net dredge to harvest beds at Hancock Seamount. The owners of the *Kilauea* received a federal Experimental Fishing Permit that allowed them to collect an amount of precious coral in excess of the harvest quotas that had been established by the WPRFMC in 1980. However, their catch consisted mostly of dead or low quality pink coral, and the operation was soon discontinued (Grigg 1993). One company in Hawaii experimented with manned submersibles and remotely operated vehicles (ROVs). These technologically advanced devices are equipped with spotlights, cameras and a variety of maneuverable tools. It is possible to harvest individual colonies, place the cut material in collecting cages and bring them to the surface in a highly controlled and efficient manner (Carleton 1987). While this fishing gear is still very expensive, innovations in submersible technology within the petroleum and defense industries during the past two decades have significantly reduced the capital and operating costs. In particular, the expense of operating manned submersibles has declined, one reason being that the submersibles are smaller and, consequently, the tender vessels can be smaller. This operation has been discontinued.

The worldwide glut of *Corallium* produced during the boom years of the early 1980s caused the market value of pink coral to fall even below breakeven prices for Taiwanese and Japanese coral fishermen (Grigg 1993). Consequently, many fishermen dropped out of the fishery and the worldwide supply of deep-water precious corals has dwindled. For the past 20 years Hawaii businesses engaged in the manufacture of deep-water precious coral jewelry have relied on local stockpiles of gold coral and imports of pink coral from foreign suppliers. Prices for precious corals gradually increased, and specimens of the highest quality pink coral currently sell for $5,000/lb in international auctions. However, changes in the jewelry industry during the past decade may have diminished the demand for precious corals. Products such as black pearls have captured a substantial share of the market formerly held by precious corals (C. Marsh, Maui Divers of Hawaii, Inc., pers. comm.). In 1993 Hawaii’s precious coral jewelry industry was valued at about $25 million at the retail level (Grigg 1993).

2.3.4 Coral Reef Ecosystems Fishery

MHI Fishery

In recent decades, there has been a notable decline in nearshore fishery resources in the main Hawaiian Islands (Shomura 1987). Overfishing is considered to be one of the major causes of this decline (Grigg 1997; Harman and Katekaru 1988), but coastal construction, sedimentation, and other effects of urbanization have caused extensive damage to coral reefs and benthic habitat near the populated islands.

The majority of the total commercial catch of inshore fishes, invertebrates, and seaweed comes from nearshore reef areas around the MHI. The exceptions are crustaceans: over 90 percent of the spiny lobster landings come from the NWHI and over 50 percent of Kona crab landings come from Penguin Bank.

Limited information is available on coral reef fish community structure at Penguin Bank. An investigation of deepwater artificial reefs on the bank, using manned submersibles, recorded 62 taxa (25 families), of which 32 were considered resident, 25 transient, and five incidental (Friedlander 1996). Estimates of mean biomass ranged from 3-290 mt/km^2 for resident species to 90-2,460 mt/km^2 for transient species. However, these estimates are considered high for the area, since several studies have shown that artificial reefs tend to support a higher biomass than natural reefs under similar circumstances.

An investigation of the deepwater macroalgal community, using a manned submersible, provides information on algae at Penguin Bank (Norris *et al.* 1995). The bank consists of a broad carbonate platform (~60m deep) covered with loose carbonate rubble and coarse sediments from the calcareous green alga, *Halimeda.* The algal community, comprising 54 species, is characterized by two deepwater species and many species that occur in shallow water. The deeper areas of the bank (182 m) are dominated by crustose coralline algae.

When reef-associated species that are presently managed under other Council FMPs are excluded from the analysis, almost all of the coral reef fisheries in Hawaii take place in inshore (state) waters in the MHI (Friedlander 1996). For example, in Hawaii less than 12 percent of the inshore fishes are caught in federal waters, based on reported commercial catch from 1991-1995. Similarly, only 18 percent of molluscs, 1 percent of seaweeds, and no echinoderms are harvested in federal waters. Of the crustaceans, less than 50 percent of the reported commercial catch of Kona crab—or 14,191 lbs. valued at $57,436—were taken in federal waters on Penguin Bank. Overall, only 1 percent of total catch, measured either by weight or value, comes from EEZ waters.

The top species by weight and value in the DAR inshore fish category were soldierfishes (*Myripristis* spp.), parrotfish (*Scarid* spp.), surgeonfishes (including *Acanthurus dussumieri*, *A. trostegus* and *Naso* spp.) and goatfishes (including *Mulloidichthys* spp.). Inshore fishermen target some of these species (especially the goatfishes *Parupeneus porphyreus* and *P. cyclostomus*), since they can fetch a high price in some seasons (Friedlander 1996). *Tilapia* spp. ranked high in terms of catch, but because it sells for a low price, it does not rank very high in terms of value. In the MHI, 89 percent of the catch of these species came from state waters.

Crabs are also an important group for commercial, recreational, and subsistence fishermen in Hawaii, with a mean annual commercial value of $182,182 (Friedlander 1996). The dominant species in the catch is Kona crab (*Ranina ranina*) with more than 28,000 lbs. caught annually. By weight, 51 percent of Kona crab are caught on Penguin Bank, which has long been an important location for Kona crab net harvests of (Onizuka 1972). In contrast, almost all of the other crab species were caught less than 2 nm from shore in the MHI.

NWHI Fishery

Surveys of the NWHI demonstrate that coral reefs are in good condition (Maragos and Gulko 2002) with high standing stocks of many reef fish. Nearshore coral reefs receive little human use because of their remoteness, exposure to harsh seasonal ocean conditions, and their protected status as part of a national wildlife refuge. Most of the shallow reefs of the NWHI lie within the boundaries of the State of Hawaii, where access and resource use are controlled by special permit.

There is a long history of fishing in the NWHI. Iverson et al. (1989) found ample evidence of fishing by the ancient Hawaiians as far northwest as Necker Island. Starting in the 1920s, a handful of commercial boats ventured into the NWHI to fish for shallow and deepwater bottomfish, spiny lobsters, and other reef and inshore species. Black-lipped pearl oysters at Pearl and Hermes Reef in the NWHI were overfished in the late 1920s and recent surveys show that stocks have still not recovered, due to lack of suitable oyster shell habitat (Green 1997). As discussed in the previous section, from the late 1940s to the late 1950s, there was a fishery for *akule* and reef fish around French Frigate Shoals and Nihoa Island.

Currently, there are no coral reef fisheries operating in the NWHI. Occasional visitors, including federal government personnel and contract workers at Midway Atoll, fish recreationally in the NWHI. Because NMFS disapproved those aspects of the Council's Coral Reef Ecosystems Fishery Management Plan that would have applied to the NWHI (69 FR 8336 February 24, 2004), there are currently no federal MSA permit or reporting requirements or other management measures for commercial or recreational fishermen targeting these species in the NWHI.

Bycatch and Non-target Species

All gears used to catch coral reef species are essentially artisanal in nature. Catch rates are minimal, usually only a few pounds per man-hour or other unit of effort. Large catches thus depend on fishing methods employing a lot of people, such as driven-in-net fishing or group spear fishing. Because of the characteristics of gear and methods, in most cases coral reef fishing generates very little bycatch. Bycatch is further reduced because almost all reef fish taken are eaten.

In the Pacific Islands, discards, where they occur, are usually due to cultural or practical reasons. In some cultures customary taboos may still adhere. For example, people may avoid nearshore copraphageous scavengers, such as surf perches (Theraponidae) for this reason. Taboos may also stem from the association between a species and gender, as is the case with moorish idols (Zanclidae).

Reef fish preference is also strongly influenced by urbanization: many city dwellers eat a narrower range of reef fish than their brethren in traditional villages on the same island or of the same culture. For example, in Guam triggerfish, butterflyfish, angelfish, and damselfish are typically rejected because they are considered too boney and lacking sufficient meat, while in rural areas in Micronesia these species are readily consumed. Some reef fish in Hawaii state waters are also subject to minimum size and weight restrictions for sale or for capture by spearfishing. These include species of parrotfish, goatfish, jacks, surgeonfish, mullet, milkfish, and threadfins.

In other cases, fish may be avoided due to toxicity. Puffers, toad fish, and porcupine fish (Tetraodontidae, Diodontidae) carry ichthyotoxins, while ichthyosarcotoxicity due to ciguatoxins and related toxins cause people to avoid a wide range of species, including the snapper *Lutjanus bohar*, surgeon fish *Ctenochaetus* spp., moray eels (Muraenidae), groupers (Serranidae), amberjack (*Seriola dumerilli*), and barracuda (Sphyraenidae).

Three fishing gears predominate in Pacific Island coral reefs and lagoons: hook-and-line or handline, spearguns and gillnets. The bycatch characteristics of each of these gear types are summarized below.

Hook-and-Line: Hook-and-line catches generally target carnivorous species of fish, although herbivores can be enticed to take baited hooks. Catch and selectivity of hook-and-line gear is a function of hook size, bait used, and the depth fished. Hook size and bait can select for size, with larger hooks and harder baits tending to catch larger fish. Similarly, fish size tends to increase with depth on the reef slope, although species diversity tends to decrease. Fishermen may use combinations of these factors to sharpen the focus of their fishing, particularly targeting bottomfish on the deep reef slope.

The amberjack *Seriola dumerilii*, frequently a part of deep-slope bottomfish catches in the NWHI, are discarded because they are thought to carry worms and the ciguatera toxin which makes marketing this species difficult. This is reinforced by the selectivity of fish by the fish auction at Honolulu which do not accept these fish. However, small amount of amberjack may be retained for use as bait in crab pots. The other major discard in this fishery is the thick-lipped trevally or *butaguchi* (*Pseudocaranx dentex*), which has a fairly short shelf life and commands a low price in local markets. Therefore, it is often discarded in the early days of a trip to avoid losing room for more valuable fishes, but is retained in the later days to fill fish holds if necessary.

***Spearfishing*:** Underwater fishing with spearguns—either with scuba or snorkels—is extremely selective, since the act of capture involves a deliberate choice of target. Bycatch is likely restricted to speared fish that escape with minor wounds. Spearfishing tends to select by size, with a bias towards larger size fish and larger sizes of a given species (Dalzell 1996). Catch composition may also be different between day and night when different groups of fish are active or sedentary. Night divers can take advantage of the sleeping habits of some parrotfish to cluster in "dormitories" on the reef and therefore be especially vulnerable to spearing.

Hawaiian spearfish catches are dominated by parrotfish, surgeonfish, octopus, and squirrelfish. In areas with greater reef fish diversity, such as Guam, spearfish catches are still mainly dominated by surgeonfish, and parrotfish. Other common families—such as rabbitfish, emperors, snappers, and jacks—also contribute to catches.

***Fish Traps*:** Fish trapping for finfish is not widely practiced in the Western Pacific Region, and is only conducted with any frequency in Hawaii. Traps, like nets, take a large random assortment of different species that probably reflects the proportions of different species groups on coral reefs. Surgeonfish dominate catches in Hawaii, making up 31 percent of commercial landings, and are comparable to reef fish catches in traps elsewhere in the Pacific (Dalzell 1996).

Selection effects in traps are a function of the soak time, mesh size, materials used to construct the traps, trap design, and the depth and position of the set. Traps set in relatively shallow water with little or no bait will generally maximize catches within 4-5 days. Traps baited with fish such as *aku* (skipjack tuna) or sardines and set on deep reef slopes may catch sizeable quantities of fish in a matter of hours rather than days, but the composition is very different, reflecting the generally large highly mobile carnivore complex of the deep reef slope.

***Nets*:** In Hawaii, gillnets mostly catch the bigeye scad or *akule*. Other dominant species include surgeonfish, snappers, goatfish, and rudderfish. Goatfish, surgeonfish, parrotfish, and siganids are dominant features of gillnet catches in Guam. There are differences between night and day gillnet catches, with some nocturnally active species such as slipmouths composing part of night gillnet sets.

For smooth fusiform—or cigar-shaped—fish, gillnets tend to select a normally distributed size range, with the lower and upper size limits dependant on mesh size. Spiny fishes may be very vulnerable to gillnet catches, regardless of mesh size, because of tangling. Seasonality can also influence gillnet catches. Fish become more vulnerable during spawning season because gonad development increases their girth and spawning changes behavior (Ehrhardt and Die 1988). The selection effects of gillnets are further complicated by the type of material used, the hanging ratio or measure of meshes per unit of length, the way the net is deployed on a reef, the time of day set, and length of soak. If gillnets are not checked regularly, bycatch may increase. Entangled fish build up in the net; if they are not removed, they are either preyed on or rot and become unsaleable.

Seine nets are actively deployed around schools of fish, as opposed to gillnets, which—like fish traps—are a passive gear. Beach seines, as the name implies, are set in an arc from the beach. Both wings are drawn together on the beach and hauled to concentrate the fish in the head of the net, from where they can be bucketed ashore. Seine nets can also be used for drive-in-net, or muro-ami, fishing. A barrier net is set in the lagoon or on a reef, and fish are driven with scare lines into the apex of the net, which is then closed to catch the fish. The amount of bycatch from this type of fishing depends on whether people are largely urbanized and used to eating a narrow range of reef fish, or whether they mainly rely on fishing for subsistence and eat a broader range of fish.

Surround seines can also be set on open schools in a lagoon in the same manner as a beach seine. This fishing method is employed in Hawaii to catch schools of big-eye scad or *akule*, which are located by spotting from light aircraft. This method of fishing is extremely selective, bycatch results when not all the captured school is kept and excess fish will be released. In such cases the release of fish is commendable since they are not wasted as dead bycatch.

Lastly, cast or throw nets are also common in parts of the Pacific, where fishermen want to make modest catches, usually of small nearshore schooling reef species. These catches are taken mainly for subsistence, and fishermen will select and stalk on foot schools of fish such as surgeonfish, herrings, rabbitfish, and mullets in the hope of obtaining a catch (Dalzell *et al*. 1996). As with spearfishing, there is a high degree of selectivity in the target catch, so bycatch is negligible.

2.3.5 Pelagic Fishery

Hawaii's pelagic fisheries are small in comparison with other Pacific pelagic fisheries, but 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 by Hawaii residents and support popular recreational fisheries.

The longline fleet has historically operated in two distinct modes based on gear deployment: deep-set longline by vessels that target primarily tuna and shallow-set longlines by those that target swordfish or have mixed target trips including albacore and yellowfin tuna. Swordfish and mixed target sets are buoyed to the surface, have few hooks between floats, and are relatively shallow. These sets use a large number of lightsticks since swordfish are primarily targeted at night. Tuna sets use a different type of float placed much further apart, have more hooks per foot between the floats and the hooks are set much deeper in the water column. These sets must be placed by use of a line shooter to provide slack in the line which allows it to sink.

The longline fishery accounted for the majority of Hawaii's commercial pelagic landings (17.3 million lb) in 2003. The fleet includes a few wood and fiberglass vessels, and many newer steel longliners that were previously engaged in fisheries off the U.S. mainland. None of the vessels are over 101 ft in length and the total number is limited to 164 vessels by a permit moratorium. Longline fishing is prohibited with 50 nm of the NWHI (56 FR 522214 October 18, 1991) which corresponds to the boundaries of the proposed NWHI sanctuary.

The Hawaii-based skipjack tuna, or *aku* (skipjack tuna) fishery, is also known as the pole-and-line fishery or the bait boat fishery because of its use of live bait. The *aku* fishery is a labor-intensive and highly selective operation. Live bait is broadcast to entice the primary targets of skipjack and juvenile yellowfin tuna to bite on lures made from barbless hooks with feather skirts. Tuna are hooked on lines and in one motion swung onto the boat deck by crew members. The aku fishing fleet has declined from a maximum of 32 vessels in the 1950s to only 2-3 vessels. In 2003 this fleet landed about 700,000 lbs of fish (Table 23).

Pelagic handline fishing is used to catch yellowfin and bigeye tunas with simple gear and small boats. Handline gear is set below the surface to catch relatively small quantities of large, deep-swimming tuna that are suitable for *sashimi* markets. This fishery continues in isolated areas of the Pacific and is the basis of an important commercial fishery in Hawaii (Table 23). Three methods of pelagic handline fishing are practiced in Hawaii, the *ika-shibi* (nighttime) method, the *palu-ahi* (daytime) method and seamount fishing (which combines both handline and troll methods).

Troll fishing is conducted by towing lures or baited hooks from a moving vessel, using big-game-type rods and reels as well as hydraulic haulers, outriggers and other gear. Up to six lines rigged with artificial lures or live bait may be trolled when outrigger poles are used to keep gear from tangling. When using live bait, trollers move at slower speeds to permit the bait to swim "naturally." The majority of Hawaii-based commercial troll production is generated by part time fishermen; however, some full-time commercial trollers do exist.

The total volume of pelagic fish caught annually from the NWHI by the commercial pelagic handline and troll fishery amounts about 450,000 lbs (Reginald Kokubun, Hawaii Division of Aquatic Resources, pers comm.), comprising principally yellowfin tuna and wahoo. Total pelagic fish catches in Hawaii, from commercial and recreational fishing amount to about 33 million lbs, of which the NWHI amount to about 1.4 percent. Yellowfin biomass in the Central and Western Pacific is currently estimated to lie between 1.5 and 3.1 million mt (Hampton et al, 2004). The total volume of yellowfin caught annually from the NWHI by the commercial mixed handline and troll fishery amounts about 170,000 lbs (77 mt) (Reginald Kokubun, Hawaii Division of Aquatic Resources, pers comm.), or 0.003-0.005 percent of the biomass.

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.

The recreational fleet primarily employs troll gear to target pelagic species. Although their motivation for fishing is recreational, some of these vessel operators sell a portion of their landings to cover fishing expenses and have been termed "expense" fishermen (Hamilton 1999). While some of the fishing methods and other characteristics of this fleet are similar to those described for the commercial troll fleet, a survey of recreational and expense fishermen showed substantial differences in equipment, avidity and catch rates compared to commercial operations. Vessel operators engaged in subsistence fishing are included in this recreational category.

Because there are no state or federal permit or reporting requirements for Hawaii's fisheries, little is known about the scale of recreational fishing activities in the NWHI. A charter vessel operation was maintained at Midway Atoll by an eco-tourism operator, but this activity terminated in 2002. Some long range charter operators may be interested in fishing in the NWHI (David Itano, University of Hawaii pers comm.) where competition for pelagic fish is several orders of magnitude lower than in the Main Hawaiian Islands.

Table 23: Fishery Information for Hawaii's Non-longline Pelagic Fisheries for 2002
(Source: WPRFMC, 2004b)

Gear/Vessel Type	Troll/Handline	Pole-and-line Fishery (*Aku* Fishery)
Area Fished	Inshore and EEZ	Inshore and EEZ
Total Landings	3.4 million pounds	696,000 pounds
Catch Composition	48 percent yellowfin 18 percent mahimahi 10 percent wahoo 8 percent albacore 7 percent blue marlin	99.6 percent skipjack tuna <1 percent <1 percent <1 percent <1 percent
Season	All year	All year
Active Vessels	1455	6
Total Permits	NA	NA
Total Trips	18,700	198
Total Ex-vessel Value	$8 million	$1.1 million

Bycatch and Non-target Species

There is little bycatch in Hawaii's non-longline pelagic fisheries. In the NWHI, fishers primarily are trolling for uku, mahimahi, ono, or handlining for ahi. The gear and bait methods practiced are highly selective. For the most part, non-target species caught in these fisheries on such gears are often marketable and thus, would not be discarded.

2.4 Regional Economy and Society

The State of Hawaii lies 2,500 miles southwest of North America, the nearest continental land mass. The eight main islands are part of a 137-island archipelago stretching 1,523 miles from Kure Atoll in the northwest to the island of Hawaii in the southwest. The total land area of the archipelago is 6,423 square miles. The main islands include Oahu, Maui, Kauai, Niihau, Hawaii, Molokai, Kahoolawe and Lānai. Hawaii was established as a territory of the United States in 1900 and became the 50th state in 1959.

2.4.1 Overview of the Economy

Income generation in Hawaiʻi is characterized by tourism, federal defense spending and, to a lesser extent, agriculture (Table 24). Tourism is by far the leading industry in Hawaiʻi in terms of generating jobs and contributing to gross state product. The World Travel and Tourism Council (1999) estimates that tourism in Hawaiʻi directly generated 134,300 jobs in 1999. This figure represents 22.6 percent of the total workforce.

For 2002, DBEDT estimates that direct and indirect visitor contribution to the state economy was 22.3 percent. A bit less than half of that (10.2 percent) was generated in Waikiki. Total visitor expenditures in Hawaii were $9,993,775,000. Tourism's direct and indirect contribution to Hawaii's Gross State Product in 2002 was estimated at $7,974,000,000, or 17.3 percent of the total. Directly and indirectly, tourism accounted for 22.3 percent of all civilian jobs, and 26.4 percent of all local and state taxes.

Department of Defense expenditures in Hawaii in 2002 were $4,293,459,000. Defense expenditures in Hawaii are expected to increase significantly in the near future. These expenditures fall into two broad categories: monies for the pending arrival of the Stryker force, which requires changes in facilities and additional facilities; and the renovation of old military housing as well as the construction of new military housing. As of late July 2004, Hawaii is expected to receive $496.7 million in defense-related spending. When combined with funds earmarked for construction that are contained in a measure before the Senate, Hawaii stands to receive more than $865 million in defense dollars, which do not include funds for day to day operations or payroll (Inouye 2004).

Agricultural products include sugarcane, pineapples (which together brought in $269.2 million in 1997), nursery stock, livestock, and macadamia nuts. In 2002, agriculture generated a total of $510,672,000 in sales. Agricultural employment decreased from 7,850 workers in 2000 to 6,850 in 2003. This change may be due to the increasing use of lots zoned for agriculture for construction of high-end homes, a trend which is evident throughout the state.

Median household income in Hawaii was calculated to be $40,827 in 1990, rising to $49,820 in 1999. Statewide per capita income in 1989 was calculated to be $15,770, rising to $25,684 in 1995 and $27,544 in 1999. The figure for 2002 is $30,040, or 97 percent of the national average. Hawaii per capital income as a percentage of the national average figure has fallen steadily since 1970 (DBEDT 2003). The poverty rate in Hawaii grew more over the 1990s than in the nation as a whole. Despite this growth, Hawaii's poverty rate, which increased from 11.2 percent in 1988-89 to 12.4 percent in 1997-98, remained lower than the national rate (13.0 percent in 1997-98). In 1999, 8 percent of Hawaii's families were below poverty level, compared to 9 percent nationally according to the 2000 Census. Hawaii employment growth was virtually nil for most of the 1990s, continuing through to the end of 1998. Civilian employment has decreased from 411,250 in 1991 to 396,050 in 2002, which is a decrease from 98 percent of all civilian labor force having employment, to 96 percent.

Table 24: Statistical Summary of Hawaii's Economy 1995-1999, 2002

Source: DBEDT 1999, 2002; BOH 1999a

CATEGORY	UNITS	1995	1996	1997	1998	1999	2002
Civilian Labor Force	Number	576400	590200	592000	595000	594800	582200
Unemployment	Percent	5.9	6.4	6.4	6.2	5.6	4.2
Gross state product in 1996 dollars	$ Millions	37963	37517	37996	38015	38047	38,839 (2001)
Manufacturing Sales	$ Millions	2045	1724.1	1468.8	NA	NA	NA
Agriculture (all crops and livestock)	$ Millions	492.7	494.6	486.5	492.6	512992	510672
Construction completed	$ Millions	3153.3	3196.4	2864.9	NA	NA	NA
Retail sales	$ Millions	15693	16565	16426	NA	NA	NA
Defense expenditures	$ Millions	3782.5	3883.5	4074.9	4103.7	4174.2	4293459

For several decades Hawaii benefited from the strength of regional economies around the Pacific that supported the state's dominant economic sector and principal source of external receipts – tourism (BOH 1999a). In addition, industries of long-standing importance in Hawaii, such as the federal military sector and plantation agriculture, also experienced significant growth. However, Hawaii's economic situation changed dramatically in the 1990s. The state's main tourist market, Japan, entered a long period of economic malaise that caused the tourism industry in Hawaii to stagnate. The post-Cold War era brought military downsizing. Tens of thousands of acres of plantation lands, along with downstream processing facilities, were idled by the end of the decade due to high production costs. Employment in Hawaii sugar production fell by 20 percent between 1990 and 1993 and by an additional 50 percent from 1994 to 1995 (Yuen et al. 1997). Net out-migration became the norm in Hawaii, notwithstanding the state's appeal as a place to live. In 1998, the state-wide unemployment rate was 6.2 percent, and unemployment on the island of Molokai reached 15 percent (DBEDT 1999).

By 2002, an improving economy showed a statewide unemployment rate of 4.4 percent, with Molokai down to 8.6 percent (DBEDT 2003). Despite downswings in tourism in the last few years due to the events of 9/11, the SARS scare, Japanese economic issues, and world political conditions, tourism in Hawaii is improving to the point that there are fears that there will not be enough hotel rooms to accommodate all the Japanese tourists who want to come for O Bon season in August 2004 (Schafers 2004).

As a consequence of the economic upheaval of the 1990s and the extensive bankruptcies, foreclosures and unemployment, Hawaii didn't enter the period of economic prosperity that many U.S. mainland states experienced. Between 1998 and 2000, Hawaii's tourism industry recovered substantially, mainly because the strength of the national economy promoted growth in visitor arrivals from the continental U.S. (Brewbaker 2000). However, efforts to diversify the economy and thereby make it less vulnerable to future economic downturns have met with little success. The events of September 11, 2001 and their negative effects on travel and tourism have halted Hawaii's short-lived economic recovery. To date, economic development initiatives such as promoting Hawaii as a center for high-tech industry have attracted few investors. It is unlikely that any new major industry will develop in Hawaii in the near future to significantly increase employment opportunities and broaden the state's economy beyond tourism, the military, and construction.

2.4.2 Fishing Related Economic Activities

The harvest and processing of fishery resources play a minor role in Hawaii's economy. The most recent estimate of the contribution of the commercial, charter and recreational fishing sectors to the state economy indicated that in 1992, these sectors contributed $118.79 million of output (production) and $34.29 million of household income and employed 1,469 people (Sharma et al. 1999). These contributions accounted for only 0.25 percent of total state output ($47.4 billion), 0.17 percent of household income ($20.2 billion) and 0.19 percent of employment (757,132 jobs). However, in contrast to the sharp decline in some traditional mainstays of Hawaii's economy such as large-scale agriculture the fishing industry has been fairly stable during the past decade. Total revenues in Hawaii's pelagic, bottomfish and lobster fisheries in 1998 were about 10 percent higher than 1988 revenues (adjusted for inflation) in those fisheries.

Hawaii's commercial fishing sector includes a wide array of fisheries. The Hawaii longline fishery is by far the most important economically in commercial landings, accounting for 73 percent of the estimated ex-vessel value of the total commercial fish landings in the state in 1999 (Table 25). As shown in that table, the NWHI and MHI bottomfish fisheries account for a relatively small share of the landings and value of the state's commercial fisheries.

Another perspective on the role of bottomfish in Hawaii is to compare landings with pelagic, reef fish, and other fish. Table 26 shows the changing patterns from 2000 to 2003 (NMFS, 2004).

Estimates of the economic activity in the various sectors (commercial, charter and recreational) of Hawaii's bottomfish fishery can be obtained from various published data. According to the WPRFMC (1999), for the period 1994-1998, the ex-vessel value of annual commercial landings in the NWHI and MHI bottomfish fisheries averaged about $1,096,200 and $1,625,800, respectively. Based on data collected in a recent cost-earnings study of Hawaii's charter fishing industry (Hamilton 1998), it is estimated that the charter boat fleet earns about $342,675 per year from taking patrons on bottomfish fishing trips. Finally, based on information gathered in a recent cost-earnings study of Hawaii's small boat fishery (Hamilton and Huffman 1997), it is estimated that annual personal consumption expenditures for recreational vessels engaged in bottomfish fishing total about $2,827,096. Recreational vessels are fishing boats that do not sell any portion of their catch.

Table 25: Volume and Value of Commercial Fish Landings in Hawaii by Fishery 1999
Source: Data compiled by PIFSC.

FISHERY	POUNDS LANDED (1,000s)	PERCENT OF TOTAL POUNDS LANDED	EX-VESSEL VALUE ($1,000s)	PERCENT OF TOTAL EX-VESSEL VALUE
Pelagic longline	28,300	75%	47,400	73%
Troll	2,960	8%	4,550	7%
Pelagic handline	2,340	6%	3,950	6%
Aku pole and line	1,450	4%	1,850	3%
MHI bottomfish handline	420	1%	1,300	2%
NWHI bottomfish handline	370	1%	1,210	2%
NWHI lobster trap	260	1%	1,040	2%
All other fisheries	1,650	4%	3,330	5%
Total	37,750	100%	64,630	100%

Table 26: Annual Estimated Commercial Landings in Hawaii (1000 lbs) 2000-2003

YEAR	PELAGIC FISH	BOTTOMFISH	REEF FISH	OTHER FISH
2000	26,763	718	199	957
2001	22,011	660	250	591
2002	22,330	621	345	662
2003	21,993	602	315	661

However, the above values reflect only the direct revenues and expenditures in the various sectors of the bottomfish fishery. They do not take into account that employment and income are also generated indirectly within the state by commercial, recreational and charter fishing for bottomfish. The fishery has an economic impact on businesses whose goods and services are used as inputs in the fishery such as fuel suppliers, chandlers, gear manufacturers, boatyards, tackle shops, ice plants, bait shops and insurance brokers. In addition, the fishery has an impact on businesses that use fishery products as inputs for their own production of goods and services. Firms that buy process or distribute fishery products include seafood wholesale and retail dealers, restaurants, hotels and retail markets. Both the restaurant and hotel trade and the charter fishing industry are closely linked to the tourism base that is so important to Hawaii's economy. A 2004 survey of 24 chefs at Oahu's "white tablecloth" restaurants found that 77% of the chefs reported that bottomfish is on their list of "most desirable fish species" and 43% said that their customers are willing to pay more for Hawaii-caught bottomfish (Coffman 2004). Finally, people earning incomes directly or indirectly from the fishery make expenditures within the economy as well, generating additional jobs and income.

A more accurate assessment of current contributions of the bottomfish fishery to the economy can be obtained using the Type II output, income and employment multipliers calculated by Sharma et al. (1999) for Hawaii's (non-longline) commercial, charter and recreational fishing sectors. Applying these multipliers to an approximation of the final demand in each of the sectors involved in bottomfish fishing, it is estimated that this fishing activity contributes $10.78 million of output (production) and $2.51 million of household income to the state economy and creates the equivalent of 113 full-time jobs (Table 27).[17]

Table 27: Estimated Output, Household Income and Employment Generated by Bottomfish Fishing Activity in Hawaii

FISHERY	SALES ($)	FINAL DEMAND ($)	OUTPUT ($)	HOUSEHOLD INCOME ($)	EMPLOYMENT (JOBS)[1]
NWHI bottomfish fishery					
Commercial vessels[2]	1,096,200	580,986	1,382,747	482,218	25
MHI bottomfish fishery					
Commercial vessels[2]	1,625,800	861,674	2,050,784	715,189	36
Charter vessels[3]	305,664	293,437	760,002	269,962	14
Recreational vessels[4]		2,827,096	6,587,134	1,046,026	38
Total			10,780,667	2,513,431	113

[1] Calculated as full-time jobs. The input-output model assumes that fishing accounts for 20 percent of the employment time of part-time commercial fishermen (Sharma et al. 1999).

17 Several input-output models other than the one used here are available to study economic impacts. The model developed by Sharma et al. (1999) is based on data collected in Hawaii over a number of years, and is believed to be the best available for analyzing Hawaii's fisheries. It should be noted, however, that different practitioners may apply a model in different ways.

[2] Average annual sales estimate for 1994-1998 from WPRFMC (1999).
[3] Sales estimate based on the following assumptions: 199 active vessels; average annual sales of $76,800 per vessel from charter fees and mount commissions; and 2 percent of total sales attributed to bottomfish fishing trips (Hamilton 1998).
[4] Expenditure estimates based on the following assumptions (Hamilton and Huffman 1997; Pan et al. 1999):

Number of recreational boats	2490
Annual number of bottomfish fishing trips	3.81
Average trip costs	84.75
Average fixed costs: apportioned according to ratio of bottomfish fishing trips to total number of trips	213

2.4.3 Hawaii's Population Size and Ethnicity

The 1990 census listed the population of Hawaii as 1,108,229. This figure rose to 1,179,198 in 1995 and to 1,211,537 in 2000. The population increased by a rate of 6.9 percent between 1990 and 1999.

The state of Hawaii is divided into five counties. The county of Maui includes the islands of Kahoolawe, Lānai, Maui and Molokai. The county of Honolulu encompasses the island of Oahu and the Northwestern Hawaiian Islands excluding Midway Atoll. Kauai County consists of the islands of Kauai and Niihau. The population of each county is provided in Table 28.

Table 28: Hawaii Population by County
Source: U.S. Census Bureau

AREA	1990 CENSUS	2000 CENSUS
Hawaii State	1,108,229	1,211,537
Honolulu County, HI	836,231	874,154
Hawaii County, HI	120,317	148,677
Kaua'i County, HI	51,177	58,463
Maui County, HI	100,374	128,094

The 2000 Census redefined the way race is measured in a number of ways, allowing individuals to identify themselves as one race or a combination of races, as well as having a separate classification system for Hispanic or Latino and race. As a result, describing the makeup of Hawaii's population is more complex. Perhaps the most accurate way to describe Hawaii's population is to report the proportions of race alone or in combination with one or more other races. In 2000, 39.3 percent of Hawaii residents described themselves as white, 2.8 percent as black or African American, 2.1 percent as American Indian or Alaska native, 58 percent as Asian, 23.3 percent as Native Hawaiian and other Pacific Islander, and 3.9 percent as some other race. These proportions add up to more than 100 percent because many individuals reported more than one race. Of the 78.6 percent of residents who reported just one race, 24.5

percent listed white, 1.8 percent black or African American, 41.6 percent Asian (including 4.7 percent Chinese, 14.1 percent Filipino, 16.7 percent Japanese, 1.9 percent Korean, and .6 percent Vietnamese), and 9.4 percent Native Hawaiian and or other Pacific islander.

In 1995-1996, Hamilton and Huffman (1997) conducted a survey of small-boat owners who engage in Hawaii's commercial and recreational fisheries, including the troll, pelagic handline and bottomfish handline fisheries. The survey found that the three largest ethnic groups represented in the sample were Japanese (33 percent), mixed with part-Hawaiian (16 percent) and Caucasian (12 percent). Hamilton and Huffman speculated that the high proportion of Japanese and part-Hawaiians in the sample reflects the traditional connections that these two ethnic groups have with the sea. These sociocultural connections are discussed further in the following section.

With specific regard to the NWHI bottomfish fishery, a 1993 survey of 15 owner-operators and hired captains who participate in the fishery found that 87 percent were Caucasian and 13 percent were part-Hawaiian (Hamilton 1994). However, it is likely that the ethnic composition of the deckhands aboard these vessels is much more mixed and reflects the highly diverse ethnic character of the state's total population

2.4.4 Sociocultural Setting

> Blue sampans ride in the harbor at Kewalo
> under the copper brilliance of the sun;
> blue sampans reel and tilt into the trade wind
> on sea-paths traced by the Hawaiian moon;
> blue sampans stagger and rise gallantly out of chasms of sea
> in storms blowing out of the sultry south,
> in hurricanes howling over the barren isles
> far to the north, in a world of wind and foam.
>
> Clifford Gessler/ Tropic Landfall: The Port of Honolulu, 1942, p.267

Over the past 125 years the sociocultural context of fishing in Hawaii has been shaped by the multi-ethnicity of local fisheries. Although certain ethnic groups have predominated in Hawaii's fisheries in the past and ethnic enclaves continue to exist within certain fisheries, the fishing tradition in Hawaii is generally characterized by a partial amalgamation of multi-cultural attributes. An examination of the way in which the people of Hawaii harvest, distribute and consume seafood reveals remnants of the varied technology, customs and values of Native Hawaiians and immigrant groups from Japan, China, Europe, America, the Philippines and elsewhere.

2.4.5 Social Aspects of Fish Harvest

Commercial fishing first became important in the Hawaiian Islands with the arrival of the British and American whaling fleets during the early nineteenth century. The whalers made the islands their provisioning and trading headquarters because of their central location in the Pacific (Nakayama 1987). This trade reached its zenith in the 1850s when more than 400 whaling vessels arrived in Honolulu annually (Shoemaker 1948). European- and American-owned trading concerns, called "factors," were established to service the whalers and gradually became the dominant enterprises in Honolulu. The significance of whaling to Hawaii's economy waned considerably during the late-nineteenth century by which time plantation agriculture centered on sugar and pineapple production had grown in importance. A number of the trading companies that supported the whaling industry, however, adjusted to these economic changes and remained at the heart of Hawaii's industrial and financial structure (Shoemaker 1948).

The introduction of a cash economy into Hawaii and the establishment of communities of foreigners in the islands also led to the development of a local commercial fishery. As early as 1832, it was the custom for fish and other commodities to be sold in a large square near the waterfront in Honolulu (Reynolds 1835). In 1851, the first regular market house for the sale of fishery products was erected (Cobb 1902). The territorial government replaced this market in 1890 with an elaborate structure that Cobb (1902:435) referred to as "one of the best [market houses] in the United States." Other fish markets were established on the islands of Maui and Hawaii. Locally caught bottomfish were in high demand at these markets. In Bryan's (1915) list of seafood preferences by the various "nationalities" in Hawaii, all of the bottomfish species listed (i.e., *hāpuupuu*, *kāhala*, *ōpakapaka* and *uku*) were among the types of fish purchased by all social groups. Bryan (p.371) noted that some of the "snappers" "…may be procured almost every day, there being more than a hundred thousand pounds sold annually in the Hawaiian markets." Jordan and Evermann (1903:240) wrote of *uku*: "This fish is common about Honolulu, being brought into the market almost every day. It is one of the best of food-fishes." *Gindai* is also referred to as "one of our best food fishes" by Brigham (1908:17). Cobb (1902) reported that *ulaula*, *uku* and *ulua* were among the five species of fish taken commercially on all the islands. Titcomb (1972) writes that *ōpakapaka* was one of the most common fish on restaurant menus prior to World War II.

Initially, commercial fishing in Hawaii was monopolized by Native Hawaiians, who supplied the local market with fish using canoes, nets, traps, spears and other traditional fishing devices (Jordan and Evermann 1902; Cobb 1902; Konishi 1930). However, the role that Native Hawaiians played in Hawaii's fishing industry gradually diminished through the latter half of the nineteenth century. During this period successive waves of immigrants of various races and nationalities arrived in Hawaii increasing the non-indigenous population from 5,366 in 1872 to 114,345 in 1900 (OHA 1998). The new arrivals included Americans, Chinese, Portuguese and Filipinos, but particularly significant in terms of having a long-term impact on the fishing industry was the arrival of a large number of Japanese. The Japanese, like the majority of the early immigrants, were contracted to work on Hawaii's sugar cane plantations. When contract terms expired on the plantations many of the Japanese immigrants who had been skilled commercial fishermen from the coastal areas of Wakayama, Shizuoka and Yamaguchi Prefectures in Japan turned to the sea for a living (Okahata 1971). Later, experienced fishermen came from Japan to Hawaii for the specific purpose of engaging in commercial fishing. The bottomfish fishing gear and techniques employed by the Japanese immigrants were slight modifications of those traditionally used by Native Hawaiians.

During much of the twentieth century Japanese immigrants to Hawaii and their descendants were preeminent in Hawaii's commercial fishing industry. The tightly knit communities that the first Japanese immigrants formed both helped ease the transition to American society and retarded the process of acculturation (Tamura, 1994). The Japanese were able to maintain their separate communities in Hawaii more effectively than any other immigrant group. Among those Japanese communities of particular significance were the settlements of commercial fishermen and their families in the Palama, River Street and Kākāāko areas of Honolulu adjacent to the harbor (Lind 1980).

The adherence of Japanese immigrants to traditional cultural practices included Japanese religious observances, and many of the religious activities of communities such as Kākāāko were centered on fishing (Miyasaki 1973). Various traditional Japanese taboos and rituals directed how a new fishing boat was to be launched, when a vessel could leave or return to port, what items could be brought on board a boat and many other aspects of fishing behavior (Hamamoto 1928; Katamoto 1984). Over the years, succeeding generations of fishermen of Japanese ancestry in Hawaii became more "Americanized," but many Japanese fishing traditions persisted. For example, Japanese immigrant fishermen brought from Japan the Shinto practice of building a *jinsha* (shrine) dedicated to a deity such as *Konpira-sama* or *Ebisu-sama* (Kubota 1984; Miyasaki 1973). Today, an *Ebisu jinsha* constructed at Maalaea on the island of Maui during the early 1900s still stands, and fishermen of Japanese ancestry as well as others who share a common bond in fishing continue each year to ceremonially bless individual fishing vessels (Kubota 1984; T. Arine, pers. comm. 2000. Maui *Jinsha*).[18]

In addition to ethnic and community ties, the physical danger of fishing as an occupation also engendered a sense of commonality among fishermen. Describing the captains and crews of the early sampan fleet in Hawaii, Okahata (1971:208) wrote: "It is said that the fishermen were in a clan by themselves and were imbued with a typical seaman's reckless daring spirit of 'death lies only a floor board away.'" The extreme isolation of the NWHI and the limited shelter they offered during rough weather made fishing trips to these islands particularly hazardous. The perils of fishing in the NWHI for bottomfish and other species captured the attention of the public media (e.g., Inouye 1931; Lau 1936), and inspired one individual to compose the poem included in the preface to this section.

As late as the 1970s, the full-time professional fishermen in Hawaii were predominately of Japanese descent (Garrod and Chong 1978). However, by that period hundreds of local residents of various ethnicities were also participating in Hawaii's offshore fisheries as part-time commercial and recreational fishermen. In addition, a growing number of fishermen from the continental U.S. began relocating to Hawaii. Many of the new arrivals came to the islands because declining catch rates in some mainland fisheries had led to increasingly restrictive management regimes.

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[18] In some communities in Japan *Ebisu* is regarded specifically as the god of fishing, farming and commerce (Tokihiko 1983). He is depicted holding a fishing rod in his right hand and a sea bream under his left arm.

Today, the people who participate in Hawaii's bottomfish fishery and other fisheries comprise an ethnically mixed and spatially dispersed group numbering several hundred individuals, although actual numbers are difficult to ascertain. Most are year-round residents of Hawaii, but some choose to maintain principal residences elsewhere. Participants in the bottomfish fishery do not reside together in a specific location and do not constitute a recognizable "fishing community" in the geographical sense of the term. There are a few rural villages in the state where most residents are at least partially economically dependent on fishing for pelagic species (Glazier 1999). In general, however, those who are dependent on or engaged in the harvest of fishery resources to meet social and economic needs do not include entire cities and towns, but subpopulations of metropolitan areas and towns. These subpopulations comprise fishing communities in the sense of social groups whose members share similar lifestyles associated with fishing.

The dispersal of bottomfish fishery participants can be examined by mapping information from relevant fishery license or permit holders. The Hawaii Division of Aquatic Resources (HDAR) administers a register of State of Hawaii commercial marine license holders. State regulations require any person who "takes marine life for commercial purposes," whether within or outside of the state, to first obtain a commercial marine license from HDAR. For a particular vessel this regulation applies to each person aboard (captain or deckhand) who catches or attempts to catch a fish for commercial purposes. Figure 18 shows the distribution of the business or home mailing address zip codes of commercial marine license holders who indicate that their primary fishing gear is bottomfish handline gear. Each of the five larger main islands has significant concentrations of participants.

Another potential source of information on the distribution of participants in the MHI bottomfish fishery is the HDAR list of registered bottomfish fishing vessels. Hawaii Administrative Rule Chap. 13-94 requires any vessel owner who fishes for certain bottomfish species to register their vessels for bottomfish fishing. As of 2002, approximately 2,960 vessels were registered (W. Ikehara, pers. comm. 2002. HDAR). The mailing addresses of the owners of these boats were not mapped, however, as the list contains many individuals who do not actually harvest bottomfish but who registered their vessels in anticipation of a future limited entry program for the MHI bottomfish fishery. There are currently no fees to register a vessel for bottomfish fishing, and many individuals may have registered, not because they intended to enter the bottomfish fishery at this time, but because they wanted to be ensured access to the fishery in the future. Information on the residences of Mau Zone and Ho'omalu Zone limited entry program permit holders is available from the register of permit holders administered by NMFS. The register indicates that eight permit holders reside in various communities on Oahu, three reside in two different communities on Kauai, one resides on Maui, one resides on the island of Hawaii and three have mailing addresses at separate locations on the U.S. mainland.

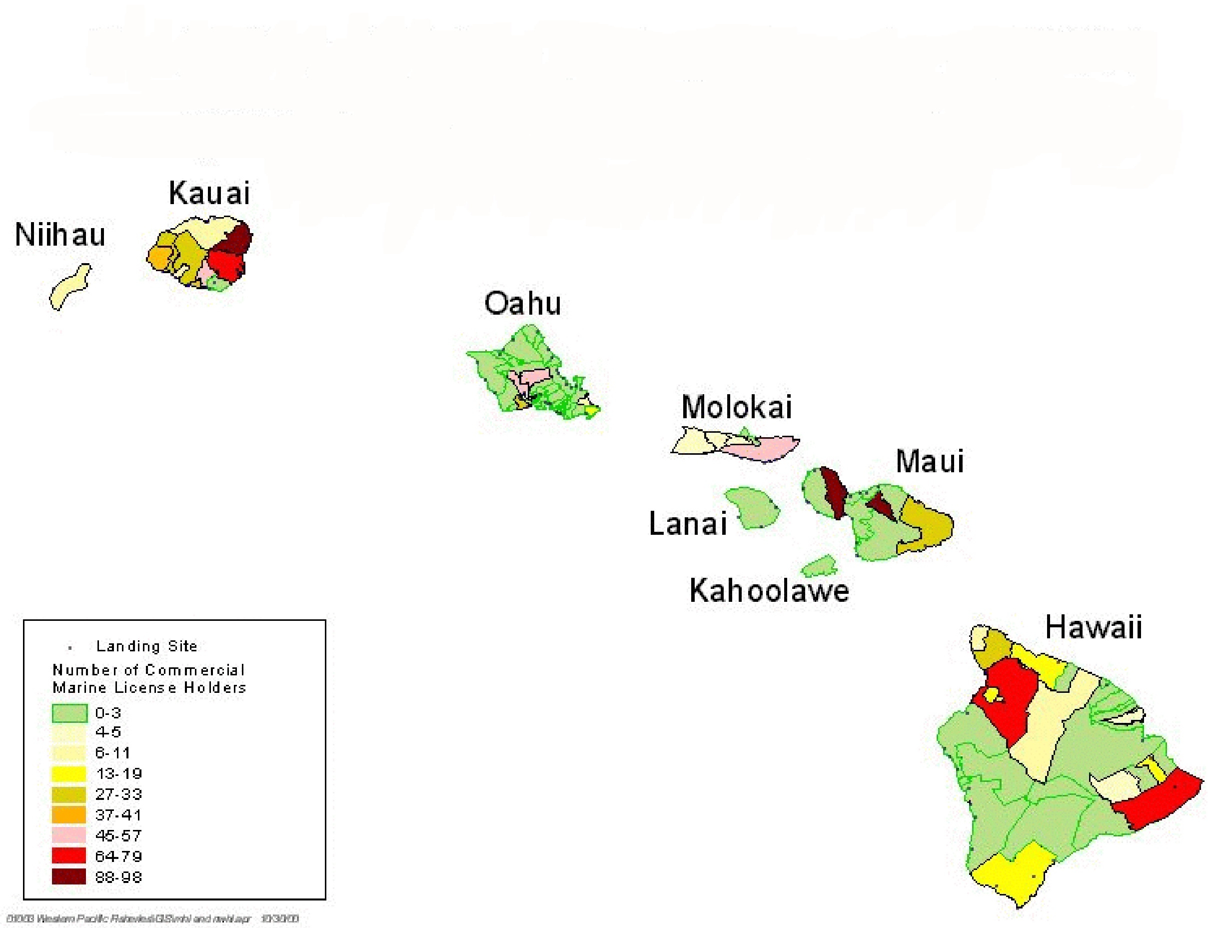

Figure 18: Distribution of Zip Codes of Commercial Bottomfish Participants 1998

Most of the vessels that comprise the NWHI bottomfish fishing fleet utilize harbor facilities at Kewalo Basin, a harbor located in the metropolitan Honolulu area. Three vessels operate from Port Allen Harbor on Kauai. Nearly all of the participants in the NWHI bottomfish fishery reprovision in Honolulu and offload their catch at Kewalo Basin because it is close to the fish auction. In addition, most of the large-volume, restaurant-oriented wholesalers that buy process and distribute fishery products are located in the greater Honolulu area. Businesses whose goods and services are used as inputs in Hawaii's offshore commercial fisheries, such as ice plants, marine rail ways, marine suppliers, welders and repair operations, are similarly concentrated in Honolulu. However, the contribution of the harvesting and processing of fishery resources to the total economic fabric of Honolulu is negligible in comparison to other economic activities in the metropolitan area, such as tourism. In other words, Honolulu is the center of a major portion of commercial fishing-related activities in the state but is not a community substantially dependent upon or substantially engaged in fisheries in comparison to its dependence upon and engagement in other economic sectors.

The bottomfish fishing fleet that concentrates its effort in the waters around the MHI consists mainly of trailered vessels operating from numerous launching facilities scattered throughout the state (Hamilton 1997). The motivations for fishing among contemporary Hawaii fishermen tend to be mixed even for a given individual (Glazier 1999). In the small boat fishery around the MHI the distinction between "recreational" and "commercial" fishermen is extremely tenuous (Pooley 1993a). Hawaii's seafood market is not as centralized and industrialized as U.S. mainland fisheries, so that it has always been feasible for small-scale fishermen to sell any or all of their catch for a respectable price. Money earned from part-time commercial fishing is an important supplement to the basic incomes of many Hawaii families.

It is also important to note that many people in Hawaii who might be considered "commercial" fishermen hold non-fishing jobs that contribute more to their household income than does fishing (Pooley 1993a). For some fishermen non-fishing jobs are not a choice, but a necessity due to the inability to earn an adequate return from fishing. Many participants in Hawaii's offshore fisheries often catch insufficient fish to cover even fuel, bait and ice expenses, but they continue fishing simply for the pleasure of it. Some go so far as to pursue non-fishing occupations that allow them to maximize the time they can spend fishing regardless if it is profitable or not (Glazier 1999).

Fulfillment of social obligations may also at times be an important reason for fishing. Fish are an important food item among many of the ethnic groups represented in Hawaii, especially during various social events. Fishermen are expected to provide fish during these occasions and may make a fishing trip especially for that purpose (Glazier 1999).

Finally, some Hawaii fishermen feel a sense of continuity with previous generations of fishermen and want to perpetuate the fishing life style. The aforementioned 1993 survey of participants in the NWHI bottomfish fishery found that half of the respondents who fish in the Ho'omalu Zone were motivated to fish by a long term family tradition. This sense of continuity is also reflected in the importance placed on the process of learning about fishing from "old timers" and transmitting that knowledge to the next generation. A recent sociocultural survey of small trolling vessel captains in Hawaii found that many of those interviewed either descend from long time fishing families or have worked in fishing or fishing-related work since they were in their teens (Glazier 1999). The average captain had almost 18 years of offshore fishing experience. The survey found that 35 percent of boat captains were taught how to fish by their fathers, grandfathers or uncles, while 32 percent reported being taught by friends (Glazier 1999). Only 14 percent indicated that they taught themselves. Most Hawaii fishermen consider knowledge and experience to be more important factors in determining fishing success than "high-tech" gear. An example of the value placed on information passed down from previous generations of fishermen is the monument that one town on Oahu has recently proposed to commemorate the *kūpuna* (elders) of that area who are recognized for their fishing skills and knowledge (Ramirez 2000).

Whatever the motivations for fishing, the contributions of friends and family members to these efforts are often substantial. Small boat fishing in Hawaii is almost always a cooperative venture involving friends or relatives as crew members (Glazier 1999). In addition, wives, in particular, often play an essential role in shore-side activities such as the transport of fish to markets, purchase of ice, vessel maintenance, bookkeeping and so forth (Glazier 1999).

In Hawaii during the past several years there have been a number of highly publicized clashes between the owners of large and small fishing boats and between fishermen who are newcomers and those who are established residents (Glazier 1999). The reasons for these conflicts are complex, but the perception that the state's marine resources are being damaged and depleted by certain groups of fishermen is a central factor. Fish landing statistics support the notion that catch rates in some fisheries are on the decline. Many fishermen have found that fishing is no longer a profitable enterprise and have dropped out of the industry (Glazier 1999). The situation is aggravated by a depressed state economy that has made it more difficult for many fishermen to find the financial resources to support marginal fishing operations.

In some cases, government regulations have helped alleviate competition among fishermen. In 1991, for example, a longline vessel exclusion zone ranging from 50 to 75 nm was established around the MHI to prevent gear conflicts between large longline vessels and small troll and handline boats. However, government regulations have also added to the level of tension and feelings of frustration among fishermen. For instance, many fishermen in Hawaii have adjusted to natural variations in the availability of various types of fish by adopting a multi-species, multi-gear, highly flexible fishing strategy. However, this strategy is increasingly constrained by the implementation of limited access programs in Hawaii's major commercial fisheries (Pooley 1993a).

Despite this highly competitive and divisive environment fishermen have been able to develop and maintain networks of social relations that foster collaboration and mutual support. For example, fishermen's attempts at organizing to promote their shared interests, whether in the market or lobbying government for changes in policy have generally been fragmented. Nevertheless, some fishermen in Hawaii are represented by a *hui* or organization, and these voluntary associations often facilitate coordination and cooperation for the mutual benefit of their members. A case in point is the Maui Cooperative Fishermen's Association, which is comprised of bottomfish fishermen many of whom are part-timers. The Association negotiates product prices with one or more seafood distributors who, in turn, supply local hotels and restaurants with fresh fish.

Glazier (1999) observed that membership in a Hawaii fishing *hui* can instill a strong feeling of camaraderie and solidarity among fishermen. The cohesion within these organizations constitutes available social capital for both their members and the broader community. For example, fishing clubs often organize or participate in community service projects (Glazier 1999). Examples of more ad hoc forms of cooperation among fishermen are also common. For instance, fishermen may take turns trucking each other's fish from distant landing sites to the central fish auction in Honolulu, thereby reducing transportation costs (Glazier 1999).

Close social relationships also continue to be maintained between some fishermen and fish buyers. For example, small boat fishermen on Kauai and the Kona side of the island of Hawaii tend to sell their catch directly to local buyers who, in turn, sell it to restaurants or retail markets (Glazier 1999). By sending their fish directly to dealers fishermen not only avoid the commission charged by the auction but also enjoy the price stability over the long-term that comes with an established reciprocal relationship. As Peterson (1973) noted, "A fisherman feels that if he is ‘good to the dealer’ in supplying him with fish that he needs to fill his order, ‘the dealer will be good to him’ and give him a consistently fair price for his fish.”

2.4.6 Social Aspects of Fish Distribution and Consumption

Archaeological evidence indicates that seafood was part of the customary diet of the earliest human inhabitants of the Hawaiian Islands (Goto 1986). An early European visitor to Hawaii observed that, “There is no animal food which a Sandwich Islander esteems so much as fish” (Bennett 1840:214). Nineteenth century immigrants to Hawaii from Asia also possessed a culture in which fish was an integral part of the diet. Despite the “exorbitant” fish prices that Hawaii residents have often encountered in the markets, the level of consumption of seafood in the islands has historically been very high. One early commentator noted:

> *In the Honolulu market 2,000,000 pounds of fresh salt water fish valued at $5,000,000 are sold annually. These figures represent a high price for a food that abounds in the waters all around the Islands, yet the people of this community, who are great lovers of the products of the sea, will gratify their tastes even at this expense* (Anon. 1907:17).

Today, per capita seafood consumption in Hawaii is still at least twice as high as the national average (Shomura 1987).

Because seafood was such a significant item in the diets of local residents, the fish markets themselves became important institutions in Hawaii society. Dole (1920:20) noted that the fish market located in the busiest section of Honolulu was more than a commercial establishment, it was also “…Honolulu’s political center where impromptu mass meetings were held …; it was, in a way, a social center also, especially on Saturdays for then business was at its height.” Much of the retailing of fish now occurs through self-service supermarkets, but Honolulu’s fish markets have endured and continue to be centers of social interaction for some island residents.

The fish markets are comprised of retail units the majority of which are single proprietorship-family type operations. Close social connections have developed between retailers and consumers, as the success of the dealers is largely a function of their ability to maintain good relations with their customers and maintain a stable clientele (Garrod and Chong 1978). One journalist wrote of the Oahu Market, where fresh fish and produce have been sold for nearly a century: “In the hustle and bustle of daily life in downtown Honolulu, many people are drawn to Oahu Market because of its informal charm and the feeling of family one gets while shopping there” (Chinen 1984).

Early in the last century Bryan (1915) developed a list of the various fish purchased in the Honolulu market by each of Hawaii’s principal “nationalities.” The ethnic identification of Hawaii’s *kamāina* (long-time residents) with particular species has continued to the present day. The large variety of fish typically offered in Hawaii’s seafood markets reflects the diversity of ethnic groups in Hawaii and their individual preferences, traditions, holidays and celebrations.

Many of the immigrant groups that came to Hawaii brought with them cultures in which fish are not only an integral part of the diet but given symbolic and even transformative connotations. Certain fish communicate messages of solidarity, favor, opulence and the like, or are believed to impart specific desirable traits to the diners (Anderson 1988; Baer-Stein 1999). For example, some types of bottomfish that are red in color have found acceptance within the Japanese community in Hawaii as a substitute for red *tai* (sea bream, *Pagrus major*) – a traditional Japanese symbol of good luck and, therefore, an auspicious fish to be served on festive occasions (HDAR 1979; Shoji 1983). The red color of these fish also symbolizes prosperity and happiness.[19] The December peak in landings of *ōpakapaka*, *onaga*, *kalekale* and *ehu* reflect the demand for them as an important dish in feasts celebrating *Oshogatsu* (Japanese New Year's), considered the most important cultural celebration for people of Japanese ancestry in Hawaii. Serving these fish is also important during non-seasonal events such as wedding and birthday banquets. For Hawaii residents of Chinese descent fish or "*yu*" is an important item during feasts celebrating *Tin nien* (Chinese lunar New Year) and other ritual observances, as it is a homophone for abundance (Choy 1989). Fish also symbolize regeneration and freedom because of their rapid ability to propagate as well as their speed and unconfined lifestyle (Baer-Stein 1999). Fish with white, delicately-flavored flesh are in particularly high demand by the Chinese community during New Year celebrations and other festive occasions (Peterson 1973).

An insistence on quality, as well as quantity and variety, has also long been a hallmark of Hawaii's seafood markets. For example, the Japanese immigrants to Hawaii came from a society in which fishermen, fish dealers and even cooks typically handle prized fish with considerable care (Joya 1985). Hawaii seafood consumers continue to demand fresh fish. Both the discriminating tastes of local residents and the symbolic meaning with which some fish are imbued are linked to the importance of fish as gifts from one person or family to another. In Hawaii various types of high-priced fish such as red snapper are highly regarded as gifts (Peterson 1973). Such sharing and gift giving may play an important role in maintaining social relations, as exemplified by the traditional Japanese obligation to engage in reciprocal exchanges of gifts according to an intricate pattern of established norms and procedures (Ogawa 1973). Those who neglect the obligation to reciprocate risk losing the trust of others and eventually their support.

The sharing of fish among members of the extended family and community is also an early tradition of the indigenous people of Hawaii. The social responsibility to distribute fish and other resources among relatives and friends remains a salient feature of the lives of many Native Hawaiians that is enacted on both a regular basis and during special occasions (Glazier 1999). Among Native Hawaiians fish is considered a customary food item for social events such as a wedding, communion, school graduation, funeral or child's first birthday (baby *lūau*) (Glazier 1999).

19 The reason *tai* is regarded as a celebratory fish among Japanese is thought to be due not only to its beauty of form and color but also because "*tai*" suggests the word "*medetai*," meaning auspicious (Shoji 1983)

2.4.7 Social Significance of Fishing to the Broader Community

Commercial fishing has been part of Hawaii's economy for nearly two centuries. Long-established fishing-related infrastructure in Honolulu such as the fish markets and Kewalo Basin mooring area has helped define the character of the city. Moreover, for some major ethnic groups in Hawaii such as the Japanese and Native Hawaiians the role that their forebears played in the development of commercial fisheries in the islands remains an important part of their collective memory. In 1999, for example, the Japanese Cultural Center of Honolulu organized an exhibition commemorating the past involvement of Japanese in Hawaii's commercial fishing industry.

Given the historical significance of commercial fishing in Hawaii, it likely that some local residents consider the fishing industry to be important in the cultural identity and heritage of the islands. Individuals who have never fished and do not intend to may nonetheless value the knowledge that others are fishing and that this activity is continuing to contribute to Hawaii's social, cultural and economic diversity. This existence value may be expressed in various ways. For example, some individuals may engage in vicarious fishing through the consumption of books, magazines and television programs describing the fishing activities that others are pursuing in the waters around Hawaii.

Just as Hawaii's fishing tradition is an integral part of the islands' heritage and character, the image of Hawaii has become linked with some types of locally caught seafood. Among the fish species that have become closely identified with Hawaii are bottomfish such as *ōpakapaka* and *onaga*. The continued availability of these seafoods in Hawaii has important implications for the mainstay of the state economy - tourism.[20] Many Japanese tourists visiting Hawaii want to enjoy the traditional foods and symbols of prosperity of Japan while they vacation in Hawaii, including various types of high quality fresh fish (Peterson, 1973). Hawaii tourists from the U.S. mainland and other areas where fish is not an integral part of the customary diet typically want to eat seafood because it is perceived as part of the unique experience of a Hawaii vacation. For both Japanese and U.S. mainland tourists, the experience of consuming fish in Hawaii may be enriched if the fish eaten is actually caught in the waters around Hawaii. Suryanata (2000) observes that markets within the state for "grown in Hawaii" products have expanded in the past decade through the proliferation of gourmet restaurants that feature "Pacific Rim" and "Hawaii Regional Cuisine." This marketing strategy eschews traditional symbols constructed by the tourism industry in favor of inciting an appreciation of the social relationships and physical environment that make Hawaii a unique place.

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20 Suryanata (2000) notes that many attributes of Hawaii have been constructed in the marketing of Hawaii by the tourist industry, and unusual or exotic food complements the marketed image. In describing the current initiative to revive Hawaii's agricultural sector by diversifying into high-value non-traditional export crops, such as tropical flowers, gourmet coffee and tropical speciality fruits, she writes "None of these products is unique to Hawaii in a true sense to merit a higher price, but marketing strategies seek to define a strong place-association of these products with Hawaii, to capitalize on Hawaii's exotic image and to develop niche markets for speciality products from paradise." This statement is equally true for locally-produced seafood sold in Hawaii.

Suryanata (2000) also notes that place-based speciality food can retain its appeal to buyers beyond a vacation period or even attract buyers who have never been to the place in question. Just as a consumption of organic food may signify a commitment to a certain environmental and social value, a consumption of products from Hawaii can symbolize a partial fulfillment of a desire to experience or relive a Hawaii vacation. According to a national seafood marketing publication, the power of this constructed value to influence prospective buyers has not been lost on Hawaii's seafood dealers:

> *When it comes to selling seafood the Hawaiians have a distinct advantage. Their product comes with built-in aloha mystique, and while they've emphasized the high quality of the fish taken from their waters, they've also taken full advantage of the aura of exotic Hawaii itself in promotion on the mainland and, now, in Europe* (Marris, 1995).

Local production of food as opposed to a reliance on imports also creates opportunities to foster social connections between consumers and their food producers. As noted above, much of the retailing of fish in Hawaii now occurs through supermarkets, and a large quantity of the seafood sold is imported. However, there still exists in Hawaii personal connections between consumers and the individuals who harvest and retail fish. Such connections may have broad public value. For example, a recent article by agricultural researchers identified proximity as one of the key attributes of a sustainable food system:

> *A sustainable food system is one in which "food is grown, harvested, processed, marketed, sold, [and] consumed as close to home as possible." An emphasis on locally grown food, regional trading associations, locally owned processing, local currency, and local control over politics and regulation is found within a proximate system. A proximate food system will have "grocery stores close to home which carry local items with little or no corporately owned products to compete," and would provide "specialty items that characterize the bioregion"* (Kloppenburg et al. 2000:182).

2.4.8 Native Hawaiian Community

Mai Kīnohi Mai **(From the Very Beginnings)**

The foundation of a people's culture is often revealed in the stories told about their origins. Native Hawaiians define their relationship to the *āina* (land) as the relationship between younger sibling (*poe Hawaii* - Native Hawaiians) and elder sibling (*āina*) both of whom were descended from *Papa* (Earth mother) and *Wākea* (Sky father) (Kameeleihiwa 1992). The relationship of *poe Hawaii* with the ocean was one defined in sacred terms as manifested by the embodiment of the ocean as the realm of *Kanaloa*, one of four primary *Akua* (Divine Beings) in the pantheon of Native Hawaiian *Akua.* The customary and traditional relationship of *poe Hawaii* to the fauna and flora of this oceanic realm was one of *ohana* (family) in which many of the naturally occurring plants and animals (including fish) were regarded as ancestors embodied in temporal form who acted as divine family guardians (Kamakau 1976; Malo 1951).

This spiritual connection was the foundation of the Hawaiian commitment to care for the land and sea and protect them for use by future generations. The understanding of Native Hawaiians in the interdependence of people and the natural resources that sustain them was preserved in the wisdom of *kūpuna* (ancestors) and articulated in *ōlelo noeau* (sayings of wisdom). The following sample of proverbs compiled by Pukui (1983) illustrate the conservation ethic of Native Hawaiians.

E ai i kekahi, e kāpi kekahi.
Eat some now and save some for another time. (#252)

He pono ka pākiko ma mua o ka hookelakela wale aku.
Better to be economical than too liberal. (#912)

Lilo akula ka nui a koe ka unahi.
Most [of the fish] are taken and only the scales are left.
Said after one has taken the “lion’s share” for himself. (#2004)

The Hawaiian sense of stewardship was essential given the dense human population in Hawaii and the islands’ limited natural resources. Estimates of the population of Hawaii prior to European contact vary. An analysis of the Hawaiian population by Stannard (1989) suggests that the population may have approached one million people prior to foreign penetration into the Pacific. Such a large population could also explain how it was that the Native Hawaiian people came to use the area now known as the Northwestern Hawaiian Islands. A population approaching the population that inhabits these islands today would have likely sought to expand its fishing territory as far as possible in order to survive and prosper.

It is part of the historic record that voyages between the MHI and the southern reaches of the NWHI were undertaken on a regular basis. There is also ample evidence that Native Hawaiians were skilled and prolific fishermen both in inshore waters, including the banks near the main islands and extending into the open ocean (e.g., Beckley 1883; Goto 1986; Kahaulelio 1902; Murakami and Freitas 1987; Scobie 1949). It is likely, therefore, that Native Hawaiians frequented the NWHI for ritual and food gathering. Physical evidence found on both Nihoa and Necker islands indicates that Native Hawaiians frequented these islands long enough to build a series of religious temples and agricultural terraces (Emory, 1928).

Evidence of Hawaiian habitation of the NWHI can also be found in the oral traditions of Native Hawaiians. Moses Keale, a recently deceased native of Niihau, related a tradition of Niihauans voyaging to Nihoa for extended periods of time in conjunction with changing weather patterns. These stays were long enough to plant sweet potatoes and harvest those that had been planted on the previous visits. Fish were also caught and preserved for transport back to the MHI (pers. comm. 1980). More recently, in answer to a question regarding extent of the aforementioned voyages, a *kūpuna* (elder) from Niihau stated that these voyages went beyond Nihoa (and possibly Necker) to "*mokupuni palahalaha*" (small flat islands) where one could see from one side of the island to the other (Malaki Kanahele, pers. comm. 2000).

Another example of Hawaiian familiarity with the Northwestern Hawaiian Islands found in the oral record is a section of the story of *Pele* and *Hiiaka* published in the Hawaiian language newspaper *Kūokoa Home Rula* (1911) in which *Pele* recites the wind names of Nihoa.

Na Makani o Nihoa
He Honouli ka makani o Nihoa
He Waialoha ka makani noho ana o Nihoa
He Lupekiikai ka makani kaapuni o Nihoa

Rauzon (2001) suggests that other *mele* (chants) and legends as well as accounts of the navigational assistance that Hawaiians provided to early European explorers indicate that Hawaiians were familiar with many of the NWHI.

Komo Ka Po e Haole (Penetration of Foreigners)

By the time Captain James Cook came upon the Hawaiian Islands in 1778, the sovereign line of Hawaii had persisted for more than 23 generations - or more than 500 years - of a sustained, stable system of governance. In 1810, Kamehameha succeeded in establishing political control over all of the major islands. In order to cope with increasing foreign contacts, the Hawaiian Kingdom began adopting western legal systems such as a parliament, a constitution and treaties with other nations, including several with the United States. However, during the remainder of the century the succession of Hawaiian monarchs that followed Kamehameha were unsuccessful in warding off the increasing encroachment by various colonial powers. In 1883, the Kingdom of Hawaii was overthrown by a group of mostly American businessmen backed by U.S. soldiers (Kuykendall, 1953). The provisional government sought annexation by the United States, and after passage of the "Newlands Resolution" in 1898, Hawaii was considered a territory of the United States.

Today, a fundamental question for many Native Hawaiians and others is the legality of the methods used by the United States to acquire the Hawaiian Islands in the 19th century. In 1993, the U.S. Congress passed the Apology Bill which states that "…the indigenous Hawaiian people never directly relinquished their claims to their inherent sovereignty as a people over their national lands to the United States, either through their monarchy or through a plebiscite or referendum."

In the absence of any treaty or voluntary relinquishment, the lingering sovereign claim by Native Hawaiians may dictate that a higher right to the living marine resources within the U.S. EEZ surrounding the Hawaiian Islands might still be justified. Murakami and Freitas (1987) argue that legal claims of Native Hawaiians to the fishery have not been extinguished by the U.S. government. He notes that, "…Congressional enactments and the 1983 Presidential Proclamation to extend U.S. jurisdiction over mineral resources of the EEZ and the fisheries of the FCZ [200-mile Fishery Conservation Zone] would not affect the viability of this claim in the absence of any treaty or settlement act resolving the potential Hawaiian claim to the fishery, mineral and other natural resources of the FCZ and EEZ around the Hawaiian and Northwest Hawaiian Islands."

Murakami and Freitas (1987:27) summarize the legal aspects of U.S. participation in the conservation of fisheries around the Hawaiian Archipelago in regard to Native Hawaiian claims:

> *The U.S. government has the power to affect the Hawaiian claim to portions of the Hawaiian and Northwestern Hawaiian Island FCZ and EEZ by either: 1) condemning the fisheries granted to Hawaiian commoners and their successors in the FCZ, which will require it to compensate the Hawaiian people for the taking of their fishing grounds; or 2) exercising its public trust duties to protect the aboriginal claims to the resources of the EEZ and FCZ, which will require it to determine what allocation of the revenues it will allow to Hawaiians and what form and extent of participation it will grant to protect the marine environment in which the communal right to fish and gather may take place. The resolution of these issues may have to involve a resolution of the Hawaiian claim for reparations or restitution linked to the 1893 overthrow.*
>
> *The legal uncertainty is rooted in the failure of the U.S. to resolve the potential aboriginal or other claims of Hawaiians for restitution or reparations as a domestic, dependent nation of people, as those of native Americans and Alaska natives have been, or are being resolved. There is ample precedent to support such a claim in Congress. So long as that claim is outstanding, Hawaiians will continue to have a defensible claim to the fishery resources of the FCZ and mineral and other resources of the EEZ.*

The aforementioned Apology Bill stated that:

> *The Congress ...(4) expresses its commitment to acknowledge the ramifications of the overthrow of the Kingdom of Hawaii, in order to provide a proper foundation for reconciliation between the United States and the Native Hawaiian people; and (5) urges the President of the United States to also acknowledge the ramifications of the overthrow of the Kingdom of Hawaii and to support reconciliation efforts between the United States and the Native Hawaiian people.*

Some progress has been made in resolving the Hawaiian claim for reparations or restitution linked to the 1893 overthrow. In December 1999, a series of reconciliation hearings attended by federal representatives, Native Hawaiians and the general public was conducted in Hawaii. In addition, in July 2000, Hawaii's congressional delegation introduced a bill to express the policy of the United States regarding the United States' relationship with Native Hawaiians, to provide a process for the reorganization of a Native Hawaiian government and the recognition by the United States of the Native Hawaiian government.

As these reconciliation efforts proceed, it is also likely that clarification of rights will be an outgrowth of litigation in the courts. The Hawaii Supreme Court, for example, has addressed the nature of certain Hawaiian traditions and customs in a number of cases where it had been asked to address the protection of traditional and customary practices under state law. Most recently, in *Public Access Shoreline Hawaii v. Hawaii County Planning Commission*, 79 Hawaii 425, 903 P.2d 1246 (1995), the court emphasized the obligation of a state agency to preserve and protect Native Hawaiian rights. In its consideration of an action by the Hawaii Planning Commission arising under the Coastal Zone Management Act, the court concluded that the legitimate customary and traditional practices must be protected to the extent feasible in accordance with Article XII, Section 7 of the state constitution and that the state does not have the unfettered discretion to regulate the rights of ahupuaa tenants out of existence.[21] The court reiterated that the Native Hawaiian rights protected by the state constitution may extend beyond the *ahupuaa* in which a Native Hawaiian resides. Moreover, the rights remain intact "...notwithstanding arguable abandonment of a particular site, although this right is potentially subject to regulation in the public interest." Finally, the court went one step further in supporting traditional practices. It said that ancient practices can revive themselves and still have legal authority. In the words of the court, "...continuous exercise is not absolutely required to maintain the validity of a custom."

Socio-economic Conditions of Native Hawaiians

At present, people of Native Hawaiian ancestry comprise about 21 percent of Hawaii's population (DBEDT 1999). By most statistical measures, they have the lowest incomes and poorest health of any ethnic group in the state. Native Hawaiians have long been among the most economically disadvantaged ethnic or racial group in Hawaii in terms of standard of living, degree of unemployment, dependence on transfer payments and limited alternative employment opportunities. In recent years, Native Hawaiians have had the highest proportion of individuals living below the poverty line. In 1989, 6 percent of all the families in the state had incomes classified below the federal poverty level (OHA 1998). During the same period, 14 percent of Native Hawaiians were below the poverty line. Nearly 15 percent of Native Hawaiian households receive public assistance income, compared to 6.8 percent of households in the State (OHA 1998). In several residential areas over a third of Native Hawaiian households receive public assistance.

For centuries Native Hawaiians relied on seafood as their principle source of protein. However, the availability of many traditional seafoods has been significantly diminished. Overfishing and ecological degradation of inshore areas by pollution has had a pronounced negative impact on Native Hawaiian marine subsistence practices. Shomura (1987), for instance, notes that between 1900 and 1986, the harvest of coastal fish species in Hawaii declined by 80 percent, and catches of neritic-pelagic species declined by 40 percent. The changes in diet that resulted from loss of

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21 Article XII, Section 7 of the Hawaii Constitution states: "The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupuaa* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights."

access to sea resources have contributed to the poor health of Native Hawaiians. Of all racial groups living in Hawaii, Native Hawaiians are the group with the highest proportion of multiple risk factors leading to illness, disability and premature death (Look and Braun 1995).

As noted earlier, there is abundant historical and archaeological evidence of the social importance of fishing in traditional Hawaiian culture. With specific regard to bottomfish, this significance was of both an economic and ritual nature (Iversen et al. 1990). Bottomfish such as *kāhala*, *ulua* and *ulaula* (*onaga*) are specifically mentioned in traditional prayers used by fishermen, and fishing for these species was associated with religious rites. The cultural significance of bottomfish species to Hawaiian society is also indicated by the growth stage names for *ōpakapaka*, white *ulua*, *kāhala* and the varietal names for *ulaula* and *uku*.

There may continue to be a strong cultural and religious connection between contemporary Native Hawaiians and certain species of bottomfish (Iversen et al. 1990). Some present day Native Hawaiian consumers of these bottomfish may still associate these fish with traditional beliefs and with their dependence upon the fish for food. Because of the high cost of some bottomfish, they may be frustrated in maintaining such a traditional connection. Industry sources report that Native Hawaiians purchase proportionally less bottomfish than other ethnic groups, possibly because other types of fish cost less, and if Native Hawaiians have less disposable income to spend on fish, they would likely opt to purchase less costly species (Iversen et al. 1990).

3.0 CHAPTER THREE: ALTERNATIVES CONSIDERED

This section describes the alternatives currently being considered as amendments to the Council's Fishery Management Plans. These range from No Action (Alternative 1) to a ban on all fishing within the proposed NWHI sanctuary (see Figure 19) that would take effect five years after the (yet to be determined) sanctuary designation.

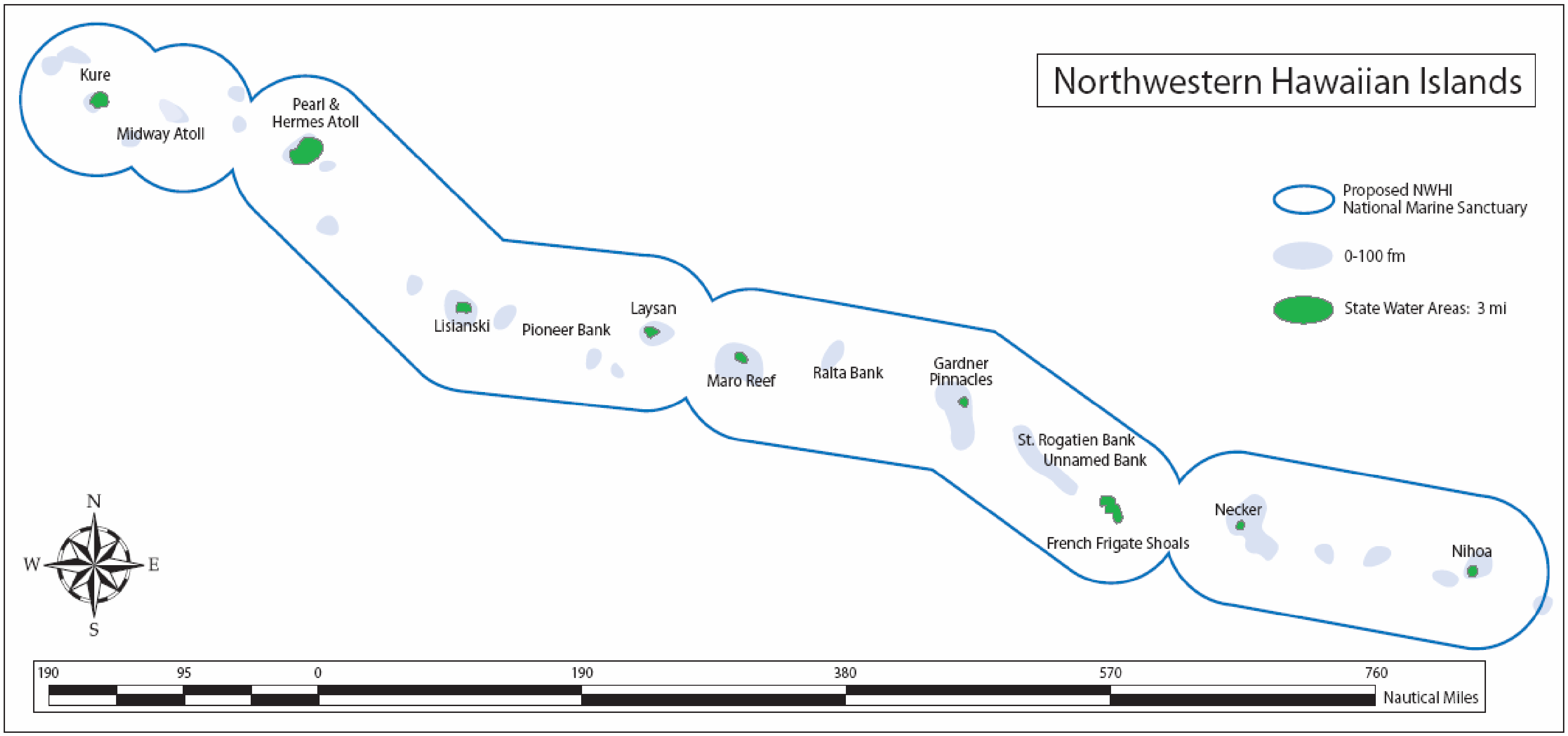


Figure 19: Proposed NWHI Sanctuary

3.1 Alternative 1A: FMP Status Quo (No Action A)

Under this alternative, all NWHI federal fisheries would be conducted according to the existing management measures of the following five FMPs that have been developed, approved, and implemented for the NWHI by the Council NMFS. Please see section 660 of Title 50 of the Code of Federal Regulations for the regulations implementing the following FMPs. Under all alternatives, rules implemented in September 2005 by the State of Hawaii that prohibit all entry (and fishing) within state waters around the NWHI without a special permit would remain in place.

3.1.1 Bottomfish and Seamount Groundfish FMP

The NWHI bottomfish fishery is divided into two sections, the more northern Ho'omalu Zone and the southerly Mau Zone. Each zone is managed under a limited entry program with no more than seven vessels allowed in the Ho'omalu Zone and no more than ten allowed in the Mau Zone. Bottom trawling, nets, poison, explosives and other destructive gears are prohibited. Vessels can be no more than 60 ft in length and vessel captains must attend protected species workshops and carry federal observers if requested by NMFS. Fishing for armorhead is prohibited on the Hancock Seamount while stocks recover from the impacts of foreign fishing prior to the implementation of the Magnuson-Stevens Fishery Conservation and Management Act.

The Bottomfish and Seamount Groundfish FMP was implemented in 1986. It prohibits certain destructive fishing techniques, including explosives, poisons, trawl nets and bottom-set gillnets; establishes a moratorium on the commercial harvest of seamount groundfish stocks at the Hancock Seamounts; and implements a permit system for fishing for bottomfish in the EEZ around the NWHI. (The moratorium on the commercial harvest of seamount groundfish stocks at the Hancock Seamounts, the only exploitable seamount habitat in the management area, remains in effect. At its 123rd meeting (June 21-24, 2004), the Council approved an extension of the moratorium until August 31, 2010 (69 FR 51400). Consequently, there is no seamount groundfish fishery in the region. The plan also establishes a management framework that includes adjustments such as catch limits, size limits, area or seasonal closures, fishing effort limitation, fishing gear restrictions, access limitation, permit and/or catch reporting requirements and a rules-related notice system.

Implemented in 1987, Amendment 1 includes the establishment of potential limited access systems for bottomfish fisheries in the EEZ surrounding American Samoa and Guam within the framework measures of the FMP. Amendment 2 (1988) divides the EEZ around the NWHI into two zones: the Ho'omalu Zone to the northwest and the Mau Zone to the southeast. The amendment also establishes a limited access system for the Ho'omalu Zone. Amendment 3 (1991), which has been supplanted by Amendment 6, defined recruitment overfishing as a condition in which the ratio of the spawning stock biomass per recruit at the current level of fishing to the spawning stock biomass per recruit that would occur in the absence of fishing is equal to or less than 20 percent. Amendment 3 also delineated the process by which overfishing is monitored and evaluated. Amendment 4 (1990) requires vessel owners or operators to notify NMFS at least 72 hours before leaving port if they intend to fish in a 50 nm “protected species study zone” around the NWHI. This notification allows federal observers to be placed on board bottomfish vessels to record interactions with protected species if this action is deemed necessary. Amendment 5 (1999) establishes a limited access system for the Mau Zone and a framework for a Western Pacific Community Development Program. Amendment 6 (1999) identifies and describes essential fish habitat for managed species of bottomfish, discusses measures to minimize bycatch and bycatch mortality in the bottomfish fishery, provides criteria for identifying when overfishing has occurred in the fishery and describes fishing communities in the Region. Amendment 6 initially was only partially approved, with the provisions for bycatch, overfishing and fishing communities in Hawaii disapproved. The disapproved provisions were rewritten and the revised provisions have been implemented. Amendment 7 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Bottomfish and Seamount Groundfish Management Unit Species (BMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also recommended for the NWHI, but all measures recommended in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with Executive Orders 13178 and 13196.

3.1.2 Crustaceans FMP

A limited entry program is in place for the NWHI lobster fishery, with no more than 15 vessels allowed in the NWHI. The fishery is further limited by an annual harvest guideline. Because the majority of fishing occurs around Necker Island, Maro Reef, and Gardner Pinnacles, this harvest guideline is divided into four fishing areas (the fourth is “all other areas”). No harvest guideline has been issued by NMFS for this fishery since 1999, due to uncertainties in the population modeling results. This model calculates the exploitable biomass in each fishing area; managers then determine the annual harvest based on a given risk of overfishing ratio. Through 1999 this ratio indicated that an annual harvest of 13 percent of the exploitable population was associated with a 10 percent risk of overfishing, and these were the harvest and risk levels that were chosen. When an anticipated new model is released by NMFS it may contain a different risk ratio and managers may have to choose a new harvest level to maintain the 10 percent risk level. Fishery participants must use specified traps designed to allow small lobsters to escape, as well as to prevent monk seal entanglement. Federal observers are carried on every vessel and no lobster fishing is permitted within 20 miles of Laysan Island or within 10 fathoms of all other NWHI.

The FMP was implemented in 1983. Initial provisions in the FMP include: a prohibition on fishing for spiny lobster within 20 nm of Laysan Island and within the EEZ landward of the 10 fm curve as depicted on National Ocean Survey Charts Numbers 19022, 19019, and 19016; a minimum size limit; requirements for gear design; prohibitions on retention of ovigerous females; and a mandatory federal logbook and permit program. Since its implementation in 1983, the FMP has been amended ten times. Amendment 1, implemented in 1983, adopted State of Hawaii regulations in the EEZ around the main Hawaiian Islands (MHI). Amendment 2, implemented in 1983, specified trap opening dimensions. Amendment 3, implemented in 1985, clarified definitions for minimum size and tail length. Amendment 4, implemented in 1986, prohibited all lobster fishing in the FMP closed areas in the NWHI. Amendment 5, implemented in 1987, established a minimum size for retained slipper lobsters and required escape panels in traps. Amendment 6, implemented in 1990, defined recruitment overfishing. Amendment 7, implemented in 1991, established a closed season, limited access system and adjustable annual harvest quota. Amendment 8, implemented in 1994, eliminated the "use-it-or-lose-it" landing requirement for permittees. Amendment 9, implemented in 1995, revised the annual harvest guideline and, based on high discard mortality rates, replaced minimum size and condition restrictions in the NWHI with a "retain-all" fishery in which every lobster brought aboard is counted against the annual harvest guideline. Amendment 10, implemented in 1998, identified and described essential fish habitat for crustacean management unit species, discussed measures to minimize bycatch and bycatch mortality, and provided criteria for identifying when overfishing has occurred. In 1998, bank-specific harvest guidelines were established through a framework regulatory measure. The annual harvest guideline represents 13 percent of the exploitable population, which results in a 10 percent chance of overfishing the lobster stock at a particular permit area. In 1999, a process was established by which NMFS is authorized, in consultation with the Council, to allocate the annual harvest guideline among permit subareas (i.e. Necker Island, Gardner Pinnacles and all other NWHI lobster fishing grounds). Amendment 11 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Crustacean Management Unit Species (BMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also recommended for the NWHI, but all measures recommended in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with Executive Orders 13178 and 13196.

3.1.3 Precious Corals FMP

The Precious Corals FMP utilizes a combination of minimum sizes, quotas and other measures to manage potential NWHI harvests of these deep-water species (none have occurred since the Council began managing the fishery in 1983). There are several known beds of precious corals in the NWHI and the use of non-selective gear (such as dredges or tangle nets) is prohibited in all areas.

The FMP was implemented in 1983. The plan established harvest quotas for separate beds, a minimum size limit for pink coral, gear restrictions, area restrictions and fishing seasons. The FMP has been amended four times. Amendment 1, implemented in 1988, applied the management measures of the FMP to U.S. Pacific Insular Areas other than Guam, American Samoa and the Northern Mariana Islands by incorporating them into a single exploratory permit area; expanded the managed species to include any coral of the genus *Corallium*; and outlined provisions for experimental fishing permits. Amendment 2, implemented in 1991, defined a bed as overfished with respect to recruitment when the total spawning biomass (all species combined) has been reduced to 20 percent of its unfished condition. Amendment 3, implemented in 1998, established a framework procedure for adjustment of management measures. Amendment 4, implemented in 1998, identified and described essential fish habitat for managed species of precious corals, discussed measures to minimize bycatch and bycatch mortality in the precious corals fishery and provided criteria for identifying when overfishing has occurred in the fishery.

In 2002 NMFS partially approved a regulatory amendment to the FMP which prohibited the use of non-selective gear to harvest precious corals, defined live and dead corals, established minimum size limits for live pink and black corals, and suspended the harvest of gold coral at Makapu'u Bed. Additional recommendations contained in the regulatory amendment would have revised the boundaries of the NWHI Brooks Bank Bed and reduced its harvest quota for pink coral as well as suspending its quota for gold coral, designate a newly discovered bed at French Frigate Shoals (Gold Pinnacle Bed) as a conditional bed and implement a zero harvest quota for all precious corals at this bed. These recommendations were disapproved by NMFS as inconsistent with Executive Orders 13178 and 13196.

Amendment 5 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Coral Reef Ecosystems Management Unit Species (BMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also recommended for the NWHI, but all measures recommended in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with Executive Orders 13178 and 13196.

3.1.4 Coral Reef Ecosystems FMP

This FMP was developed to manage coral reef ecosystem associated species but was only partially implemented by NMFS. Those measures that would apply to the NWHI were disapproved as potentially in conflict with the NWHI Reserve established by President Clinton as a precursor to sanctuary designation.

The Council completed the Fishery Management Plan for Coral Reef Ecosystems of the Western Pacific Region in October of 2001. On June 14, 2002 NMFS issued a Record of Decision that partially approved the FMP. NMFS disapproved a portion of the plan that governs fishing in the NWHI because of possible conflict and duplication with Executive Orders 13178 and 13196. A final rule implementing the Coral Reef Ecosystem FMP was published on February 24, 2004 (69 FR 8336).

The FMP is the nation's first ecosystem-based plan for fisheries and includes specific measures to promote sustainable fisheries while providing for substantial protection of coral reef ecosystem resources and habitats throughout the Council's jurisdiction. The management measures of the Coral Reef Ecosystems FMP:

1. Establish a network of marine protected areas (MPA) in the Pacific Remote Island Areas (PRIA). Howland, Baker, Jarvis Islands, Rose Atoll and Kingman Reef have been designated as no-take MPAs. Palmyra, Johnston Atolls and Wake Islands are designated as low-use MPAs where fishing is allowed under special fishing permits. Both no-take and low-use MPAs were proposed for the NWHI in the FMP but disapproved by NMFS;
2. Establish a special permit and federal reporting system for controlling and monitoring the harvest of certain coral reef ecosystem MUS for which there is little or no information. Special permits are also required to fish in all areas designated as low-use MPAs. The FMP also uses data collected under existing local reporting systems to monitor the harvest of currently fished coral reef ecosystem management unit species (MUS);
3. Prohibit the use of destructive and non-selective fishing gears;
4. Prohibit harvesting of coral and live rock, but allow limited take under the special permit system for collection of seed stock by aquaculture operations, and religious/cultural use by indigenous peoples;
5. Incorporate an adaptive management approach using a framework process for rapid regulatory modifications in the event of major changes within coral reef ecosystems or coral reef fisheries;
6. Consider and take into account in management, the historical and cultural dependence of coral reef resources by indigenous people and;
7. Identify and prioritize coral reef related research needs for each island area, including socio-economic and cultural research for future potential allocation of resources.

3.1.5 Pelagics FMP

Under the Pelagics FMP, longlining within 50 miles of the NWHI is prohibited but other types of pelagic fishing (trolling, handlining) are allowed. Drift gillnets and shark finning are prohibited.

The Fishery Management Plan for the Pelagic Fisheries of the Western Pacific Region became effective on March 23, 1987. The Pelagic Management Unit Species at that time were billfish, wahoo, mahimahi, and oceanic sharks. The FMP's first measures prohibited drift gillnet fishing within the region's waters of the Exclusive Economic Zone and prohibited foreign longline fishing within certain areas of the EEZ.

Amendment 1 became effective on March 1, 1991 (56 FR 9686, March 7, 1991) and defined recruitment overfishing for each PMUS. It also defined the optimum yield for PMUS as the amount of fish that can be harvested by domestic and foreign vessels in the EEZ without causing local overfishing or economic overfishing.

Amendment 2 became effective on May 26, 1991 (56 FR 24731, May 31, 1991). It implemented requirements for domestic pelagic longline fishing and transshipment vessel operators to have Federal permits, to maintain Federal fishing logbooks, and, if wishing to fish within 50 nm of the Northwestern Hawaiian Islands (NWHI), to have observers placed on board if directed by the National Marine Fisheries Service (NMFS). Amendment 2 also required longline gear to be marked with the official number of the permitted vessel, and incorporated the waters of the EEZ around the Commonwealth of the Northern Mariana Islands into the area managed under the FMP.

Amendment 3, which became effective on October 14, 1991 (56 FR 52214, October 18, 1991), created a 50 nm longline exclusion zone around the NWHI to protect endangered Hawaiian monk seals. This is a contiguous area extending 50 nm from named features in the NWHI and connected by corridors between those areas where the 50-nm-radius circles do not intersect. Amendment 3 also implemented framework provisions for establishing a mandatory observer program to collect information on interactions between longline fishing and sea turtles.

Amendment 4 was effective October 10, 1991 through April 22, 1994 (56 FR 14866, October 16, 1991). It established a three-year moratorium on new entry into the Hawaii-based domestic longline fishery. The amendment also included provisions for establishing a mandatory vessel monitoring system for domestic longline vessels fishing in the Western Pacific Region.
A final rule effective December 15, 1994 (59 FR 58789, November 15, 1994) under Amendment 4 required Hawaii-based longline vessels to carry and use a NMFS-owned vessel monitoring system (VMS) transmitter to ensure that they do not fish within prohibited areas.

Amendment 5 became effective on March 2, 1992 (57 FR 7661, March 4, 1992) and created a domestic longline vessel exclusion zone around the Main Hawaiian Islands (MHI) ranging from 50 to 75 nm, and a similar 50 nm exclusion zone around Guam and its offshore banks. The zones were designed primarily to prevent gear conflicts and vessel safety issues arising from interactions between longline vessels and smaller fishing boats. A seasonal reduction in the size of the closure was implemented in October 1992; between October and January longline fishing is prohibited within 25 nm of the windward shores of all Main Hawaiian Islands except Oahu, where it is prohibited within 50 nm from the shore.

Amendment 6, which became effective on November 27, 1992 (57 FR 48564, October 27, 1992), specified that all tuna species are designated as fish under U.S. management authority and included tunas and related species as Pelagic Management Unit Species under the FMP. It also applied the longline exclusion zones of 50 nm around the island of Guam and the 25-75 nm zone around the MHI to foreign vessels.

Amendment 7 became effective on June 24, 1994 (59 FR 26979, May 25, 1994). It instituted a limited entry program for the Hawaii-based domestic longline fishery with transferable permits, a limit of 164 vessels, and a maximum vessel size of 101' in length overall.

Amendment 8 addressed new requirements under the 1996 Sustainable Fisheries Act (SFA). Portions of the amendment that were immediately approved included designations of essential fish habitat and descriptions of some fishing communities. Those provisions became effective on February 3, 1999 (64 FR 19067, April 19, 1999). Remaining portions that were approved on August 5, 2003 (68 FR 46112) were provisions regarding Hawaii fishing communities, overfishing definitions, and bycatch.

In August 2000, the State of Hawaii enacted a law prohibiting the retention or landing of shark fins without their associated carcasses (a practice called "finning"). Effective March 13, 2002 the Magnuson-Stevens Fishery Conservation and Management Act was amended with a similar nation-wide prohibition (67 FR 6194, February 11, 2002).

Framework Measure 1 became effective March 1, 2002 (67 FR 4369, January 30, 2002) and established an area seaward of 3 nm out to approximately 50 nm around the islands of American Samoa in which fishing for PMUS is prohibited by vessels greater than 50' in length overall that did not land PMUS in American Samoa under a Federal longline general permit prior to November 13, 1997.

Framework Measure 2 became effective June 13, 2002 (67 FR 34408, May 14, 2002) and incorporated the terms and conditions of a November 28, 2000 Biological Opinion issued by the U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act. These measures required Hawaii-based pelagic longline vessel operators to use blue-dyed bait, strategic offal discards, and line shooters with weighted branch lines to mitigate seabird interactions when fishing north of 23° N. Also included was a requirement that all Hawaii-based longline vessel owners and operators annually attend a protected species workshop conducted by NMFS.

Regulatory Amendment 1 to the FMP became effective June 9, 2002 (67 FR 40232, June 12, 2002) and incorporated the reasonable and prudent alternative of a March 2001 Biological Opinion issued by NMFS under section 7 of the Endangered Species Act (this followed and superceded a series of emergency and interim rules issued by NMFS between December 2000 and December 2002 which arose out of litigation activities and are not itemized here). To mitigate interactions with sea turtles, this amendment prohibited shallow set pelagic longlining north of the equator by vessels managed under the FMP and closed waters between 0° and 15° N from April through May of each year to longline fishing. It also instituted sea turtle handling requirements for all vessels using hooks to target pelagic species in the region's EEZ waters. It also extended the protected species workshop requirement to include the operators of vessels registered to longline general permits.

Regulatory Amendment 2 to the FMP became effective October 4, 202 (67 FR 59813, September 24, 2002) and established Federal permit and reporting requirements for any vessel using troll or handline gear to catch PMUS in EEZ waters around the Pacific Remote Island Areas of Kingman Reef, Howland, Baker, Jarvis, Johnston and Wake Islands, and Palmyra and Midway Atolls.

Amendment 10 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Pelagic Management Unit Species (PMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also proposed for the NWHI, but all measures proposed in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with the management regime of the NWHI Coral Reef Ecosystem Reserve. Accordingly, NMFS issued a Record of

Decision on June 14, 2002 that partially approved the Coral Reef Ecosystems FMP and Amendment 10 to the Pelagics FMP. A final rule implementing the Coral Reef Ecosystem FMP (including Amendment 10 to the Pelagics FMP) was published on February 24, 2004 (69 FR 8336).

Regulatory Amendment 3 implements management measures for the longline fisheries managed under the Pelagic FMP, with the objective of achieving optimum yield from these fisheries, without being likely jeopardize the long term existence of sea turtles and other listed species. The amendment established a limited model shallow-set swordfish fishery using circle hooks with mackerel bait. This hook and bait combination has been found to reduce interactions with leatherback and loggerhead turtles by 67 percent and 92 percent respectively in the U.S. Atlantic longline fishery. Fishing effort in the model shallow-set swordfish fishery is limited, in the first instance, to 50 percent of the 1994-1999 annual average number of sets, or just over 2,100 sets, allocated between those fishermen applying to participate in the fishery. As an additional safeguard a 'hard' limit on the number of leatherback (16) and loggerhead (17) turtles that could be taken by the swordfish fishery. In addition the amendment includes a number of conservation projects to protect sea turtles in their nesting and coastal habitats.

Amendment 11 established a limited access system for pelagic longlining in EEZ waters around American Samoa with initial entry criteria based on historical participation in the fishery. The final rule to implement Amendment 11 was published on May 24, 2005 (70 FR 29646).

Regulatory Amendment 4 includes a range of measures to minimize interactions with turtles by non-Hawaii based domestic longline vessels operating in the Western Pacific under general longline permits. Under this amendment, vessels with longline general permits making shallow sets north of the equator are required to use 18/0 circle hooks with mackerel-type bait and dehookers to release any accidentally caught turtles. The amendment also requires both operators and owners of vessels with general longline permits to annually attend protected species training workshops. Further, operators of vessels with general longline permits are required to carry and use specific mitigation gear to aid in the release of sea turtles accidentally hooked or entangled by longlines. These include dipnets, long-handled line clippers and bolt cutters (with allowances for boats with < 3' freeboard). This regulatory amendment also requires operators of non-longline pelagic vessels (e.g., trollers and handliners) to follow handling guidelines and remove trailing gear wherever they fish. The final rule implementing this amendment was published on November 15, 2005 (70 FR 69282).

3.2 Alternative 1B: Reserve Status Quo (No Action B)

Under this alternative, NWHI fisheries would be conducted according to the existing management measures of the above Fishery Management Plans as well as the following non-regulatory measures in place for waters between 3 and 50 miles from emergent NWHI lands which were established by Executive Order 13178 and subsequently amended by Executive Order 13196 as follow:

3.2.1 Executive Order 13178

Sec. 7. *Protection and Conservation Measures.* The conservation measures in this section apply throughout the Reserve.

(a) (1) *Commercial Fishing.* All currently existing commercial Federal fishing permits and current levels of fishing effort and take, as determined by the Secretary and pursuant to regulations in effect on the date of this order, shall be capped as follows:

(A) No commercial fishing may occur in Reserve Preservation Areas pursuant to section 8 of this order;

(B) There shall be no increase in the number of permits of any particular type of fishing (such as for bottomfishing) beyond the number of permits of that type in effect the year preceding the date of this order;

(C) The annual level of aggregate take under all permits of any particular type of fishing may not exceed the aggregate level of take under all permits of that type of fishing in the years preceding the date of this order, as determined by the Secretary, provided that the Secretary shall equitably divide the aggregate level into individual levels per permit, and further provided that the Secretary may make a one-time reasonable increase to the total aggregate to allow for the use of two Native Hawaiian bottomfishing permits;

(D) There shall be no permits issued for any particular type of fishing for which there were no permits issued in the year preceding the date of this order; and

(E) The type of fishing gear used by any permit holder may not be changed except with the permission of the Secretary, as provided under paragraph 3 of this section.

(2) *Recreational Fishing.* All currently existing (preceding the date of this order) levels of recreational fishing effort, as determined by the Secretary and pursuant to regulations in effect on the day of this order, shall be capped (i.e., no increase of take levels or levels of fishing effort, species targeted, or change in gear types) throughout the Reserve. However, fishing is further restricted as provided in section 8 of this order.

(3) The Secretary, after consultation with the Secretary of the Interior and Governor of the State of Hawaii, and after public review and comment and consideration of any advice or recommendations of the Reserve Council and Western Pacific Regional Fishery Management Council, may further restrict the fishing activities under subparagraphs (a)(1) and (a)(2) of this section if necessary to protect Reserve resources, or may authorize or require alternate gear types if such gear would offer equal or greater protection for Reserve resources.

(b) In addition to the conservation measures in paragraph (a) of this section, the following activities are prohibited throughout the Reserve:

(1) Exploring for, developing, or producing oil, gas, or minerals;

(2) Having a vessel anchored on any living or dead coral with an anchor, an anchor chain, or an anchor rope when visibility is such that the seabed can be seen;

(3) Drilling into, dredging, or otherwise altering the seabed; or constructing, placing, or abandoning any structure, material, or other matter on the seabed, except as an incidental result of anchoring vessels;

(4) Discharging or depositing any material or other matter into the Reserve, or discharging or depositing any material or other matter outside the Reserve that subsequently enters the Reserve and injures any resource of the Reserve, except fish parts (i.e., chumming material or bait) used

in and during authorized fishing operations, or discharges incidental to vessel use such as deck wash, approved marine sanitation device effluent, cooling water, and engine exhaust; and
(5) Removal, moving, taking, harvesting, or damaging any living or nonliving Reserve resources, except as provided under paragraph (a) of this section and sections 8(a) and 9 of this order.
c) The Secretary may conduct, or authorize by permit the activities listed in subparagraphs (b)(3)-(5) of this section to the extent that they are necessary for research, monitoring, education, or management activities that further the Management Principles of section 4 of this order.

Sec. 8. *Reserve Preservation Areas.*
(a) To further protect Reserve resources, the following areas are hereby established as Reserve Preservation Areas until some or all are made permanent after adequate public review and comment, within which all activities referred to in paragraph (b) of this section are prohibited.
(1) From the seaward boundary of Hawaii State waters and submerged lands to a mean depth of 100 fathoms (fm) around:
(A) Nihoa Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 10fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(B) Necker Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 20fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(C) French Frigate Shoals;
(D) Gardner Pinnacles, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 10fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(E) Maro Reef, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 20fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(F) Laysan Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 50fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(G) Lisianski Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 50fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(H) Pearl and Hermes Atoll; and
(I) Kure Island.
(2) Twelve nautical miles around the approximate geographical centers of:
(A) The first bank immediately east of French Frigate Shoals;
(B) Southeast Brooks Bank, which is the first bank immediately west of French Frigate Shoals, provided that the closure area shall not be closer than approximately 3nm of the next bank immediately west;
(C) St. Rogatien Bank, provided that the closure area shall not be closer than approximately 3nm of the next bank immediately east, provided further that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue, unless and until the Secretary determines otherwise after adequate public review and comment;

(D) The first bank west of St. Rogatien Bank, east of Gardner Pinnacles;
(E) Raita Bank; and
(F) Pioneer Bank, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue, unlessand until the Secretary determines otherwise after adequate public review and comment.
(b) Activities Prohibited Within Reserve Preservation Areas.
(1) In addition to the conservation measures in section 7 of this order, which are applicable to the entire Reserve, the following activities are prohibited within the Reserve Preservation Areas listed in paragraph (a) of this section, except as expressly otherwise stated in this paragraph and sections (8)(a) and 9 of this order:
(A) Commercial and recreational fishing;
(B) Anchoring in any area that contains available mooring buoys, or anchoring outside an available anchoring area when such area has been designated by the Secretary;
(C) Any type of touching or taking of living or dead coral;
(D) Discharging or depositing any material or other matter except cooling water or engine exhaust; and
(E) Such other activities that the Secretary identifies after adequate public review and comment, and after consideration of any advice and recommendations of the Reserve Council.
(2) Notwithstanding the prohibitions in this paragraph, the Secretary may conduct, or authorize by permit, research, monitoring, education, or management activities within any Reserve Preservation Area that further the Management Principles of section 4 of this order.
(3) The Reserve Preservation Areas in this section are approximated using fathoms. The Secretary will develop straight line boundaries based on longitude and latitude coordinates to encompass each Reserve Preservation Area, to provide for clarity and ease of identification. The Secretary may make technical modifications to any such boundaries.

Sec. 9. *Native Hawaiian Uses.* Native Hawaiian noncommercial subsistence, cultural, or religious uses may continue, to the extent consistent with existing law, within the Reserve and Reserve Preservation Areas identified under section 8 of this order. The Secretary shall work with Native Hawaiian interests to identify those areas where such Native Hawaiian uses of the Reserve's resources may be conducted without injury to the Reserve's coral reef ecosystem and related marine resources and species, and may revise the areas where such activities may occur after public review and comment, and consideration of any advice and recommendations of the Reserve Council.

3.2.2 Executive Order 13196

Sec. 3. *Amendments to Sections 7 of Executive Order 13178.*
1. Section 7(a)(1) of Executive Order 13178 is hereby amended by revising the first sentence to read as follows:
''Commercial Fishing. All currently existing commercial Federal fishing permits and current levels of fishing effort and take, which also includes the non-permitted level of trolling for pelagic species by currently permitted bottom fishers, as determined by the Secretary and pursuant to regulations in effect on December 4, 2000, shall be capped as follows:''
2. Section 7(a)(1)(C) of Executive Order 13178 is hereby revised to read as follows:

‘‘(C) The annual level of aggregate take under all permits of any particular type of fishing may not exceed the aggregate level of take under all permits of that type of fishing as follows:
(1) Bottomfishing—the annual aggregate level for each permitted bottomfisher shall be that permittee’s individual average taken over the 5 years preceding December 4, 2000, as determined by the Secretary, provided that the Secretary, in furtherance of the principles of the reserve, may make a onetime reasonable increase to the total aggregate to allow for the use of two Native Hawaiian bottomfishing permits;
(2) All other commercial fishing—the annual aggregate level shall be the permittee’s individual take in the year preceding December 4, 2000, as determined by the Secretary.’’
3. A new section 7(a)(1)(F) is hereby added to Executive Order 13178 and reads as follows:
‘‘(F) Trolling for pelagic species shall be capped based on reported landings for the year preceding December 4, 2000.’’
4. Section 7(b)(4) is revised to read as follows:
‘‘(4) Discharging or depositing any material or other matter into the Reserve, or discharging or depositing any material or other matter outside the Reserve that subsequently enters the Reserve and injures any resource of the Reserve, except:
(A) fish parts (i.e., chumming materia or bait) used in and during fishing operations authorized under this order;
(B) biodegradable effluent incident to vessel use and generated by a marine sanitation device in accordance with section 312 of the Federal Water Pollution Control Act, as amended;
(C) water generated by routine vessel operations (e.g., deck wash down and graywater as defined in section 312 of the Federal Water Pollution Control Act), excluding oily wastes from bilge pumping; or (D) cooling water from vessels or engine exhaust; and’’.

Sec. 4. *Amendments to Sections 8 of Executive Order 13178.*
1. Section 8 of Executive Order 13178 is modified by substituting ‘‘provided that commercial bottomfishing and commercial and recreational trolling for pelagic species in accordance with the requirements of sections 7(a)(1) and 7(a)(2) of this order, respectively,’’ for ‘‘provided that bottomfishing in accordance with the requirements of section 7(a)(1)’’ everywhere the latter phrase appears in section 8.
2. Section 8(a)(1)(A) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 10fm.’’
3. Section 8(a)(1)(B) is modified by substituting ‘‘a mean depth of 25 fm’’for ‘‘a mean depth of 20fm.’’
4. Section 8(a)(1)(D) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 10fm.’’
5. Section 8(a)(1)(E) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 20fm.’’
6. Section 8(a)(1)(G) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 50fm.’’
7. Section 8(a)(1)(I) is revised to read ‘‘Kure Atoll.’’
8. Sections 8(a)(2)(D) and (E) are hereby deleted and a new section 8(a)(3) is hereby substituted as follows:
‘‘(3) Twelve nautical miles around the approximate geographical centers of

(A) The first bank west of St. Rogation Bank, east of Gardner Pinnacles, provided that commercial bottomfishing and commercial and recreational trolling for pelagic species in accordance with the requirements of sections 7(a)(1) and 7(a)(2) of this order, shall be allowed to continue for a period of 5 years from the date of this order; and
(B) Raita Bank, provided that commercial bottomfishing and commercial and recreational trolling for pelagic species in accordance with the requirements of sections 7(a)(1) and 7(a)(2) of this order, shall be allowed to continue for a period of 5 years from the date of this order; and
(C) Provided that both banks described above in (3)(A) and (3)(B) shall only continue to allow commercial bottomfishing and commercial and recreational trolling for pelagic species after the 5-year time period if it is determined that continuation of such activities will have no adverse impact on the resources of these banks.''

3.3 Alternative 2: Limited NWHI Sanctuary Fishing

Alternative 2 includes three aspects that address each of the regulatory regimes currently under consideration by NOAA for the proposed NWHI sanctuary. The first would allow limited fishing activities within the proposed sanctuary to continue indefinitely, the second would end such fishing by 2025, and the third would end it after five years following the (yet to be determined) effective date of the NWHI sanctuary designation. The first two variations include catch levels and permit limits for the proposed sanctuary. For the five year variation, the number of permits would be limited to those permits active at the time of designation.

Under all three scenarios, NWHI fisheries for crustaceans, precious corals and coral reef associated species would be subject to moratoriums on all harvests within a corridor that is 50 nautical miles from the geographic center of each of individual islands in the NWHI (i.e. throughout the proposed NWHI sanctuary, see Figure 19).

Also under all three scenarios, commercial fishing for NWHI bottomfish would continue to be managed under those limited access programs described in Alternative 1A. NWHI commercial bottomfish fishing permits would be non-transferable and if relinquished by the permit holder, would be reissued without delay by NMFS in accordance with the procedures set forth for the Ho'omalu Zone in Section 660.61 of the Code of Federal Regulations, and for the Mau Zone as described in an amendment to the Bottomfish FMP that has been recommended by the Council to establish a similar process to reissue Mau Zone permits that have been relinquished or revoked. Permit holders would not be subject to minimum landing requirements but would be required to maintain federal MSA logbooks.

Also included in all scenarios is the implementation of eligibility criteria for two Mau Zone limited access permits set aside under the Western Pacific Community Development Program for the use of indigenous communities. These would be allocated and managed as described in an amendment to the Bottomfish FMP that has been recommended by the Council.

Under all three scenarios, commercial fishing for pelagic species would continue to be allowed within the proposed sanctuary by use of trolling or handline hook-and-line gear, with longline, trawls, purse seines, and set nets prohibited. These pelagic fishing vessels would be subject to new federal MSA permitting and logbook requirements.

Finally, under all three scenarios all recreational (i.e. non-commercial) fishery participants within the proposed sanctuary would be subject to new federal MSA permitting and logbook requirements. The one exception would be Midway-based recreational fishing that takes place within a 12 mile circle surrounding Midway Atoll. These operations would be subject to the federal MSA permitting requirement but would otherwise continue to be managed by the U.S. FWS, who would collect fishery monitoring data and share it with NMFS.

3.3.1 Scenario 1: Allow Limited NWHI Sanctuary Fishing Indefinitely

In addition to the measures common to all scenarios that are described above, under Scenario 1 federal MSA catch and permit limits would be implemented for all commercial NWHI fishery participants targeting bottomfish or pelagic species within the proposed NWHI sanctuary.

The number of permits available at any one time for commercial bottomfish fishing would be limited to seven for the Mau Zone (including two CDP permits) and seven for the Ho'omalu Zone. The total fleet-wide catch of bottomfish by these permit holders would be capped at 381,500 pounds per year. Based on the non-confidential data shown in Figure 20, the average annual NWHI catch per vessel by non-longline commercial pelagic fishing vessels over the entire time series is about 5,600 lb per permit, based on the data where both catch and permit data pairs available. Thus this sector's total fleet-wide catch of pelagic fish would be capped at 78,400 pounds per year.

Recreational (i.e. non-commercial) fishery participants would be required to obtain annual federal MSA permits which would be issued on a case-by-case basis for no more than two years at which time the appropriate level of NWHI sanctuary recreational fishing catch and effort would be determined and capped.

A range of options are being considered under this scenario regarding the number of permits and catch limits for commercial non-longline pelagic fishing (by participants other than bottomfish permit holders) within the proposed NWHI sanctuary. These are discussed in Section 3.3.4.

Three options are being considered for the establishment of no-take MPAs in the NWHI under this scenario. These are discussed in Section 3.3.5.

3.3.2 Scenario 2: Allow Limited NWHI Sanctuary Fishing Until 2025

In addition to the measures common to all scenarios that are described above, under Scenario 2 federal MSA catch and permit limits would be implemented for all commercial NWHI fishery participants targeting bottomfish or pelagic species within the proposed NWHI sanctuary.

The number of permits available at any one time for commercial bottomfish fishing would be limited to seven for the Mau Zone (including two CDP permits) and seven for the Ho'omalu

Zone. The total fleet-wide catch of bottomfish by these permit holders would be capped at 381,500 pounds per year. Their total fleet-wide catch of pelagic fish would be capped at 78,400 pounds per year.

Recreational (i.e. non-commercial) fishery participants would be required to obtain annual federal MSA permits which would be issued on a case-by-case basis for no more than two years at which time the appropriate level of NWHI sanctuary recreational fishing catch and effort would be determined and capped.

A range of options are being considered under this scenario regarding the number of permits and catch limits for commercial non-longline pelagic fishing (by participants other than bottomfish permit holders) within the proposed NWHI sanctuary. These are discussed in Section 3.3.4.

Three options are being considered for the establishment of no-take MPAs in the NWHI under this scenario. These are discussed in Section 3.3.5.

Effective December 31, 2024, no fishing of any type would be allowed in the corridor that is 50 nautical miles from the geographic center of each of individual islands in the NWHI (i.e. throughout the proposed NWHI sanctuary, see Figure 19).

3.3.3 Scenario 3: Allow Limited NWHI Sanctuary Fishing for Five Years

In addition to the measures common to all scenarios that are described above, under Scenario 3 the number of permits available at any one time for commercial bottomfish fishing would be limited to those active as of the effective date of the NWHI sanctuary designation.

Commercial and recreational fishing for pelagic species, as well as recreational fishing for bottomfish, would continue to be regulated as described in Section 660 of the Code of Federal Regulations.

Effective five years from the effective date of the final rule implementing the designation of the NWHI sanctuary, no fishing of any type would be allowed in the corridor that is 50 nautical miles from the geographic center of each of individual islands in the NWHI (i.e. throughout the proposed NWHI sanctuary, see Figure 19).

These measures are summarized in Table 29.

Table 29: Summary of Measures for Each Scenario under Alternative 2

Measure	Scenario 1	Scenario 2	Scenario 3
MORATORIUMS			
Moratoriums on crustacean, precious corals and coral reef ecosystem fisheries	X	X	X
COMMERCIAL BOTTOMFISHING			
Cap permits and landings	X	X	
Implement CDP program	X	X	X
Require federal logbooks	X	X	X
COMMERCIAL PELAGIC FISHING			
Cap permits and landings	X	X	
Require federal permits and logbooks	X	X	X
RECREATIONAL FISHING			
Allow case-by-case, cap after two years	X	X	
Require federal permits and logbooks	X	X	X
NO-TAKE MPAS			
Implement no-take MPAs	X	X	

3.3.4 Options for the NWHI Commercial Pelagic Fishery

The following options are being considered under Scenarios 1 and 2 for the commercial non-longline pelagic fishery sector in the proposed NWHI sanctuary. Due to the use of confidential, unpublished fishery landings data in the calculation of some catch and permit limits, some options are necessarily vague in their presentation here.

No Action

Under this option, no new limits would be placed on non-longline commercial pelagic fishing vessels in the proposed NWHI sanctuary and catches would continue to be monitored by the completion of catch reports required of commercial marine license holders by the by the State of Hawaii.

Limit of Three or Less Pelagic Permits, and Total Pelagic Catch of Less Than or Equal to 50,000 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be limited to approximately

50,000 lb or less, and the number of non-longline commercial pelagic fishing vessels would be capped at three or less permits.

Limit of Three or Less Pelagic Permits and Total Pelagic Catch of Less Than or Equal to 70,500 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be limited to approximately 70,500 lb or less, and the number of non-longline pelagic fishing vessel permits would be capped at three or less permits.

Limit of 15 Pelagic Permits and Total Pelagic Catch of 213,635 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be limited to approximately 213,635 lb, and the number of non-longline pelagic fishing vessel permits would be capped at 15 or less permits.

From the long-term data set for non-longline commercial pelagic fishing vessels, the maximum number of these permits operating in the NWHI was 15 in 1987, with a corresponding catch of 213,653 lb. While this alternative does not aspire to closely match the intent of EO 13196, it still places stringent limits on the volume of pelagic fish catches in the NWHI, while being based on historic levels of participation and fishing activity in this section of the Hawaiian Archipelago. Although this level of fishing for pelagic fishes may be higher than contemplated in the EO and by the proposed marine sanctuary, this level of fishing activity appears to have had no impacts on the populations of coral reef associated species in the NWHI. This alternative would allow realistic opportunities for Hawaii-based fishermen to fish for pelagic fishes in the NWHI,

Limit of 7-10 Pelagic Permits and Total Pelagic Catch of 219,386 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary non-longline commercial pelagic fishing vessels would be limited to approximately 219,386 lb, and the number of non-longline commercial pelagic fishing vessel permits would be capped at between 7-10 permits.

Clearly, this option is also markedly less stringent than the intent of EO, but as with the previous option, it is based on historical trends within the NWHI fisheries and incorporates longline catches in terms of non-longline pelagic permit equivalents.

Limit of 22 Pelagic Permits and Total Pelagic Catch of 386,124 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be capped at 386,124 lb, and the number of non-longline pelagic fishing vessel permits would be capped at 22 permits.

Both this and the next option factor in catches by the non-longline pelagic fishing vessels and the equivalent volume of fish represented by longline fishing which occurred historically within the bounds of the proposed marine sanctuary. The average annual longline catch of pelagic fish from the waters of the proposed NWHI sanctuary between 1990 and 1991 amounted to 172,471 lbs.

This option maximizes the potential pelagic catch from the NWHI for non-longline commercial pelagic fishing vessels, by incorporating the historic maximum catch by these vessels and accounting for pelagic longline catch as the equivalent production by the for non-longline pelagic fishing vessels. Clearly, this option is markedly less stringent than the intent of EO, but places pelagic fish catches from the waters of the proposed sanctuary within historical limits, and affords Hawaii fishermen opportunities to target pelagic fish in the NWHI.

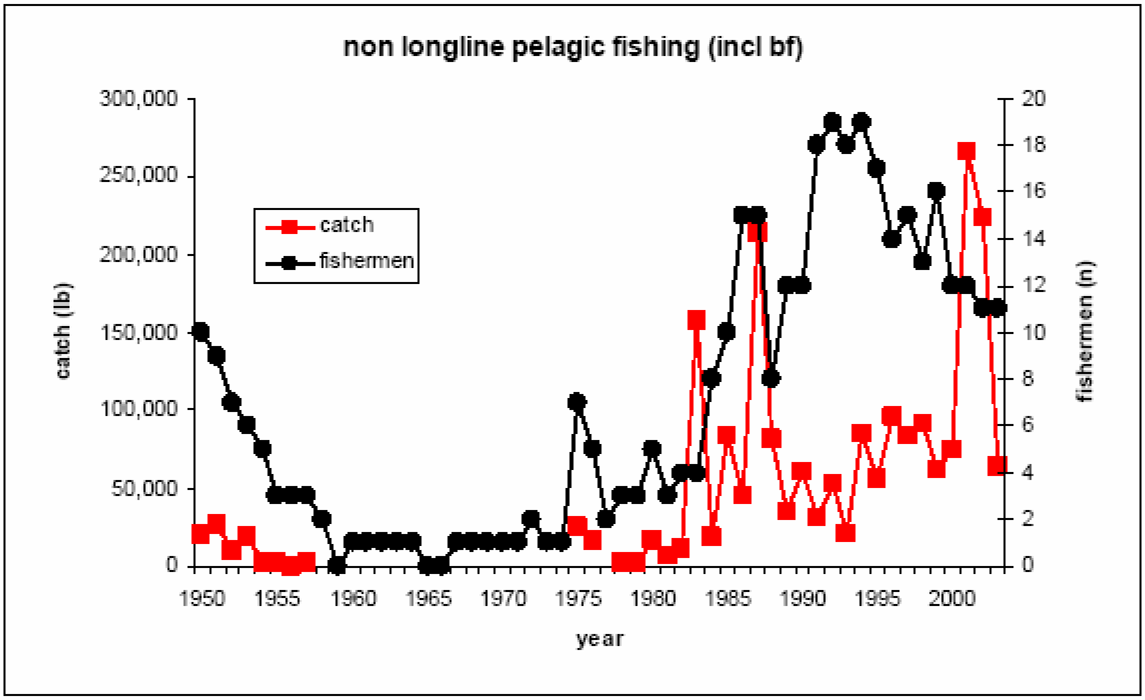
These options are summarized in Table 30:

Table 30: Options for Non-longline Commercial Pelagic Fisheries in the NWHI

Option	Action
1	No action
2	Less than or equal to 3 pelagic permits, and total pelagic catch limit of less than or equal to 50,000 lbs
3	Less than or equal to 3 pelagic permits and total pelagic catch limit of less than or equal to 70,500 lbs
4	Limit of 15 pelagic permits and total pelagic catch limit of 213,653 lb
5	Limit of 7-10 pelagic permits and total pelagic catch limit of 219,386 lb
6	Limit of 22 pelagic permits and total pelagic catch limit of 386,124 lb

These options are based for the most part on data from logbooks and logsheets for Hawaii-based commercial pelagic vessels operating within the proposed sanctuary. The logbook records for the troll/handline fisheries extend from the early 1950s to the present and are collected by the State of Hawaii's Division of Aquatic Resources as one of the requirements for a commercial marine license to fish. By contrast, federal logbooks for the Hawaii-based longline fishery were only implemented in 1990. Although records for the longline fishery extend from 1990 to the present, records of longline fishing within the confines of the proposed 50 nm sanctuary boundary around the NWHI is restricted to 1990 and 1991. This is due to the 50 nm protected species zone from which longliners are excluded and which was implemented by the Council under its Pelagics FMP in late 1991 to avoid the accidental capture of Hawaiian monk seals. The proposed sanctuary conforms exactly to coordinates used to delineate the protected species longline exclusion zone.

A summary of the non-confidential commercial catch data used top develop the alternatives in Table 30 is given in Figures 20 and 21. Figure 20 illustrates NWHI pelagic catches and participants on bottomfish and non-longline pelagic vessels combined (top), and on pelagic fishing vessels only (bottom). Figure 21 illustrates the species composition of NWHI pelagic catches by non-longline pelagic and bottomfishing vessels combined (top), by non-longline pelagic fishing vessels only (middle) and by longline vessels only (bottom). Data for bottomfish and non-longline pelagic vessels extends from 1950 to 2003, and for longliners from 1990 to 1991.



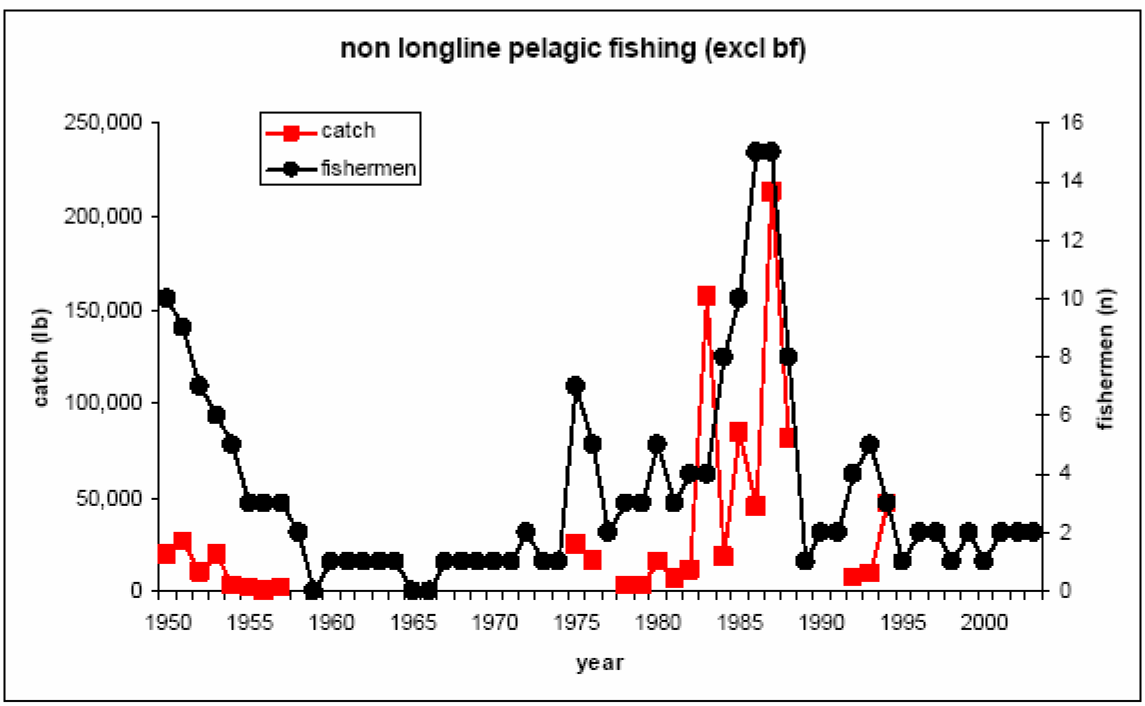


Figure 20: Non-Confidential Catch Records for NWHI Commercial Pelagic Catches

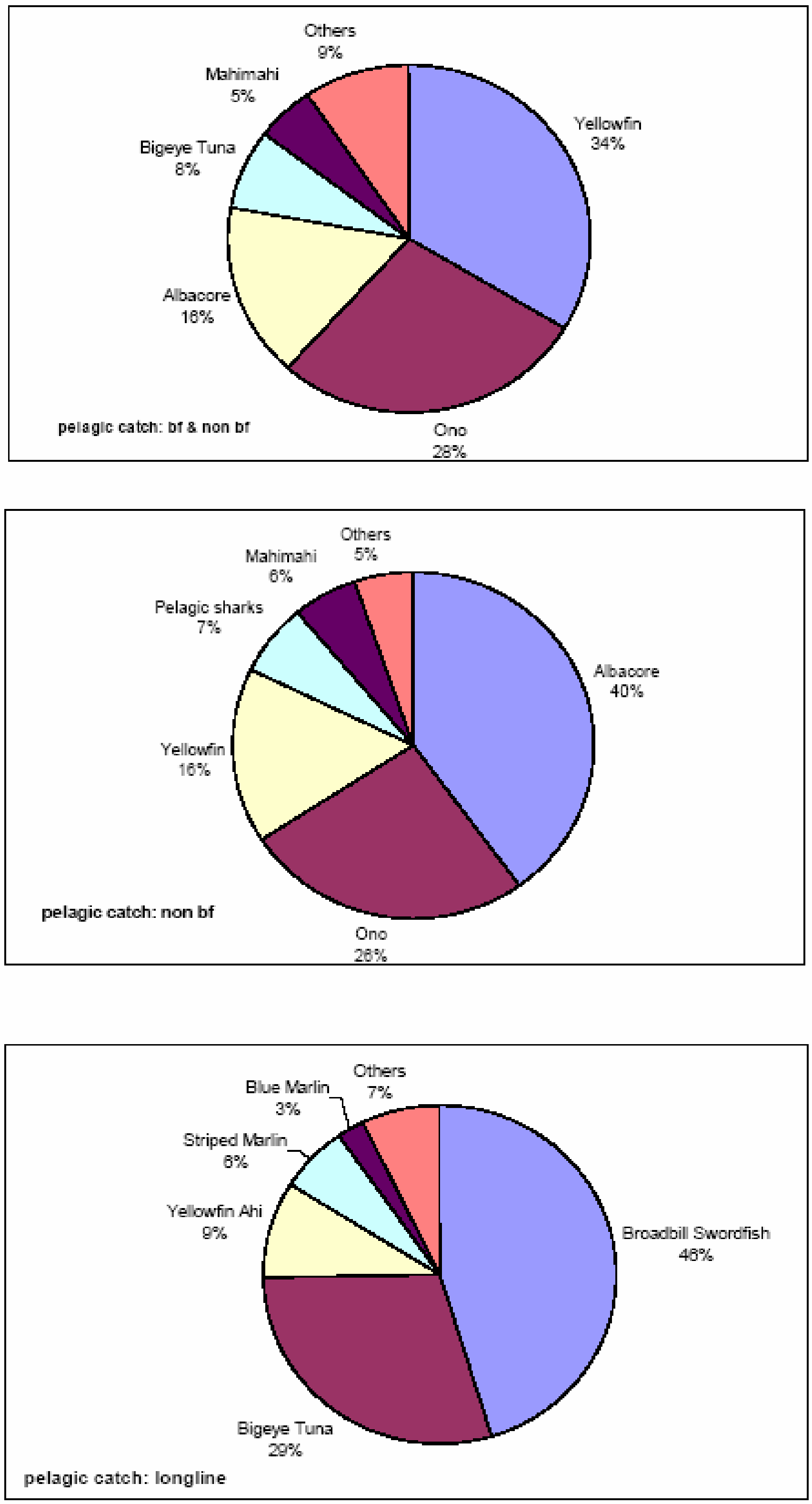


Figure 21: Species Composition of NWHI Commercial Pelagic Catches

The data in Fig. 20 show that the aggregate number of commercial bottomfish and non-longline pelagic fishermen increased markedly after the mid-1970s and reached a peak of about 19 fishermen by the early 1990s with a decline thereafter. Most of this increase was due to bottomfish vessels, apart from a period in the mid-1980s when non-longline pelagic fishermen numbers in the NWHI peaked at 15 fishermen. Numbers since then have been considerably lower, alternating between 1-2 fishermen per year since 1995. Catch composition for commercial pelagic fisheries operating in the NWHI is shown in Figure 21. The combined pelagic catch for bottomfish and non-longline pelagic vessels shows that catches were dominated by yellowfin, ono (wahoo) and albacore tuna, which formed almost 80 percent of catches. The same three species also comprise about 80 percent of the catch composition of non-longline pelagic vessels, although albacore rather than yellowfin is the largest component of the catch. Catches of albacore by the non-longline pelagic vessels is not evenly distributed through the records form the non-longline pelagic fishing vessels, and the dominance of this species in the data is due to large catches of this species in 1983, 1985 and 1987, with no other landings reported in any of the other years. The catch composition for the longline fishery is dominated by swordfish, which forms almost 50 percent of the catch, followed by bigeye tuna and yellowfin tuna, and reflects the targeting of the longline fishery for these species, fishing shallow for swordfish or deep for bigeye tuna.

It is important to note that the data discussed in the previous sections, although extensive, is incomplete for a number of years due to confidentiality protocols for catches by less than three fishing entities. his makes interpretation of the data for non-longline pelagic fishing vessels somewhat difficult, since catches for 27 years out of the total time series of 53 years have no catch reports, although one or two fishermen may have fished within those years. Consequently, a combination of average and maximum values were used to develop the options shown in Table 30. As described above, under some options, the historical longline catches in 1990 and 1991 have been factored in to generate upper limits for the number of pelagic permits and catches, by expressing this volume of catch as the equivalent that might be caught by non-longline pelagic fishing vessels.

3.3.5 Options for No-take MPAs under Scenarios 1 and 2

The following options are being considered under Scenarios 1 and 2 for no-take MPAs in the proposed NWHI sanctuary. No fishing of any type would be allowed in these areas (with the exception of Midway-based recreational fishing and federally permitted research activities as described above.

No Action

Under this option, no no-take MPAs would be established in the proposed NWHI sanctuary.

Option A

Under this option, no-take MPAs would be established as illustrated in Figure 22 utilizing the smaller area closure shown in the north (west of 174 W. longitude). No fishing of any type would be allowed within these areas, with the exception of federally permitted research activities and Midway-based recreational fishing as described above.

Option B

Under this option, no-take MPAs would be established as illustrated in Figure 22 utilizing the larger area closure shown in the north (west of 177 W. longitude). No fishing of any type would be allowed within these areas, with the exception of federally permitted research activities and Midway-based recreational fishing as described above.

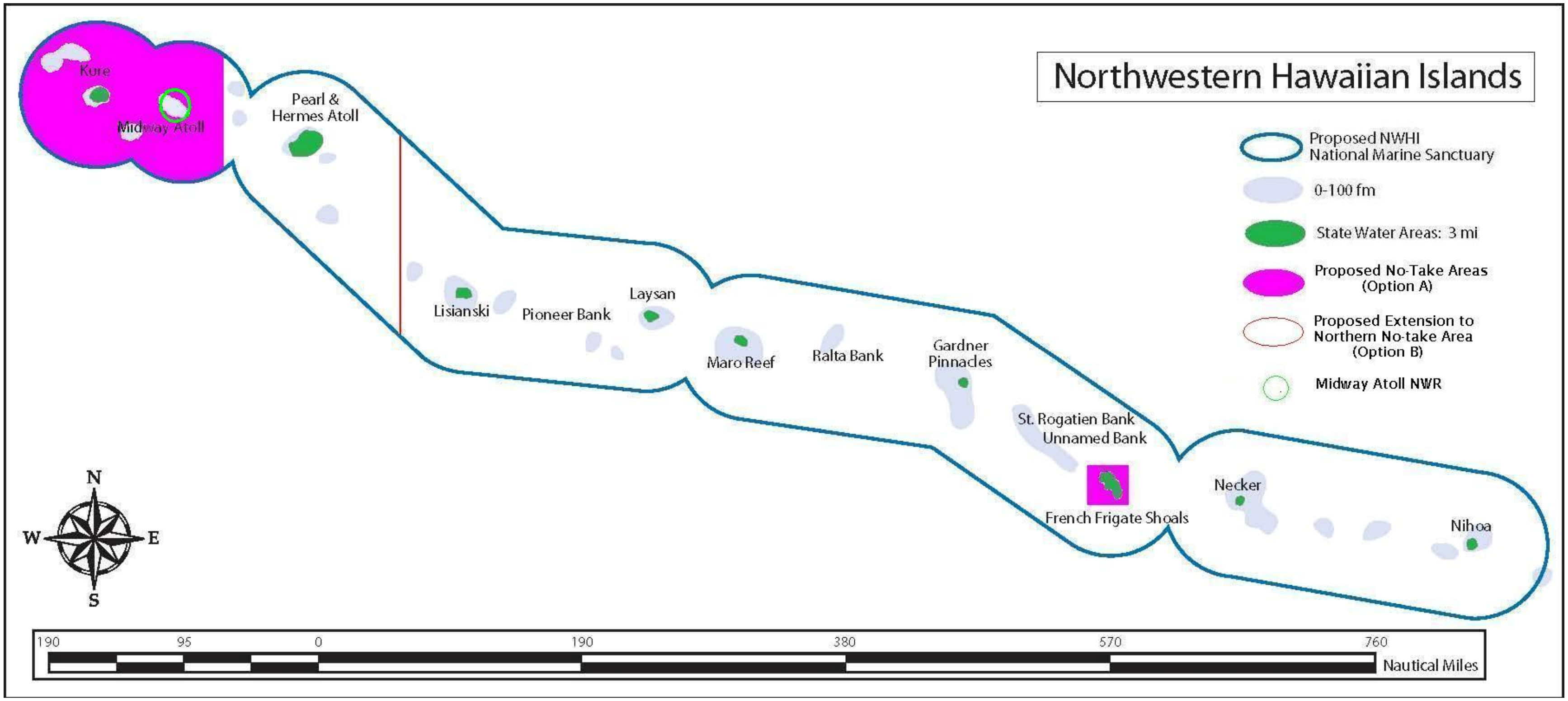


Figure 22: Potential NWHI No-take MPAs

<u>Proposed No-Take Areas Option A</u>

1. No-Take Area West of 174 º long. (except at Midway Atoll)
2. No-Take around French Frigate Shoal
   Point A: 24 º 0' N lat; 167 º 40' W. long
   Point B: 24 º 0' N lat; 166 º 0' W. long
   Point C: 23 º 30' N lat; 167 º 40' W. long
   Point D: 23 º 30' N lat; 166 º 0' W. long

<u>Proposed No-Take Areas Option B:</u>

Same as Option A except, extend No-Take Area to West of 177 º long (except at Midway Atoll)

3.4 Alternative 3: Preliminarily Preferred Alternative

The measures indicated under Alternative 3 were developed by the Council in consideration of current scientific information regarding the NWHI, and NOAA's policy and "sideboards" for the proposed NWHI sanctuary (13 bottomfishing permits with a total annual catch of approximately 350,000 lbs, and 2 pelagic permits with a total annual catch of approximately 180,000 lbs). The National Marine Sanctuaries Act, as well as the proposed goals and objectives for the proposed NWHI sanctuary and other information in the NMSP's September 4, 2004 *"Proposed Northwestern Hawaiian Islands National Marine Sanctuary Advice and Recommendations on Development of Draft Fishing Regulations Under the National Marine Sanctuaries Ac Section 304(a)(5)"* have also been considered, as have the two EOs that implemented the NWHI Coral Reef Reserve. In addition, the principles, purposes and policies of the Magnuson Stevens Act and other applicable laws have been considered, as has the rationale provided by NOAA for its disapproval of the Council's April 14, 2005 recommendation. The measures recommended here are believed to be consistent with the directives above as appropriate.

Alternative 3 was developed and adopted by the Council at their 131st meeting held March 13-16 in Honolulu Hawaii. The new regulatory features of this alternative (below) would apply under scenario 1 (allow limited NWHI fishing indefinitely) and scenario 2 (allow limited NWHI fishing until 2025). Under scenario 3 current regulations would remain in place without change except for the requirements for federal MSA permits and reporting.

Under Alternative 3, limited fishing would be allowed in federal waters of the proposed NWHI National Marine Sanctuary and managed under the Magnuson-Stevens Act (except for recreational fishing at Midway Atoll), implemented through MSA codified federal regulations and subject to the following restrictions:

1. A closure be established indefinitely for all harvests of crustacean, precious coral and coral reef ecosystem species;
2. All commercial and recreational fishing be subject to Magnuson-Stevens Act permit and logbook reporting requirements;
3. Recreational fishing permits be issued on a case-by case basis, and that the Council will evaluate the need for further management.
4. Limited-entry NWHI bottomfish permits be capped at 14, with 7 permits for the Hoʻomalu Zone and 7 permits for the Mau Zone (the two Community Development Program permits for indigenous use to be included in the latter and issued as previously recommended by the Council);
5. The annual bottomfish catch be limited to 381,500 lbs (85 percent of MSY);
6. Non-longline commercial pelagic fishing permits be capped at three (3);
7. The annual commercial pelagic catch by the non-longline pelagic fishery and the limited-entry bottomfish fishery be limited to 180,000 lbs.;
8. No-take MPAs be established around French Frigate Shoals and West of 174° W longitude;
9. The use-or-lose requirements for renewal of commercial bottomfish permits be removed;

10. Relinquished or revoked commercial bottomfish permits be reissued by NMFS in accordance with the existing procedures for Ho'omalu Zone permits and as described in the Council's previous recommendation for Mau Zone permits.
11. Federally permitted research regarding fishery and ecosystem conservation and management would be allowed in Federal waters .

Note: the above catch limits for bottomfish and pelagic species are not species or vessel specific and are not intended to be quotas or hard limits but would rather be "checkpoints" that, if reached, would prompt fishery scientists and the Council to examine whether further additional management measures were needed.

In addition, the Council recommended that NMFS work with the USFWS and request the USFWS to:

a. Apply the same data reporting protocols that NMFS uses in collecting fishery dependent data;
b. Accurately collect and maintain all non-commercial fishing data collected on Midway Atoll

The Council also recommended that Native Hawaiian subsistence and sustenance use of NWHI fishery resources be allowed and managed in federal waters of the proposed NWHI National Marine Sanctuary under the National Marine Sanctuaries Act, and that NMFS work with the NMSP to ensure that all catch data is collected so it can be incorporated into NMFS' ecosystem assessments and monitoring of stock sustainability.

Finally, the Council recommended that harvests of NWHI fishery resources by permitted research, enforcement and management (e.g. marine debris clean up vessels and sanctuary "management vessels") vessels for on-board consumption (i.e. sustenance) be allowed and managed in federal waters of the proposed NWHI National Marine Sanctuary under the National Marine Sanctuaries Act, and that NMFS work with the NMSP to ensure that all catch data is collected so it can be incorporated into NMFS' ecosystem assessments and monitoring of stock sustainability.

4.0 CHAPTER FOUR: ANALYSIS OF THE ALTERNATIVES

This chapter presents a summary of the anticipated direct impacts of the above alternatives on the NWHI marine environment, ecosystem, and fisheries, as well as their indirect impacts on the region and nation. Because many measures are considered under more than one alternative (e.g. closure of the precious corals fishery), these analyses are presented by their commonalities across alternatives as shown in Table 31. Under all alternatives, NWHI resources would continue to be impacted by natural events as well as marine research, ecotourism and other non-fishing activities. Those impacts are not analyzed here.

Table 31. Overview of Fishery Measures under Each Alternative

	Alt. 1A	Alt. 1B	Alt. 2			Alt. 3
Fishery			Scenario 1	Scenario 2	Scenario 3	
Bottomfish	Open	Closed	Open	Closed	Closed	Open
Pelagics	Open	Closed	Open	Closed	Closed	Open
Coral Reef Ecosystem	Open	Closed	Closed	Closed	Closed	Closed
Crustaceans	Closed	Closed	Closed	Closed	Closed	Closed
Precious Corals	Open	Closed	Closed	Closed	Closed	Closed

4.1 Impacts of Continued Limited Fishing Alternatives

Under Alternatives 1A, Alternative 2's Scenario 1, and Alternative 3, limited commercial and recreational fishing would continue to be allowed indefinitely within the proposed NWHI sanctuary. The anticipated impacts of these continued fisheries are discussed below.

4.1.1 Anticipated Impacts on Target and Non-Target Fish Stocks

Clearly all alternatives that result in the harvesting of marine species will immediately reduce that specie's abundance in the NWHI. However the critical issue for managers is whether that reduction will have adverse population or ecosystem impacts. Under the three continued limited fishing alternatives, fishery impacts to target and non-target stocks are anticipated to remain unchanged. Fisheries would continue to be managed at controlled levels and would be expected to retain their current resiliency and natural condition. Fisheries would continue to be managed under limited entry and harvest quota systems as described in Chapter 3 and the NWHI ecosystem would be anticipated to remain in the pristine condition observed in 2002 during the multi-agency NOWRAMP study, which followed more than a decade of active fishery management by the WPRFMC (Maragos and Gulko 2002). In addition, new no-take areas in the northern end of the chain and around French Frigate Shoals (under Alternative 2's Scenario 1 and Alternative 3) would further reduce the potential for fishery impacts to target and non-target stocks. Providing area closures in both the northern end of the chain and at French Frigate Shoals may result in the provision of "stepping stones" to aid any larval, juvenile, or adult transport of fish stocks. Genetic and oceanographic studies have indicated that NWHI species may "land" at French Frigate Shoals and subsequently move throughout the NWHI.

The implementation of no-take areas would provide refuge for fish stocks; it may also result in local depletions of some species as fishery participants will concentrate their effort in smaller available open areas. It is possible that closed areas could serve as reservoirs to help augment stocks in surrounding fishing grounds and increase total stock biomass, thereby mitigating the effects of fishing. If biomass increases enough, spillover may increase fishery yields in adjacent open areas. However, the ability of closed areas to increase yields has not been demonstrated for bottomfish or pelagic fisheries in Hawaii. It should also be noted that, even if a closed area has the potential to have a positive effect on fish populations and fishery productivity, it may take several years after the implementation of area closures for this effect to be realized. Given this time lag, it is unlikely that the potential economic benefits of area closures would accrue to the current generation of fishery participants. Pelagic species and fisheries are less likely to benefit from the no-take areas as these fish are highly mobile and would be expected to move relatively quickly through the no-take areas.

The harvest of bottomfish is a direct impact on the target species. As described in Chapter 3, a combination of fishing effort control through a limited entry system and control of harvest through biological reference points is used to maintain a sustainable NWHI bottomfish fishery.

The maximum sustainable yield (MSY) of bottomfish MUS from the NWHI as a whole has been estimated to be 586,000 pounds (Kobayashi 1996). Using average operational characteristics for these vessels, Pooley (1996) partitioned the MSY into 131,000 pounds for the Mau Zone and 455,000 pounds for the Ho'omalu Zone. In the most recent year for which data are available (2003) 77,000 pounds of bottomfish were harvested from the Mau Zone and 145,000 pounds of bottomfish were harvested from the Ho'omalu Zone. More recently, NMFS has reestimated the MSY values to be 100,399 lbs for the Mau Zone and 348,385 lbs for the Ho'omalu Zone (PIFSC, in press).

The Council's existing participation targets are seven vessels for the Ho'omalu Zone and ten vessels for the Mau Zone. As acknowledged in NOAA's 2004 Advice and Recommendations on Development of Draft Fishing Regulations under the National Marine Sanctuaries Act Section 304(a)(5) discussion of NWHI commercial bottomfish/pelagic trolling fishery "fishery statistics (spawning potential ration [sic], percent immature, average size, and CPUE) indicate a healthy, well managed and sustainable fishery…The allowable gear and fishing methods are highly selective, minimizing habitat impacts and unwanted bycatch" (NOAA 2004). Regarding the NWHI commercial pelagic trolling fishery, NOAA observes that "the current fishing gear and methods have little to no impact on the habitat and very low levels of bycatch" (NOAA 2004).

Under Scenario 1 and Alternative 3, the target numbers of commercial bottomfish permits for the Ho'omalu and Mau Zones would each be seven (for a total of 14 vessels) and NMFS would reissue inactive permits to qualifying applicants. The total fleet-wide catch of bottomfish by these permit holders would be capped at 381,500 pounds per year (a potential catch of 85 percent of MSY).

As described in Section 2.2.8, commercial and recreational bottomfish fishing in the region is conducted with handlines that are set and hauled using electric, hydraulic or hand-powered reels. Vessels usually are equipped with electronic navigational devices to relocate fishing areas, and sonar devices to target productive habitat and fish aggregations. This gear is relatively selective, with the ability to successfully target particular species groups dependent upon the skill of the vessel captain. Experienced vessel crew have the ability to catch the desired species with little bycatch (fish which are discarded for economic, regulatory or other reasons). As discussed in Section 2.2.1, NWHI bottomfish stocks are healthy. Calculations of SPR and percent immature fish in the catch indicate no localized depletion for any of the species managed in the NWHI. Recent analysis by PIFSC supports these findings and indicates improving stock status in both sectors of the NWHI (PIFSC in press). Continued fishing under the existing limited entry system would not be anticipated to result in overfishing or overfished stocks. Indirect impacts could include habitat damage or changes in trophic dynamics such as alterations of relative predator-prey abundance. However, given the low level of NWHI bottomfish fishing effort, the large amount of bottomfish habitat in the NWHI, and the relatively small quantities of bycatch in the fishery (see Section 2.2.8.1); neither significant habitat impacts, nor alterations of trophic dynamics are likely.

The harvest of pelagic fish under these alternatives would represent a direct impact on the target species. As described in Chapter 2 however, this is small fishery and its presence or absence is not expected to have an appreciable impact on its target or non-target stocks. The highest anticipated pelagic catch by commercial non-longline pelagic fishing vessels and bottomfish vessels under these various alternatives would be 465,000 lb. Based on the average species composition this would include 139,400 lb of yellowfin tuna and 32,800 lb of bigeye tuna. Average annual Pacific-wide catches of yellowfin and bigeye tunas between 2000 and 2004 amounted to 782,000 mt and 239,000 mt respectively. Catches of yellowfin and bigeye in the NWHI would thus represent only 0.008 percent and 0.006 percent of the Pacific wide total catches of these species respectively. This impact would not be significant to these stocks.

Because the special permit case-by-case approval process, as well gear restrictions and other measures recommended by the Council for the NWHI in the Coral Reef Ecosystems FMP were disapproved by NMFS; these alternatives could potentially result in overfishing of coral reef associated species. However given experience to date this is unlikely in the near- term as there has been little interest in this remote fishing area, and the majority of coral reef ecosystem species occur within state waters which are now closed to fishing except with a special permit.

Under Alternative 1A, the NWHI crustacean fishery would effectively remain closed until a new model currently being developed by PIFSC is available to determine exploitable populations (currently set at zero). In addition it may be that under the new model, a harvest guideline of 13 percent of the exploitable population would not correspond to a 10 percent risk of overfishing and a new harvest guideline may need to be considered. Thus the risk of localized overfishing under this alternative would be dependent on the estimates of exploitable populations and the reliability of those estimates.

Also under Alternative 1A, impacts of the continuation of the current management regime for precious corals on target and non-target stocks are anticipated to be minimal as only selective gear is allowed and harvests are strictly controlled by the use of bed quotas, minimum sizes and other measures (see Chapter 3).

4.1.2 Anticipated Impacts on Protected Species

Under these alternatives, the impacts of NWHI fisheries on protected species are anticipated to remain unchanged. Fisheries would continue to be managed at controlled levels, observers would continue to be placed on bottomfish and lobster vessels if requested by NMFS, and physical interactions with protected species would remain at the virtually zero levels observed for these fisheries as described in section 2.2.7.4. In addition, new no-take areas in the northern end of the chain and around French Frigate Shoals (under Alternative 2's Scenario 1 and Alternative 3) would further reduce the potential for fishery interactions with sea turtles, monk seals and seabirds that are known to nest and forage in these areas.

As described in Chapter 3, the Bottomfish FMP contains management measures intended to monitor and mitigate interactions between the fishery and Hawaiian monk seals. The NMFS Regional Administrator has the authority to place federal observers on board bottomfish vessels to record interactions with Hawaiian monk seals or other protected species if this action is deemed necessary. In addition, before the NMFS Regional Administrator issues a Mau Zone or Ho'omalu Zone limited access permit to fish for bottomfish, the primary operator and relief operator named on the application form must have completed a protected species workshop conducted by NMFS. Since 1989, when the NWHI bottomfish limited access permit fishery was established, NMFS has certified more than 40 vessel captains who have completed the requisite one-time protected species workshop program. The HMSRT (1999) has suggested that direct interactions between Hawaiian monk seals and the NWHI bottomfish fishery can best be mitigated by continuing to educate fishermen through briefing materials and workshops. Recently, NWHI bottomfish fishermen as a group have agreed to voluntarily attend annual protected species and regulatory workshops conducted by NMFS. The workshops, for all permit holders and vessel operators, would review Hawaiian monk seal life history, the status of interaction mitigation efforts, and relevant regulatory measures. Prohibitions on the use of explosives and chemicals reduce the potential for incidental harm to Hawaiian monk seals and help protect Hawaiian monk seal habitat. By reducing fishing effort, the limited access programs for the Mau Zone and Ho'omalu Zone decrease the potential for direct impacts from Hawaiian monk seals approaching bottomfish fishing vessels and feeding on discarded fish or becoming hooked or entangled in fishing gear. The restriction on fishing effort also lowers the chance of vessel groundings or other accidents that could result in Hawaiian monk seal mortality or pollution of habitat.

Recent observer data (fourth quarter of 2003 through 2005) shows eight interactions with seabirds during 31 observed fishing trips. Seven were hooked or entangled while the vessels were trolling and one was caught during bottomfishing operations. This low level of direct interactions between seabirds and the bottomfish fishery would continue under this alternative. While continued bottomfish fishing may affect a very limited number of individual seabirds, it is expected to have no effect on seabird distribution, survival or population structure. The potential for indirect interaction due to competition for prey is negligible, as seabirds do not prey upon bottomfish or bycatch from this fishery.

Continuation of NWHI pelagic fishing is not anticipated to result in adverse impacts to protected species as this is small hook-and-line fishery (e.g. trolling and pelagic handlining) that is not believed to interact with sea turtles or monk seals. Seabird interactions may occur and NMFS has provided pamphlets on avoiding and mitigating such interactions to Hawaii's small boat fishermen. The small scale of this fishery (due in large part to the remote location) means that these interactions are anticipated to remain at low levels for the foreseeable future.

Unregulated fishing for coral reef ecosystem species under Alternative 1A could potentially result in interactions with protected species. However given experience to date this is unlikely in the near- term as there has been little interest in this remote fishing area, and the majority of coral reef ecosystem species occur within state waters which are now closed to fishing except with a special permit.

Under Alternative 1A, an active NWHI lobster fishery could potentially affect monk seals if lobsters are an important part of the diet of monk seals. However given that the Crustaceans FMP only allows the harvest of 13 percent of each area's exploitable population (currently set at zero), it appears unlikely that these removals will jeopardize monk seals or their populations. In addition, under the FMP (which must comply with the Endangered Species Act) no harvest guideline will be issued until an ESA consultation is conducted and concludes that a lobster fishery can continue without jeopardizing the continued existence of monk seals.

An active NWHI precious corals fishery under Alternative 1A is unlikely to affect monk seals, sea turtles, or seabirds as only selective gear can be used and harvests would continue to be limited by bed quotas, size limits and other measures as described in Chapter 3. Although there has been some information showing that monk seals may use gold coral beds as important foraging habitats, more recent studies have cast doubt on this finding. There is no evidence that sea turtles rely on precious coral beds and interactions with seabirds are highly unlikely as submersible vehicles or SCUBA are used in harvesting operations.

4.1.3 Anticipated Impacts on Marine Habitat

Under these alternatives, applicable fishery impacts to marine habitat are anticipated to remain unchanged and NWHI marine habitat would be expected to retain its current resiliency and natural condition. Fisheries would be managed under limited entry and harvest quota systems as described in Chapter 3 and the NWHI ecosystem would be anticipated to remain in the pristine condition observed in 2002 (Maragos and Gulko 2002). In addition, new no-take areas in the northern end of the chain and around French Frigate Shoals (under Alternative 2's Scenario 1 and Alternative 3) would further reduce the currently low potential for fishery impacts to marine habitat in these areas.

As described in Section 2.2.6, each fishery management plan contains definitions of Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC). At their extremes these areas encompass the entire EEZ water column as well as the sea floor out to a depth of 400 meters and represent the majority of marine habitat potentially affected in the NWHI.

Continuation of the current bottomfish fishing regulations in the NWHI will not likely adversely affect EFH or other marine habitat as they are not likely to lead to substantial physical, chemical or biological alterations to the habitat, or result in the loss of, or injury to, these species or their prey. Studies with submersible research vessels conducted at bottomfishing banks in the NWHI have found minimal evidence of fishing impacts to habitat (see Section 2.2.6).

Regulations adopted in the Bottomfish FMP both directly and indirectly reduce the likelihood of impacts to habitat caused by fishing gear and operations. The FMP prohibits the use of destructive gears such as explosives, poisons, trawl nets and bottom-set ground lines in the fishery.

Bottomfish fishing activities direct impact the water column only by the release of chum. A bottomfish fishing handline rig typically consists of a terminal weight that hangs below a series of branch lines with baited hooks. Above the branch lines is a small bag containing a handful of chum, usually a mixture of chopped up fish parts and filler such as oats. When the line is dropped, it's allowed to sink to the bottom and then pulled up several fathoms. The line is then jerked sharply to open the bag and release the chum over the baited hooks. The chum moves with the current while slowly sinking. The area affected is extremely localized and the effect is very transient. The constituents of the chum represent a small food subsidy to nearby fish and benthic fauna.

Indirect impacts to the water column could occur through pollutant discharges from bottomfish fishing vessels. The day-to-day operations of a fishing vessel can produce a number of waster products, including oil, sewage and garbage that can affect marine habitat. The small number of vessel permitted to fish in the bottomfish fishery and laws against the discharge of garbage at sea (i.e. MARPOL) minimizes this potential impact.

Known NWHI precious coral beds are well below the depths where bottomfish vessels anchor or fish. Neither direct nor indirect impacts from bottomfish fishing occur within the depth range fished for bottomfish. Individual colonies of black coral could be damaged or destroyed by anchors or weights on the terminal end of the fishing line. Habitat damage however would be expected to be insignificant because of the hard substratum favored by these corals.

To fish at greater depths (below about 120 m), bottomfish fishermen typically anchor upwind of the desired location in shallower water and drift downwind letting out anchor line scope until the desired depth is reached. Thus, impacts to benthic habitat at these greater depths are restricted to small fishing weights (typically 2-4 kg) hitting the bottom as lines are being deployed. Impacts to either hard or soft bottom habitats would be minimal.

The accidental grounding of a fishing boat can adversely affect shallow water habitat. The impact of a vessel striking the bottom can physically destroy habitat in the immediate area. The possible subsequent break-up of the vessels and release of fuel and oil can result in pollution of habitat and mortality of marine life. A grounding can also lead to the introduction of alien species, such as rodents or insects, which can have an adverse impact on terrestrial native fauna and flora in the area. Fishing vessel groundings are relatively rare events with only two NWHI groundings in the past 15 years. One of these was a longline vessel, the other a lobster boat. In both cases there was localized habitat damage under the hull but no reported significant impacts to surrounding areas.

Impacts of the continuation the small-scale NWHI pelagic fishery on marine habitat are also anticipated to be minimal as this is hook and line fishery which operates through the suspension of baited hooks in the water column and has little to no contact with the substrate.

Because the gear restrictions and other measures recommended by the Council for the NWHI in the Coral Reef Ecosystems Fishery Management Plan were disapproved by NMFS, this alternative could potentially result in impacts to marine habitat from the use of destructive gears such as toxins or explosives. However given experience to date this is unlikely in the near- term as there has been little interest in this remote fishing area, and the majority of coral reef ecosystem species occur within state waters which are now closed to fishing except with a special permit.

Continuation of the current crustacean fishery management regime and a potential re-opening under Alternative 1A will not likely adversely affect marine habitat as Moffit et al. (2005 in review) found that gear lost in this fishery has not been found to be ghost fishing (still catching organisms), and that although direct damage to the benthic habitat by the traps has not been studied, it is not likely to be substantial due to the low relief, hard substrate that characterizes the fishing grounds. Impacts to the water column of lobster trapping are anticipated to be negligible and consist of at most a release of small amounts of bait into the surrounding area.

Similarly, impacts of the continuation of the current management regime for precious corals on marine habitat under Alternative 1A are anticipated to be minimal as only selective gear is allowed and harvests are strictly controlled by the use of bed quotas, minimum sizes and other measures (see Chapter 3).

4.1.4 Anticipated Impacts on Biodiversity and Ecosystem Function

Impacts on bbiodiversity and ecosystems would be unchanged under these alternatives. Limited bottomfish and pelagic fishing operations would continue and the proposed NWHI sanctuary would be anticipated to remain in the pristine condition recently observed (Maragos and Gulko 2002). In addition, new no-take areas in the northern end of the chain and around French Frigate Shoals (under Alternative 2’s Scenario 1 and Alternative 3) would further reduce the potential for fishery impacts on biodiversity and ecosystem function. Providing area closures in both the northern end of the chain and at French Frigate Shoals may result in the provision of “stepping stones” to aid any larval, juvenile, or adult transport of fish stocks. Genetic and oceanographic studies have indicated that NWHI species may “land” at French Frigate Shoals and subsequently move throughout the NWHI.

It is possible that closed areas could serve as reservoirs to help augment stocks in surrounding fishing areas. However, the ability of closed areas to increase yields in adjoining areas has not been demonstrated for bottomfish or pelagic fisheries in Hawaii. It should also be noted that, even if a closed area has the potential to have a positive effect on fish populations and fishery productivity, it may take several years after the implementation of area closures for this effect to be realized because of the high age of first reproduction for most bottomfish species. Pelagic species and fisheries are less likely to benefit from the no-take areas as these fish are highly mobile and would be expected to move relatively quickly through the no-take areas.

Because the special permit case-by-case approval process, as well gear restrictions and other measures recommended by the Council for the NWHI in the Coral Reef Ecosystems FMP were disapproved by NMFS, these alternatives could potentially result in increased fishing of coral reef associated species and any associated impacts to biodiversity and ecosystem function. However given experience to date this is unlikely in the near-term as there has been little interest in this remote fishing area, and the majority of coral reef ecosystem species occur within state waters which are now closed to fishing except with a special permit.

As described above, under Alternative 1A the NWHI crustacean fishery would effectively remain closed until a new model currently being developed by PIFSC is available to determine exploitable populations (currently set at zero). A re-opened fishery would not be anticipated to have significant impacts on biodiversity and ecosystem function habitat. Moffit et al.(2005 in review) concluded that lobster trapping activities are responsible for changes in abundance of a few species (target species have declined and some crab species have increased due to competitive replacement) of the benthic community in the NWHI, but do not appear to have resulted in major changes to the ecosystem. Moffit et al. also found that gear lost in this fishery has not been found to be ghost fishing (still catching organisms).

Also under Alternative 1A, impacts of the continuation of the current management regime for precious corals on biodiversity and ecosystem function as only selective gear is allowed and harvests are strictly controlled by the use of bed quotas, minimum sizes and other measures (see Chapter 3).

4.1.5 Anticipated Impacts on Public Health and Safety

Impacts on public health and safety would be unchanged under these alternatives as limited fishing operations would continue under current operating patterns. These fisheries are not considered to be especially dangerous ones and no serious injuries or loss of life have been reported in any NWHI fishery managed by the Council.

4.1.6 Anticipated Impacts on Fishery Participants

Under these alternatives impacts on NWHI fisheries and fishery participants are anticipated to remain generally unchanged (see Chapter 2). Applicable fisheries would continue to be managed under their respective fishery management plans and no new measures affecting fishery operations would be implemented. However renewal of the crustacean or precious corals fisheries would provide access to controlled fishery harvests with associated benefits to fishery participants. The currently available unregulated access to coral reef ecosystem resources could lead to conservation problems if this fishery were to expand. However given experience to date this is unlikely in the near- term as there has been little interest in this remote fishing area, and the majority of coral reef ecosystem species occur within state waters which are now closed to fishing except with a special permit.

4.1.7 Anticipated Impacts on Fishing Related Activities

All fisheries generate additional economic activities through supply industries (e.g. fishing supply shops, fuel stations and boatyards) as well as through distribution and marketing industries (e.g. fish wholesalers and retailers, transportation systems, restaurants and other marketers). Under these alternatives current impacts on fishing related economic activities are anticipated to remain unchanged. Fisheries would continue to be managed under their respective fishery management plans and no new measures would be implemented. However renewal of the crustacean or precious corals fisheries would provide access to controlled fishery harvests with associated benefits to fishery supply and distribution industries.

The historical contribution of NWHI fisheries to Hawaii's economy is small. However, given the vulnerability of the economies of Hawaii and other U.S. Pacific Islands to sharp and sudden economic downturns, as evidenced by negative changes in the economic condition of most of these island areas during the past several years, the importance of economic diversification is apparent. Commercial fishing appears to be one of the few economic sectors outside the mainstay of tourism in which substantial economic growth is possible.

4.1.8 Anticipated Impacts on Hawaii's Communities

In addition to their economic returns to fishery participants and support industries, Hawaii's fisheries contribute to Hawaii's broader communities as described in Chapter 2. Impacts on Hawaii's communities are anticipated to be unchanged under these alternatives. NWHI fishery products would remain available to consumers both in markets and restaurants.

4.1.9 Anticipated Impacts on Native Hawaiians

Impacts on Native Hawaiians are anticipated to be unchanged under these alternatives. Native Hawaiians would have the same access rights as others to NWHI fisheries and resources. The Council's recommendation for the allocation of two Mau Zone bottomfishing permits to indigenous communities would remain in place, however its approval and implementation by NMFS remains uncertain.

4.1.10 Anticipated Impacts on the Nation

Impacts on the nation of continuing limited NWHI fishing are anticipated to be mixed as these measures will be regarded positively by those who believe the resources are healthy and well managed, and negatively by those who believe fishery closures are the best way to manage these resources. In addition, many of the nation's residents are largely uninformed about NWHI fisheries and likely won't have any reaction. The proportion of the population in each group is unknown.

This alternative will continue the supply of NWHI fishery products to the nation, which will positively affect consumers who value these fish highly. Supplies to local consumers, markets and restaurants will be maintained, as will exports to suppliers and restaurants in the continental U.S. and elsewhere (see section 2.3.1). In addition, the long tradition of small-scale NWHI fishing will be continued and the knowledge held by its participants will continue to be passed down to future generations.

4.1.11 Anticipated Impacts on Other Fisheries

Other fisheries would not be impacted by these alternatives as currently available NWHI fishery resources would continue to supply markets and restaurants.

4.2 Impacts of Fishery Closure Alternatives

All alternatives contain some fishery closures (see Table 31). The impacts of these closures are discussed below.

4.2.1 Anticipated Impacts on Target and Non-target Species

Alternative 1B and Alternative 2's Scenarios 2 and 3 would all lead to closure of bottomfish fishing within the proposed NWHI sanctuary, each on its own time scale (generally 5-20 years). Under these alternatives, short-run fishery impacts on target and non-target stocks are anticipated to remain largely unchanged. Bottomfish landings would be limited to some number below the stock's MSY and stocks would maintain or continue to improve their current healthy status (PIFSC, in press). The implementation of fishery landing limits is likely to result in some level of discarding, as species targeting is difficult and participants may be motivated to discard less valuable species in favor of higher valued fish. However the fact that 2000 landings (262,000 lbs) were well below MSY for this fishery means that it is unlikely that these discards will have an adverse impact on species populations or the NWHI ecosystem. The implementation of area closures may result in local depletions of some species as fishery participants will be forced to concentrate their effort in smaller available open areas. In the long-run, the fishery will be closed either through regulated attrition or through a fishery closure (e.g. in 2025). This will remove all actual and potential federal fishery impacts on NWHI bottomfish target and non-target stocks. This is unlikely to have an impact on their currently positive population trajectory or the currently pristine NWHI ecosystem (Maragos and Gulko 2002). Similarly it is unlikely to have an impact on the MHI populations or ecosystem as evidence of mixing between the NWHI and MHI is limited. However, if significant transfer from the NWHI to the MHI does occur, the robust NWHI stocks should already be contributing to the MHI stocks. The degree to which this would increase under these alternatives is unknown but believed to be low, especially in light of recent findings indicating that larval transfer is more likely to flow from the MHI to the NWHI (see Section 2.1). Any positive impacts would be anticipated to be potentially offset by increases in MHI bottomfishing effort as a result of the highly efficient NWHI vessels relocating to the MHI, as well as existing MHI vessels increasing landings to fill the market void left by the closure of the NWHI fishery.

Alternative 1B and Alternative 2's scenarios 2 and 3 would also close the pelagic fishery over approximately 5-20 years. Because this is such a small fishery, impacts on pelagic stocks will be insignificant whether it is open or closed.

Alternative 1B, Alternative 2 and Alternative 3 would also close the NWHI crustacean, precious corals, and coral reef ecosystem fisheries - under Alternative 1A, a de facto closure of the crustacean fishery would remain in place as described above. These closures will remove all potential federal fishery impacts on target and non-target stocks and may have some positive effects on MHI stocks if significant transfer from NWHI stocks does occur. If it does occur, the currently unfished NWHI stocks should already be contributing significantly to the MHI stocks. The degree to which this would increase under these alternatives is unknown but believed to be low, especially in light of data indicating that larval transfer is more likely to flow from the MHI to the NWHI (see section 2.1). Offsetting increases in MHI effort are unlikely as these NWHI fisheries are currently inactive.

4.2.2 Anticipated Impacts on Protected Species

Closure of various fisheries under the alternatives will remove all potential federal fishery impacts on protected species. This is unlikely have an impact on their population status or trajectories as numerous studies, observer programs and biological opinions have concluded that these fisheries are not likely to adversely affect protected species (see section 2.2.7.4) and no scientifically peer-reviewed studies have documented such adverse impacts.

4.2.3 Anticipated Impacts on Marine Habitat

Closure of various fisheries under the alternatives will remove all potential federal fishery impacts on marine habitat. This is unlikely have a significant effect as research to date has found little to no fishery impacts to NWHI marine habitat (see section 2.3).

4.2.4 Anticipated Impacts on Biodiversity and Ecosystem Function

Closure of various fisheries under the alternatives will remove all potential federal fishery impacts on biodiversity and ecosystem function. This is unlikely have a significant effect as the most recent study of the NWHI ecosystem found it to be pristine and virtually untouched (see section 2.1).

4.2.5 Anticipated Impacts on Public Health and Safety

Closure of various fisheries under the alternatives will remove all fishery threats to public health and safety. This is unlikely have a significant effect as these are not believed to be especially dangerous fisheries and no serious injuries or loss of life have been reported in any NWHI fishery managed by the Council.

4.2.6 Anticipated Impacts on Fishery Participants

Under all alternatives long-run impacts on one or more fisheries and fishery participants are anticipated to be adverse as applicable fisheries would be closed over a time span of approximately 5-20 years.

Bottomfish fishery participants that will be forced to leave the fishery under Alternative 1B and Alternative 2's scenarios 2 and 3 will face a loss of livelihood and income and are likely to experience feelings of anger and frustration as they believe their fishery to be responsible and highly regulated and having no adverse impacts on NWHI marine resources. Some participants may relocate to fish in the MHI bottomfish fishery but given the stresses on this fishery it may be difficult for them to achieve catch rates or revenues comparable to those in the NWHI. This additional MHI effort may also negatively impact current MHI fishery participants as catch competition may further reduce MHI catch rates. These alternatives would also foreclose the opportunity for future harvests of NWHI bottomfish. It is possible that closed areas could serve as reservoirs to help augment stocks in surrounding fishing grounds and increase harvests, thereby mitigating the revenue reductions from fishing restrictions. However, the ability of closed areas to increase yields has not been demonstrated for bottomfish fisheries in Hawaii. It should also be noted that, even if a closed area has the potential to have a positive effect on fish populations and fishery productivity, it may take several years after the implementation of area closures for this effect to be realized in bottomfish because of the high age of first reproduction for most bottomfish species. Given this time lag, it is unlikely that the potential economic benefits of area closures would accrue to the current (and under these alternatives, likely the last) generation of bottomfish fishermen.

Alternative 1B and Alternative 2's scenarios 2 and 3 would also close the pelagic fishery over approximately 5-20 years. Impacts on historical and potential participants in this fishery would be similar to those described above for bottomfish participants. These alternatives would also foreclose the opportunity for future harvests of pelagic resources with their associated benefits to fishery participants.

All alternatives would also close the NWHI crustacean, precious corals, and coral reef ecosystem fisheries - under Alternative 1A, a de facto closure of the crustacean fishery would remain in place as described above. Impacts on historical and potential participants in these fisheries would be similar to those described above for NWHI bottomfish participants. Obviously the loss of potential income from the unfished precious corals and coral reef fisheries will be easier to bear than the loss of historical income from the lobster fishery, however all groups are likely to be angry and frustrated at the closure of fisheries which they believe to be responsible and carefully regulated and unlikely to adversely impact NWHI marine resources. These alternatives would also foreclose the opportunity for future harvests of NWHI crustaceans, precious corals, and coral reef ecosystem resources with their associated benefits to fishery participants.

4.2.7 Anticipated Impacts on Fishing Related Activities

Closure of various fisheries under the alternatives is anticipated to have adverse impacts on fishing related economic activities. Applicable fisheries would be closed over a time span of approximately 5-20 years. As these vessels leave the fishery, revenues to fishery supply shops, fuel, ice, bait and other vendors as will revenues to wholesalers, retailers and other fish marketers will be reduced and then eliminated (see Table 27). In addition these alternatives would also foreclose the opportunity for future harvests of some or all NWHI resources with their associated benefits to fishing related economic activities. Impacts on support industries for dormant or unfished fisheries would be foregone future opportunities rather than reductions in current revenues.

Alternative 1B and Alternative 2's scenarios 2 and 3 would also close the NWHI pelagic fishery over approximately 5-20 years. Impacts on historical and potential participants in this fishery would be similar to those described above for NWHI bottomfish fishery participants.

All alternatives would also close the NWHI crustacean, precious corals, and coral reef ecosystem fisheries - under Alternative 1A, a de facto closure of the crustacean fishery would remain in place as described above. It is possible that closure of the NWHI fishing grounds could help rebuild stocks in the MHI and sustain or increase harvests, thereby mitigating the revenue reductions from fishing restrictions. However, the ability of closed areas to increase yields has not been demonstrated for bottomfish or pelagic fisheries in Hawaii. It should also be noted that, even if a closed area has the potential to have a positive effect on fish populations and fishery productivity, it may take several years after the closure of the NWHI fishery occurs for this effect to be realized for bottomfish because of the high age of first reproduction for most bottomfish species. Given this time lag, it is unlikely that the potential economic benefits of an area closure would accrue to the current (and under these alternatives, the last) generation of bottomfish fishermen. In addition, recent information indicates that larval transfer is more likely to flow from the MHI to the NWHI than the reverse (see section 2.1). Thus closing NWHI fisheries may be unlikely to increase MHI stocks. If fishing effort is allowed to increase in the MHI, any economic gains from closing the NWHI will be dissipated over the long-run.

4.2.8 Anticipated Impacts on Hawaii's Communities

As described above, impacts on communities are anticipated to be mixed as reactions to actions such as closing fisheries within the proposed NWHI sanctuary will be negative for those who believe the resources are healthy and well managed, and positive for those who believe fishery closures are the best way to manage these resources. In addition, many of Hawaii's residents are largely uninformed about NWHI fisheries and likely won't have any reaction. The proportion of the population in each group is unknown. Alternatives that limit or end the supply of NWHI fishery products to Hawaii will obviously affect consumers of these products who will have to switch to other species or imported fish. For some this will be unimportant, however others value these fish highly, especially for Hawaii's traditional Christmas and New Year celebrations. Reductions or a loss of Hawaii-caught bottomfish such as opakapaka and onaga may also reduce revenues to restaurants that depend on these world-renowned "signature" dishes. Alternatives that limit or reduce fishing effort will correspondingly reduce crew and support industry employment opportunities for Hawaii residents.

A study of workers that were laid off following the shut down of the sugar industry on the island of Hawaii found that more than a year after the loss of their jobs 35 percent of the interviewees were still unemployed and seeking work (DeBaryshe et al. undated). Anecdotal evidence suggests that many of those who had found employment were in temporary or seasonal jobs. Although three-quarters of the plantation workers who were laid off made use of state-sponsored job training services, use of these services did not increase the chance of finding a new job. Demographic characteristics such as age, former plantation job grade and education were also largely unrelated to the likelihood of re-employment. It is likely that individuals who lose their jobs as a result of closure of fisheries within the proposed NWHI sanctuary would encounter similar difficulties in finding suitable alternative jobs.

Deckhands would arguably be the most severely impacted by termination of NWHI fisheries, they will probably be the first to lose their jobs and they may have the greatest difficulty in finding alternatives. Pooley and Kawamoto (1990) indicate that the net revenue of a bottomfish fishing vessel operating in the NWHI is most sensitive to the crew share percentage and to changes in total fixed costs. If termination of fisheries in the proposed NWHI sanctuary results in a reduction in net revenues, captain/owners may partly try to make do by decreasing the pay of deckhands or laying them off. Appropriate employment opportunities outside of fishing may be limited for affected individuals, and for many the income losses may be long-term.

Those who become unemployed would face the social and psychological costs of job loss. Individuals who lose their jobs typically experience heightened feelings of anxiety, depression, emotional distress and hopelessness about the future, increases in somatic symptoms and physical illness, lowered self-esteem and self-confidence and increased hostility and dissatisfaction with interpersonal relationships (DeBaryshe et al. undated). In addition, both spouses and children of such individuals are at risk of similar negative effects.

The aforementioned study of workers displaced from the sugar industry found many families reported difficulty in paying bills and in affording transportation, health care and even food and clothing (DeBaryshe et al. undated). The results of this financial strain were high levels of psychological distress among some family members as well as an increase in physical health problems. It is probable that a similar level of stress would be experienced by individuals who lose their jobs as a result of closure of fisheries.

It is likely that many families that depend on fishing and the seafood industry in Hawaii are already economically, socially and psychologically stressed because of fluctuating catch rates, increasing competition and unstable markets. In Hawaii, there have been a number of highly publicized clashes between the owners of large and small fishing boats and between fishermen who are newcomers and those who are established residents. Contributing to this stress is the imposition of ever more restrictive state and federal regulations. Undoubtedly, many fishermen in Hawaii have the sense that government regulations are "boxing them in" and reducing their ability to maintain their characteristic highly flexible fishing strategy (Pooley 1993a; Hamilton et al. 1996; Polovina and Haight 1999). This flexibility is important to the economic success of many smaller and medium-sized fishing vessels because of natural variations in the availability of various types of fish. Closure of fisheries within the proposed NWHI sanctuary would further confine fishermen and could jeopardize the long-term economic viability of their fishing operations. Obviously the loss of potential income from the unfished precious corals and coral reef fisheries will be easier to bear than the loss of historical income from the lobster fishery, however all groups are likely to be angry and frustrated at the closure of fisheries which they believe to be responsible and carefully regulated and unlikely to adversely impact NWHI marine resources.

In addition to potential economic losses associated with the cessation of NWHI fishing, there would be the loss of lifestyle to contend with; assuming that displaced fishermen cannot find an equally satisfactory alternative way of life. A 1993 survey of owner-operators and hired captains who participate in the NWHI bottomfish fishery found that enjoyment of the lifestyle or work itself is an important motivation for fishing among fishery participants. This survey also found that half of the respondents who fish in the Ho'omalu Zone are motivated by a long-term family tradition. Some fishermen would be able to continue their fishing lifestyle by switching to other fisheries, but the aspects of the maritime culture associated specifically with fishing in the NWHI (place names, stories associated with the NWHI, fishing strategies, etc.) would be lost. Fishermen who have invested many years learning to fish in the area would lose the opportunity to connect with that landscape and apply their locale-specific fishing skills and knowledge.

Closure of NWHI fisheries would also likely have a negative impact on those who value the continued existence of Hawaii's maritime tradition and culture. Hawaii's commercial fishing industry dates back nearly 200 years, and fishermen have engaged in commercial fishing in the NWHI since at least the early part of the last century. By reducing the diversity and economic viability of the commercial fishing life way in Hawaii, the closure of NWHI fisheries would diminish the influence of Hawaii's maritime culture. They will also negatively impact Hawaii's social and technical fisheries capital, meaning that not only will a way of life be closed off, but the knowledge of how to successfully fish in these remote fisheries will also be lost. Experience in other Pacific island areas has illustrated that this knowledge can be lost in one generation and often cannot be regained.

Closure of fisheries within the proposed NWHI sanctuary could have environmental justice implications under Executive Order 12898, as it may result in disproportionately high and adverse human health or environmental effects on minority or low income populations. A survey by Hamilton and Huffman (1997) of small-boat owners who engage in Hawaii's commercial and recreational fisheries, including the troll, pelagic handline and bottomfish fisheries, found that a high proportion of the survey respondents were members of minority groups. A survey of bottomfish fishing vessel owners and crews revealed that nine of 16 vessels are owned and/or captained by Caucasians, two by Portugese-Americans, three by Hawaiians, one by a Japanese-

American and one by an Asian-American (specific ethnicity unknown). Less is known about the ethnicity of the crews, and these tend to change much more rapidly than vessel owners or captains. At the time of the survey, three vessels were crewed by Hawaiians, five by Caucasians, and two by a mixture of ethnicities. Regardless of ethnicity, fishermen, especially crew, are likely to be classified as low income.

Furthermore, the Hawaii seafood market includes a particular cultural interest in opakapaka, onaga and other species of bottomfish. Members of certain minority groups in the state consider these species to be showy and auspicious fish for festive occasions. A decrease in the availability of high quality bottomfish during culturally important events would cause a loss in well-being among these consumers, although an assessment of this loss is not possible with available data.

4.2.9 Anticipated Impacts on Native Hawaiians

Native Hawaiian fishery participants that would be forced to leave or prohibited from entering the NWHI fishery under these alternatives will face a loss of livelihood and income and are likely to experience feelings of anger and frustration as they believe the fishery to be responsible and highly regulated and having no adverse impacts on NWHI marine resources. Any permanent closure or loss of access of resources to Native Hawaiians represents a complete loss of traditional rights.

4.2.10 Anticipated Impacts on the Nation

Impacts on the nation of closing NWHI fisheries are anticipated to be mixed as such closures will be regarded negatively by those who believe the resources are healthy and well managed, and positively by those who believe fishery closures are the best way to manage these resources. In addition, many of the nation's residents are largely uninformed about NWHI fisheries and likely won't have any reaction. The proportion of the population in each group is unknown.

The various fishery closures under these alternatives will limit and eventually end the supply of NWHI fishery products to Hawaii which will obviously affect consumers of these products who will have to switch to other species or imported fish. For some this will be unimportant, however others value these fish highly. Reductions or a loss of Hawaii-caught bottomfish such as opakapaka and onaga may also reduce revenues both in Hawaii and in the continental United States to restaurants that depend on these world-renowned "signature" dishes. At the same time, reductions in fishing effort will correspondingly reduce crew and support industry employment opportunities. The closure of NWHI fisheries will negatively impact the nation's social and technical fisheries capital, meaning that not only will a way of life be closed off, but the knowledge of how to successfully fish in these remote fisheries will also be lost. Experience in other Pacific island areas has illustrated that this knowledge can be lost in one generation and often cannot be regained.

4.2.11 Anticipated Impacts on Other Fisheries

All alternatives that limit or prohibit the use of Hawaii's marine resources will likely result in substitution to other species or sources of fish by consumers. Increased consumption of fish imported from poorly managed, unsustainable, or overfished fisheries will negatively impact these fisheries, as well as their participants, communities, and nations. On the other hand, increased and focused consumption of fish from well managed and sustainable fisheries will provide further economic incentives for such practices.

5.0 CHAPTER FIVE: CONSISTENCY WITH THE MSA AND OTHER LAWS

5.1 Introduction

This chapter provides the basis for the Council's belief that the measures contained in this document are consistent with MSA's National Standards and other applicable laws.

5.2 National Standards for Fishery Conservation and Management

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.

The measures in these amendments are consistent with National Standard 1 because they do not include changes that are anticipated to lead to increases in fishing mortality or reductions in stock biomass.

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

The measures in these amendments are consistent with National Standard 2 because they do not allow fishery harvests that are in excess of those supported by 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.

The measures in these amendments are consistent with National Standard 3 because they continue the coordinated management under the MSA of the full range of species known to be present within EEZ waters around the Hawaii Archipelago.

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.

The measures in these amendments are consistent with National Standard 4 because they do not discriminate between residents of different States or allocate fishing privileges among fishery participants, except in the establishment of a NWHI commercial pelagic fishing limited entry plan that is based upon historical participation.

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.

The measures in these amendments are consistent with National Standard 5 because they do not require or promote inefficient fishing practices.

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.

The measures in these amendments are consistent with National Standard 6 because they consider the particular circumstances of each of the NWHI fisheries.

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

The measures in these amendments are consistent with National Standard 7 because they retain all management authority for fisheries within the proposed NWHI sanctuary under the MSA, thus preventing the need for the establishment of new or duplicative measures or monitoring mechanisms under the NMSA.

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.

The measures in these amendments are consistent with National Standard 8 because they were designed with full consideration of their impacts on Hawaii’s fishing 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.

The measures in these amendments are consistent with National Standard 9 because they will not increase fishery bycatch.

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

The measures in these amendments are consistent with National Standard 10 because they do not require or promote any changes to current fishing practices or increase risks to fishery participants.

5.3 Essential Fish Habitat

None of the measures in these amendments are expected to cause adverse impacts to EFH or HAPC for species managed under the Council's Fishery Management Plans (Table 32). Implementation of these amendments is not expected to significantly affect the fishing operations or catches of any fisheries and are not likely to lead to substantial physical, chemical, or biological alterations to the oceanic and coastal habitat, or result in any alteration to waters and substrate necessary for spawning, breeding, feeding, and growth of harvested species or their prey.

The predominant fishing gear types (hook-and-line, troll, traps) used in the NWHI fisheries cause few fishing-related impacts to the benthic habitat of bottomfish, crustaceans, coral reefs, and precious corals. The current management regime protects habitat through prohibitions on the use of bottom-set nets, bottom trawls, explosives, and poisons. None of the measures in these amendments will require changes to fishing gears or strategies, therefore, EFH and HAPC will maintain the same level of protection.

Table 32: EFH and HAPC for Management Unit Species of the Western Pacific Region All areas are bounded by the shoreline, and the seaward boundary of the EEZ, unless otherwise indicated.

MUS	EFH (Juveniles and Adults)	EFH (Eggs and Larvae)	HAPC
Pelagic	Water column down to 1,000 m	Water column down to 200 m	Water column down to 1,000 m that lies above seamounts and banks
Bottomfish	Water column and bottom habitat out to a depth of 400 m	Water column down to 400 m	All escarpments and slopes between 40–280 m and three known areas of juvenile opakapaka habitat
Seamount Groundfish	Water column and bottom from 80 to 600 m, bounded by 29° °–35° ° N and 171 ° E –179° ° W (adults only)	Epipelagic zone (0–200 nm) bounded by 29° °–35° ° N and 171° ° E -179° ° W (includes juveniles)	Not identified
Precious Corals	Keahole, Makapuu, Kaena, Wespac, Brooks, and 180 Fathom gold/red coral beds, and Milolii, S. Kauai, and Auau Channel black coral beds	Not applicable	Makapuu, Wespac, and Brooks Bank beds, and the Auau Channel

MUS	EFH (Juveniles and Adults)	EFH (Eggs and Larvae)	HAPC
Crustaceans	Bottom habitat from shoreline to a depth of 100 m	Water column down to 150 m	All banks within the Northwestern Hawaiian Islands with summits less than 30 m
Coral reef ecosystem	Water column and benthic substrate to a depth of 100 m	Water column and benthic substrate to a depth of 100 m	All MPAs identified in the FMP, all PRIA, many specific areas of coral reef habitat (see Chapter X)

5.4 Coastal Zone Management Act

The Coastal Zone Management Act requires a determination that a recommended management measure has no effect on the land or water uses or natural resources of the coastal zone or is consistent to the maximum extent practicable with an affected state's approved 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 a determination that the recommended measures are consistent, to the maximum extent practicable, with the state coastal zone management program.

5.5 Endangered Species Act

The Endangered Species Act (ESA) requires that any action authorized, funded, or carried out by a federal agency ensure its implementation would not jeopardize the continued existence of listed species or adversely modify their critical habitat. Species listed as endangered or threatened under the ESA that have been observed, or may occur, in the NWHI are listed below (and are described in more detail in Chapter X):

- All Pacific sea turtles including the following: olive ridley sea turtles (*Lepidochelys olivacea*), leatherback sea turtles (*Dermochelys coriacea*), hawksbill turtles (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*), and green sea turtles (*Chelonia mydas*).

- The humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter macrocephalus*), blue whale (*Balaenoptera musculus*), fin whale (*B. physalus*), and sei whale (*B. borealis*). In addition, one endangered pinniped, the Hawaiian monk seal (*Monachus schauinslandi*) is known to occur in the NWHI.

ESA consultations were conducted by NMFS and the U.S. Fish and Wildlife Service (for species under their jurisdiction) to ensure that ongoing fisheries operations—including the bottomfish and seamount groundfishery, the Hawaiian lobster fishery, and the harvest of precious corals and coral reef species—are not jeopardizing the continued existence of any listed species or adversely modifying critical habitat. The biological opinions resulting from these consultations are briefly described below. Implementation of these amendments would not result in any additional measures not previously analyzed. Therefore, the Council believes that there would be no additional impacts to any listed species or habitat.

Biological Opinions

In a biological opinion issued in March 2002, NMFS concluded that the ongoing operation of the Western Pacific Region's botttomfish and seamount fisheries, as managed under the Bottomfish and Seamount Groundfish FMP, was not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify any critical habitat. This determination was made pursuant to section 7 of the ESA. The measures contained in this amendment to the Bottomfish and Seamount Groundfish FMP are not anticipated to significantly change the operations of NWHI fishing vessels targeting bottomfish or seamount groundfish species. Therefore, the Council believes that the proposed bottomfish and seamount groundfish fishing activities under these amendments are not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat.

A biological opinion issued by NMFS in May 1996, concluded that the ongoing operation of the NWHI lobster fishery was not likely to jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify critical habitat. This determination was made pursuant to section 7 of the ESA. The measures contained in this amendment to the Crustaceans FMP would implement a moratorium on the harvest of crustaceans throughout the proposed NWHI sanctuary. Therefore, the Council believes that the proposed crustacean fishing activities under these amendments are not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat.

In a biological opinion issued in October 1978, NMFS concluded that the ongoing operation of the Western Pacific Region's precious coral fisheries was not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat. This determination was made pursuant to section 7 of the ESA. The measures contained in this amendment to the Precious Corals FMP would implement a moratorium on the harvest of precious corals throughout the proposed NWHI sanctuary. Therefore, the Council believes that the proposed precious coral fishing activities under these amendments are not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat.

An informal consultation under section 7 of the ESA was concluded by NMFS on March 7, 2002. As a result of the informal consultation, the NMFS Regional Administrator determined that fishing activities conducted under the Coral Reef Ecosystems FMP are not likely to adversely affect endangered or threatened species or critical habitat under NMFS' jurisdiction. On May 22, 2002, the USFWS concurred with the determination of NMFS that the activities conducted under the Coral Reef Ecosystems FMP are are not likely to adversely affect listed species under USFWS' exclusive jurisdiction (i.e., seabirds and terrestrial plants) and listed species shared with NMFS (i.e., sea turtles). The measures contained in this amendment to the Coral Reef Ecosystems FMP would implement a moratorium on the harvest of coral reef associated species throughout the proposed NWHI sanctuary. Therefore, the Council believes that the proposed coral reef fishing activities under these amendments are not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat.

NMFS issued a biological opinion on February 23, 2004, following a consultation under section 7 of the ESA on the ongoing operation of the Western Pacific Region's pelagic fisheries as managed under the Pelagic FMP. The opinion concluded that the fisheries were not likely to jeopardize the continued existence of any threatened or endangered species under NMFS' jurisdiction or destroy or adversely modify critical habitat that has been designated for them. The measures contained in this amendment to the Pelagic FMP are not anticipated to significantly change the operations of NWHI fishing vessels targeting pelagic species. Therefore, the Council believes the proposed pelagic fishing activities under these amendments are not likely to jeopardize the continued existence of any threatened or endangered species under the jurisdiction of NMFS or the USFWS or destroy or adversely modify critical habitat that has been designated for them.

5.6 Marine Mammal Protection Act

Under section 118 of the Marine Mammal Protection Act (MMPA), NMFS must publish, at least annually, a List of Fisheries (LOF) that classifies U.S. commercial fisheries into one of three categories based on the level of serious injury and mortality of marine mammals that occurs incidental to each fishery. The MMPA mandates that each fishery be classified according to whether it has frequent, occasional, or remote likelihoods of (or no-known) incidental mortality or serious injury to marine mammals.

NMFS uses fishery classification criteria, which consist of a two-tiered, stock-specific approach. This two-tiered approach first addresses the total impact of all fisheries on each marine mammal stock and then addresses the impact of individual fisheries on each stock. This approach is based on the rate, in numbers of animals per year, of incidental mortalities and serious injuries of marine mammals due to commercial fishing operations relative to a stock's Potential Biological Removal (PBR) level. The PBR level is defined in 50 CFR 229.2 as the maximum number of animals, not including natural mortality that may be removed from a stock of marine mammals while allowing that stock to reach or maintain its optimum sustainable population.

Tier 1:
If the total annual mortality and serious injury across all fisheries that interact with a stock is less than or equal to 10 percent of the PBR level of this stock, all fisheries interacting with this stock

would be placed in Category III. Otherwise, these fisheries are subject to the next tier of analysis to determine their classification.

Tier 2:
Category I: Annual mortality and serious injury of a stock in a given fishery is greater than or equal to 50 percent of the PBR level.
Category II: Annual mortality and serious injury of a stock in a given fishery is greater than 1 percent and less than 50 percent of the PBR level.
Category III: Annual mortality and serious injury of a stock in a given fishery is less than or equal to 1 percent of the PBR level.

All of the fisheries conducted in waters within the proposed NWHI sanctuary are listed as Category III (69 FR 48407, August 10, 2004). With the exception of the implementation of moratoriums for the harvest of crustaceans, precious corals and coral reef associated species, and the implementation of no-take marine protected areas, fisheries managed under the Council's FMPs are not expected to change their historical fishing operations or patterns as a result of implementation of these amendments. Therefore, no increased impacts on marine mammals that occur in the waters within the proposed NWHI sanctuary are expected. The regulations governing Category III fisheries (found at 50 CFR 229.5) are listed below:

§ 229.5 Requirements for Category III fisheries.

- (a) *General.* Vessel owners and crew members of such vessels engaged only in Category III fisheries may incidentally take marine mammals without registering for or receiving an Authorization Certificate.
- (b) *Reporting.* Vessel owners engaged in a Category III fishery must comply with the reporting requirements specified in §229.6.
- (c) *Disposition of marine mammals.* Any marine mammal incidentally taken must be immediately returned to the sea with a minimum of further injury unless directed otherwise by NMFS personnel, a designated contractor, or an official observer, or authorized otherwise by a scientific research permit in the possession of the operator.
- (d) *Monitoring.* Vessel owners engaged in a Category III fishery must comply with the observer requirements specified under §229.7(d).
- (e) *Deterrence.* When necessary to deter a marine mammal from damaging fishing gear, catch, or other private property, or from endangering personal safety, vessel owners and crew members engaged in commercial fishing operations must comply with all deterrence provisions set forth in the MMPA and any other applicable guidelines and prohibitions.
- (f) *Self-defense.* When imminently necessary in self-defense or to save the life of a person in immediate danger, a marine mammal may be lethally taken if such taking is reported to NMFS in accordance with the requirements of §229.6.
- (g) *Emergency regulations.* Vessel owners engaged in a Category III fishery must comply with any applicable emergency regulations.

5.7 National Environmental Policy Act

To assess the impacts on the human environment that may result from the proposed action. Chapters 2 through 4 of this document have been prepared as an environmental assessment (EA) in accordance with the requirements of the National Environmental Policy Act of 1969. Also included by reference in the EA from other sections of this document as they are indicated in the Table of Contents are the cover sheet, table of contents, list of preparers, list of agencies, list of references, public review process and schedule, as well as the discussion of the purpose and need for action.

5.8 Paperwork Reduction Act

The purpose of the Paperwork Reduction Act (PRA) is to minimize the burden on the public by ensuring that any information requirements are needed and are carried out in an efficient manner (44 U.S.C. 350191(1)). New information requirements in these amendments are detailed in Table 33 below

Table 33. New Information Requirements for Fishery Participants.

Affected group	New MSA permit	New MSA logbook
All recreational (i.e. non-commercial) fishery participants	YES	YES (except for Midway Atoll-based operations)
Commercial pelagic fishery participants	YES	YES
Commercial bottomfish fishery participants	NO (already subject to this requirement)	YES

5.9 Regulatory Flexibility Act

In order to meet the requirements of the Regulatory Flexibility Act (RFA), 5 U.S.C. 601 et seq. requires government agencies to assess the impact of their regulatory actions on small businesses and other small entities via the preparation of regulatory flexibility analyses. The RFA requires government agencies to assess the impact of significant regulatory actions on small businesses and other small organizations. Please see Appendix A for the Initial Regulatory Flexibility Analysis for these amendments.

5.10 Executive Order 12866

In order to meet the requirements of Executive Order 12866 (E.O. 12866), NMFS requires that a Regulatory Impact Review 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 the proposed action, 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. In accordance with E.O. 12866, the following is set forth by the Council: (1) This rule is not likely to have an annual effect on the economy of more than $100 million, but it may adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; (2) This rule is not likely to create any serious inconsistencies or otherwise interfere with any action taken or planned by another agency; (3) This rule is not likely to materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights or obligations of recipients thereof; (4) This rule is not likely to raise novel or policy issues arising out of legal mandates, or the principles set forth in the Executive Order; (5) This rule is controversial. Please see Appendix A for the Regulatory Impact Review for these amendments.

5.11 Data Quality Act

To the extent possible, this information complies with the Data Quality Act and NOAA standards (NOAA Information Quality Guidelines, September 30, 2002) that recognize information quality is composed of three elements: utility, integrity, and objectivity. Central to the preparation of this regulatory amendment is objectivity that consists of two distinct elements: presentation and substance. The presentation element includes whether disseminated information is presented in an accurate, clear, complete, and unbiased manner and in a proper context. The substance element involves a focus on ensuring accurate, reliable, and unbiased information. In a scientific, financial, or statistical context, the original and supporting data shall be generated, and the analytic results shall be developed, using sound statistical and research methods.

At the same time, however, the federal government has recognized that "information quality comes at a cost." In this context, agencies are required to weigh the costs and the benefits of higher information quality in the development of information, and the level of quality to which the information disseminated will be held" (OMB Guidelines, pp. 8452–8453).

One of the important potential costs in acquiring "perfect" information (which is never available), is the cost of delay in decision- making. While the precautionary principle suggests that decisions should be made in favor of the environmental amenity at risk (in this case, marine ecosystems), this does not suggest that perfect information is required for management and conservation measures to proceed. In brief, it does suggest that caution be taken but that it not lead to paralysis until perfect information is available. This document has used the best available information and made a broad presentation of it. The process of public review of this document provides an opportunity for comment and challenge to this information, as well as for the provision of additional information.

5.12 Executive Order 13112

Executive Order 13112 requires agencies to use authorities to prevent introduction of invasive species, respond to, and control invasions in a cost effective and environmentally sound manner, and to provide for restoration of native species and habitat conditions in ecosystems that have been invaded. Executive Order 13112 also provides that agencies shall not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the U.S. or elsewhere unless a determination is made that the benefits of such actions clearly outweigh the potential harm, and that all feasible and prudent measures to minimize the risk of harm will be taken in conjunction with the actions. The Council has adopted several recommendations to increase the knowledge base of issues surrounding potential introductions of invasive species into waters included in these amendments. The first recommendation is to conduct invasive species risk assessments by characterizing the shipping industry, including fishing, cargo, military, and cruise ships throughout the Western Pacific Region. This assessment will include a comparative analysis of the risk posed by U.S. fishing vessels in the western Pacific with other vectors of marine invasive species. The second recommendation is to develop a component in the Council's existing education program to educate fishermen on invasive species issues and inform the fishing industry of methods to minimize and mitigate the potential for inadvertent introduction of alien species to island ecosystems.

5.13 Executive Order 13089

In June 1998 the President signed an Executive Order for Coral Reef Protection, which established the Coral Reef Task Force (CRTF) and directed all federal agencies with coral reef-related responsibilities to develop a strategy for coral reef protection. Federal agencies were directed to work cooperatively with state, territorial, commonwealth, and local agencies; non-governmental organizations; the scientific community; and commercial interests to develop the plan. The Task Force was directed to develop and implement a comprehensive program of research and mapping to inventory, monitor, and address the major causes and consequences of degradation of coral reef ecosystems. The Order directs federal agencies to use their authorities to protect coral reef ecosystems and, to the extent permitted by law, prohibits them from authorizing, funding, or carrying out any actions that will degrade these ecosystems.

Of particular interest to the Council is the implementation of measures to address: (1) fishing activities that may degrade coral reef ecosystems, such as overfishing, which could affect ecosystem processes (e.g., the removal of herbivorous fishes leading to the overgrowth of corals by algae) and destroy the availability of coral reef resources (e.g., extraction of spawning aggregations of groupers); (2) destructive fishing techniques, which can degrade EFH and are thereby counter to the Magnuson-Stevens Act; (3) removal of reef substrata; and (4) discarded and/or derelict fishing gear, which can degrade EFH and cause "ghost fishing."

To meet the requirements of Executive Order 13089, the Coral Reef Task Force issued the National Action Plan to Conserve Coral Reefs in March 2000. In response to the recommendations outlined in the Action Plan, the President announced Executive Order 13158, which is designed to strengthen and expand Marine Protected Areas.

6.0 CHAPTER SIX: DRAFT REGULATIONS

Subpart A—General

§ 660.1 Purpose and scope.

(a) The regulations in this part govern fishing for Western Pacific and West Coast fishery management unit species by vessels of the United States that operate or are based inside the outer boundary of the EEZ off Western Pacific and West Coast States.

(b) General regulations governing fishing by all vessels of the United States and by fishing vessels other than vessels of the United States are contained in part 600 of this chapter.

(c) Regulations governing the harvest, possession, landing, purchase, and sale of shark fins are found at part 600, subpart N, of this chapter.

§ 660.2 Relation to other laws.

NMFS recognizes that any state law pertaining to vessels registered under the laws of that state while operating in the fisheries regulated under this part, and that is consistent with this part and the FMPs implemented by this part, shall continue in effect with respect to fishing activities regulated under this part.

§ 660.3 Reporting and recordkeeping.

Except for fisheries subject to subparts D and F of this part, any person who is required to do so by applicable state law or regulation must make and/or file all reports of management unit species landings containing all data and in the exact manner required by applicable state law or regulation.

Subpart B—Western Pacific Fisheries—General

§ 660.11 Purpose and scope.

(a) This subpart contains regulations that are common to all Western Pacific fisheries managed under fishery management plans prepared by the Western Pacific Regional Fishery Management Council under the Magnuson Act.

(b) Regulations specific to individual fisheries are included in subparts C, D, E, F, and J of this part.

(c) Nothing in subparts C, D, E, F, and J of this part is intended to supercede any valid state or Federal regulations that are more restrictive than those published here.

§ 660.12 Definitions.

In addition to the definitions in the Magnuson-Stevens Act, and in §600.10, the terms used in subparts B through F and subpart J of this part have the following meanings:

American Samoa longline limited access permit means the permit required by §660.21 to use a vessel shoreward of the outer boundary of the EEZ around American Samoa to fish for Pacific pelagic management unit species using longline gear or to land or transship Pacific pelagic management unit species that were caught in the EEZ around American Samoa using longline gear.

American Samoa pelagics mailing list means the list maintained by the Pacific Islands Regional Office of names and mailing addresses of parties interested in receiving notices of availability for American Samoa longline limited access permits.

Basket-style longline gear means a type of longline gear that is divided into units called “baskets” each consisting of a segment of main line to which 10 or more branch lines with hooks are spliced. The mainline and all branch lines are made of multiple braided strands of cotton, nylon, or other synthetic fibers impregnated with tar or other heavy coatings that cause the lines to sink rapidly in seawater.

Bottomfish FMP means the Fishery Management Plan for Bottomfish and Seamount Groundfish of the Western Pacific Region.

Bottomfish management area means the areas designated in §660.69.

Bottomfish management unit species means the following fish:

Common name	Local name	Scientific name
Snappers:		
Silver jaw jobfish..........	Lehi (H); palu-gustusilvia (S).	Aphareus rutilans.
Gray jobfish................	Uku (H); asoama (S).	Aprion virescens.
Squirrelfish snapper........	Ehu (H); palu-malau (S).	Etelis carbunculus.
Longtail snapper............	Onaga, ula'T1ula (H); palu-loa (S).	Etelis coruscans.
Blue stripe snapper.........	Ta'ape (H); savane (S); funai (G).	Lutjanus kasmira.
Yellowtail snapper..........	Palu-i' lusama (S); yellowtail kalekale.	Pristipomoides auricilla.
Pink snapper................	Opakapaka (H); palu-'Tlena'lena (S); gadao (G).	Pristipomoides.

Yelloweye snapper...........	Palusina (S); yelloweye opakapaka.	Pristipomoides flavipinnis.
Snapper.....................	Kalekale (H)......	Pristipomoides sieboldii.
Snapper.....................	Gindai (H,G); palusega (S).	Pristipomoides zonatus.
Jacks:		
Giant trevally..............	White ulua (H); tarakito (G); sapo-anae (S).	Caranx ignoblis.
Black jack..................	Black ulua (H); tarakito (G); tafauli (S).	Caranx lugubris.
Thick lipped trevally.......	Pig ulua (H); butaguchi (H).	Pseudocaranx dentex.
Amberjack...................	Kahala (H)........	Seriola dumerili.
Groupers:		
Blacktip grouper............	Fausi (S); gadau (G).	Epinephelus fasciatus.
Sea bass....................	Hapu' 1upu'u (H)..	Epinephelus quernus.
Lunartail grouper...........	Papa (S)..........	Variola louti.
Emperor fishes:		
Ambon emperor...............	Filoa-gutumumu (S)	Lethrinus amboinensis.
Redgill emperor.............	Filoa-pa'lo'omumu (S); mafuti (G).	Lethrinus rubrioperculatus.

Notes: G_Guam; H_Hawaii; S_American Samoa.

Carapace length means a measurement in a straight line from the ridge between the two largest spines above the eyes, back to the rear edge of the carapace of a spiny lobster (see Figure 1 of this part).

Circle hook means a fishing hook with the point turned perpendicularly back towards the shank.

Commercial fishing means fishing in which the fish harvested, either in whole or in part, are intended to enter commerce or enter commerce through sale, barter or trade.

Commonwealth of the Northern Mariana Islands (CNMI) means Northern Mariana Islands.

CNMI offshore area means the portion of the U.S. EEZ around the CNMI extending seaward from a line drawn 3 nautical miles from the baseline around the CNMI from which the territorial sea is measured, to the outer boundary of the U.S. EEZ, which to the south means those points which are equidistant between Guam and the island of Rota in the CNMI.

Council means the Western Pacific Regional Fishery Management Council.

Coral reef ecosystem management unit species (Coral reef ecosystem MUS) means all of the Currently Harvested Coral Reef Taxa listed in Table 3 and Potentially Harvested Coral Reef Taxa listed Table 4 of this part and which spend the majority of their non-pelagic (post-settlement) life stages within waters less than or equal to 50 fathoms in total depth.

Coral reef ecosystem regulatory area means the U.S. EEZ waters around American Samoa, Guam, Hawaii, CNMI and the PRIA except for the portion of EEZ waters 0–3 miles around the CNMI, and EEZ waters around the NWHI west of 160°50'W. long.

Crustaceans FMP means the Fishery Management Plan for Crustacean Fisheries of the Western Pacific Region.

Crustaceans management area means the combined portions of the EEZ encompassed by Crustaceans Permit Areas 1, 2, and 3.

Crustaceans management unit species means spiny lobster (*Panulirus marginatus* or *Panulirus penicillatus*), slipper lobster (family *Scyllaridae*), and Kona crab (*Ranina ranina*).

Crustaceans Permit Area 1 (Permit Area 1) means the EEZ off the Northwestern Hawaiian Islands with the exception of those waters within the Northwestern Hawaiian Islands National Marine Sanctuary.

Crustaceans Permit Area 2 (Permit Area 2) means the EEZ off the main Hawaiian Islands.

Crustaceans Permit Area 3 (Permit Area 3) means the EEZ of the Territory of Guam and the EEZ of the Territory of American Samoa.

Crustaceans Permit Area 1 VMS Subarea means an area within the EEZ off the NWHI 50 nm from the center geographical positions of the islands and reefs in the NWHI as follows: Nihoa Island 23°05' N. lat., 161°55' W. long.; Necker Island 23°35' N. lat., 164°40' W. long.; French Frigate Shoals 23°45' N. lat., 166°15' W. long; Garner Pinnacles 25°00' N. lat., 168°00' W. long.; Maro Reef 25°25' N. lat., 170°35' W. long.; Laysan Island 25°45' N. lat., 171°45' W. long; Lisianski Island 26°00' N. lat., 173°55' W. long.; Pearl and Hermes Reef 27°50' N. lat., 175°50' W. long.; Midway Islands 28°14' N. lat., 177°22' W. long.; and Kure Island 28°25' N. lat., 178°20' W. long. The remainder of the VMS subarea is delimited by parallel lines tangent to and connecting the 50–nm areas around the following: from Nihoa Island to Necker Island; from French Frigate Shoals to Gardner Pinnacles; from Gardner Pinnacles to Maro Reef; from Laysan Island to Lisianski Island; and from Lisianski Island to Pearl and Hermes Reef.

Crustaceans receiving vessel means a vessel of the United States to which lobster taken in Permit Area 1 are transferred from another vessel.

Currently harvested coral reef taxa (CHCRT) means coral reef associated species, families, or subfamilies, as described in Table 3 of this part, that have annual landings greater than 454.54 kg

(1,000 lb) as reported on individual state, commonwealth, or territory catch reports or through creel surveys. Fisheries and research data from many of these species have been analyzed by regional management agencies.

Dead coral means any precious coral that no longer has any live coral polyps or tissue.

Deep-set or Deep-setting means the deployment of, or deploying, respectively, longline gear in a manner consistent with all the following criteria: with all float lines at least 20 meters in length; with a minimum of 15 branch lines between any two floats (except basket-style longline gear which may have as few as 10 branch lines between any two floats); without the use of light sticks; and resulting in the possession or landing of no more than 10 swordfish (Xiphias gladius) at any time during a given trip. As used in this definition “float line” means a line used to suspend the main longline beneath a float and “light stick” means any type of light emitting device, including any fluorescent “glow bead”, chemical, or electrically powered light that is affixed underwater to the longline gear.

EFP means an experimental fishing permit.

First level buyer means:

(1) The first person who purchases, with the intention to resell, management unit species, or portions thereof, that were harvested by a vessel that holds a permit or is otherwise regulated under subpart D of this part; or

(2) A person who provides recordkeeping, purchase, or sales assistance in the first transaction involving management unit species (such as the services provided by a wholesale auction facility).

Fish dealer means any person who:

(1) Obtains, with the intention to resell, Pacific pelagic management unit species, or portions thereof, that were harvested or received by a vessel that holds a permit or is otherwise regulated under subpart E of this part; or

(2) Provides recordkeeping, purchase, or sales assistance in obtaining or selling such management unit species (such as the services provided by a wholesale auction facility).

Fishing gear, as used in subpart D of this part, includes:

(1) *Bottom trawl,* which means a trawl in which the otter boards or the footrope of the net are in contact with the sea bed.

(2) *Gillnet,* (see §600.10).

(3) *Hook-and-line,* which means one or more hooks attached to one or more lines.

(4) *Set net,* which means a stationary, buoyed, and anchored gill net.

(5) *Trawl,* (see §600.10).

Fishing trip means a period of time during which fishing is conducted, beginning when the vessel leaves port and ending when the vessel lands fish.

Fishing year means the year beginning at 0001 local time on January 1 and ending at 2400 local time on December 31.

Freeboard means the straight-line vertical distance between a vessel's working deck and the sea surface. If the vessel does not have gunwale door or stern door that exposes the working deck, freeboard means the straight-line vertical distance between the top of a vessel's railing and the sea surface.

Harvest guideline means a specified numerical harvest objective.

Hawaiian Archipelago means the Main and Northwestern Hawaiian Islands, including Midway Atoll.

Hawaii longline limited access permit means the permit required by §660.21 to use a vessel to fish for Pacific pelagic management unit species with longline gear in the EEZ around Hawaii or to land or transship longline-caught Pacific pelagic management unit species shoreward of the outer boundary of the EEZ around Hawaii.

Hookah breather means a tethered underwater breathing device that pumps air from the surface through one or more hoses to divers at depth.

Ho'omalu Zone limited access permit means the permit required to fish commercially for bottomfish management unit species within the Ho'omalu Zone bottomfish management subarea described in § 660.69(a)(2)(i).

Incidental catch or *incidental species* means species caught while fishing for the primary purpose of catching a different species.

Interested parties means the State of Hawaii Department of Land and Natural Resources, the Council, holders of permits issued under subpart D of this part, and any person who has notified the Regional Administrator of his or her interest in the procedures and decisions described in §§660.51 and 660.52, and who has specifically requested to be considered an "interested party."

Land or *landing* means offloading fish from a fishing vessel, arriving in port to begin offloading fish, or causing fish to be offloaded from a fishing vessel.

Large vessel means, as used in §§ 660.22, 660.37, and 660.38, any vessel greater than 50 ft (15.2 m) in length overall.

Length overall (LOA) or length of a vessel means, as used in §§ 660.21(i) and 660.22, the horizontal distance, rounded to the nearest foot (with any 0.5 foot or 0.15 meter fraction rounded upward), between the foremost part of the stem and the aftermost part of the stern, excluding bowsprits, rudders, outboard motor brackets, and similar fittings or attachments (see Figure 2 to this part). "Stem" is the foremost part of the vessel, consisting of a section of timber or fiberglass, or cast forged or rolled metal, to which the sides of the vessel are united at the fore end, with the lower end united to the keel, and with the bowsprit, if one is present, resting on the upper end. "Stern" is the aftermost part of the vessel.

Live coral means any precious coral that has live coral polyps or tissue.

Live rock means any natural, hard substrate, including dead coral or rock, to which is attached, or which supports, any living marine life-form associated with coral reefs.

Lobster closed area means an area of the EEZ that is closed to fishing for lobster.

Longline fishing prohibited area means the portions of the EEZ in which longline fishing is prohibited as specified in §660.26.

Longline fishing vessel means a vessel that has longline gear on board the vessel.

Longline gear means a type of fishing gear consisting of a main line that exceeds 1 nm in length, is suspended horizontally in the water column either anchored, floating, or attached to a vessel, and from which branch or dropper lines with hooks are attached; except that, within the protected species zone, longline gear means a type of fishing gear consisting of a main line of any length that is suspended horizontally in the water column either anchored, floating, or attached to a vessel, and from which branch or dropper lines with hooks are attached.

Low use marine protected area (MPA) means an area of the U.S. EEZ where fishing operations have specific restrictions in order to protect the coral reef ecosystem, as specified under area restrictions.

Main Hawaiian Islands means the islands of the Hawaiian Islands Archipelago lying to the east of 161° W. long.

Mau Zone limited access permit means the permit required to fish commercially for bottomfish management unit species with the Mau Zone bottomfish management subarea described in § 660.69(a)(2)(ii).

Mau Zone Western Pacific Community Development Program Limited Access Permit means the permit required for an authorized community to fish for, take, or retain bottomfish management unit species in the Mau Zone bottomfish management subarea described in § 660.69(a)(2)(ii).

Non-precious coral means any species of coral other than those listed under the definition for precious coral in this section.

Non-selective gear means any gear used for harvesting corals that cannot discriminate or differentiate between types, size, quality, or characteristics of living or dead corals.

Northwestern Hawaiian Islands (NWHI) means the islands of the Hawaiian Islands Archipelago lying to the west of 161° W. long.

Northwestern Hawaiian Islands National Marine Sanctuary (NWHI National Marine Sanctuary) means the federal waters within 50 miles around the following islands of the NWHI as measured from the following coordinates: Nihoa Island 23°05' N. lat., 161°55' W. long.; Necker Island 23°35' N. lat., 164°40' W. long.; French Frigate Shoals 23°45' N. lat., 166°15' W. long.; Gardner Pinnacles 25°00' N. lat., 168°00' W. long.; Maro Reef 25°25' N. lat., 170°35' W. long.; Laysan Island 25°45' N. lat., 171°45' W. long.; Lisianski Island 26°00' N. lat., 173°55' W. long.; Pearl and Hermes Reef 27°50' N. lat., 175°50' W. long.; Midway Island 28°14' N. lat., 177°22' W. long.; and Kure Island 28°25' N. lat., 178°20' W. long.

Northwestern Hawaiian Islands National Marine Sanctuary commercial pelagic permit means the permit required to use a vessel to fish commercially for Pacific pelagic management unit species shoreward of the outer boundary of the NWHI National Marine Sanctuary.

Northwestern Hawaiian Islands National Marine Sanctuary recreational permit means the permit required to use a vessel to fish non-commercially for any species shoreward of the outer boundary of the NWHI National Marine Sanctuary.

No-take MPA means an area of the U.S. EEZ that is closed to fishing for or harvesting of management unit species, precious corals and seamount groundfish, as defined in this section.

Offloading means removing management unit species from a vessel.

Offset circle hook means a circle hook in which the barbed end of the hook is displaced relative to the parallel plane of the eyed-end, or shank, of the hook when laid on its side.

Owner, as used in subparts C and D of this part and §660.61(i) through (m), means a person who is identified as the current owner of the vessel as described in the Certificate of Documentation (Form CG–1270) issued by the USCG for a documented vessel, or in a registration certificate issued by a state, a territory, or the USCG for an undocumented vessel. As used in subpart F of this part and §660.61(c) through (h), the definition of "owner" in §600.10 of this chapter continues to apply.

Pacific Pelagic Management Unit Species means the following fish:

Common name	Scientific name
Mahimahi (dolphinfish)	Coryphaena spp.
Indo-Pacific blue marlin	Makaira mazara
Black marlin	M. indica
Striped marlin	Tetrapturus audax
Shortbill spearfish	T. angustirostris
Swordfish	Xiphias gladius
Sailfish	Istiophorus platypterus
Pelagic thresher shark	Alapias pelagicus
Bigeye thresher shark	Alopias
Common thresher shark	Alopias vulpinus
Silky shark	Carcharhinus falciformis
Oceanic whitetip shark	Carcharhinus longimanus
Blue shark	Prionace glauca
Shortfin mako shark	Isurus oxyrinchus
Longfin mako shark	Isurus paucus
Salmon shark	Lamna ditropis
Albacore	Thunnus alalunga
Bigeye tuna	T. obesus
Yellowfin tuna	T. albacore
Northern bluefin tuna	T. thynnus
Skipjack tuna	Katsuwonus pelamis
Kawakawa	Euthynnus affinis
Wahoo	Acanthocybium solandri
Moonfish	Lampris spp.
Oilfish family	Gempylidae
Pomfret	family Bramidae
Other tuna relatives	Auxis spp., Scomber spp.; Allothunus spp.

Pacific Islands Regional Office (PIRO) means the headquarters of the Pacific Islands Region, NMFS, located at 1601 Kapiolani Blvd., Suite 1110, Honolulu, Hawaii 96814; telephone number (808) 973–2937.

Pacific Remote Island Areas (PRIA) pelagic troll and handline fishing permit means the permit required by §660.21 to use a vessel shoreward of the outer boundary of the EEZ around the PRIA to fish for Pacific pelagic management unit species using pelagic handline or troll fishing methods.

Pacific remote island areas (PRIA, or U.S. island possessions in the Pacific Ocean) means Palmyra Atoll, Kingman Reef, Jarvis Island, Baker Island, Howland Island, Johnston Atoll, Wake Island, and Midway Atoll.

Pelagic handline fishing means fishing for pelagic management unit species from a stationary or drifting vessel using hook and line gear other than longline gear.

Pelagic troll fishing (trolling) means fishing for pelagic management unit species from a moving vessel using hook and line gear.

Pelagics FMP means the Fishery Management Plan for the Pelagic Fisheries of the Western Pacific Region.

Potentially harvested coral reef taxa (PHCRT) means coral reef associated species, families, or subfamilies, as listed in Table 4 of this part, for which little or no information is available beyond general taxonomic and distribution descriptions. These species have either not been caught in the past or have been harvested annually in amounts less than 454.54 kg (1,000 lb). Coral reef ecosystem management unit species that are not listed as management unit species, precious corals, seamount groundfish, as defined in this section, or listed as CHCRT in Table 3 of this part.

Precious coral means any coral of the genus *Corallium* in addition to the following species of corals:

Common name	Scientific name
Pink coral (also known as red coral)......	Corallium secundum.
Pink coral (also known as red coral)......	Corallium regale.
Pink coral (also known as red coral)......	Corallium laauense.
Gold coral................................	Gerardia spp.
Gold coral................................	Callogorgia gilberti.
Gold coral................................	Narella spp.
Gold coral................................	Calyptrophora spp.
Bamboo coral..............................	Lepidisis olapa.
Bamboo coral..............................	Acanella spp.
Black coral...............................	Antipathes dichotoma.
Black coral...............................	Antipathes grandis.
Black coral...............................	Antipathes ulex.

Precious coral permit area means the area encompassing the precious coral beds in the management area. Each bed is designated by a permit area code and assigned to one of the following four categories:

(1) *Established beds.* Makapuu (Oahu), Permit Area E-B-1, includes the area within a radius of 2.0 nm of a point at 21°18.0' N. lat., 157°32.5' W. long.

(2) *Conditional beds.* (i) Keahole Point (Hawaii), Permit Area C-B-1, includes the area within a radius of 0.5 nm of a point at 19°46.0' N. lat., 156°06.0' W. long.

(ii) Kaena Point (Oahu), Permit Area C-B-2, includes the area within a radius of 0.5 nm of a point at 21°35.4' N. lat., 158°22.9' W. long.

(4) *Exploratory areas.* (1) Permit Area X-P-H includes all coral beds, other than established beds, conditional beds, or refugia, in EEZ waters around Hawaii seaward of the State of Hawaii, with the exception of those waters within the Northwestern Hawaiian Islands National Marine Sanctuary

(ii) Permit Area X-P-AS includes all coral beds, other than established beds, conditional beds, or refugia, in the EEZ seaward of American Samoa.

(iii) Permit Area X-P-G includes all coral beds, other than established beds, conditional beds, or refugia, in the EEZ seaward of Guam.

(iv) Permit Area X-P-PI includes all coral beds, other than established beds, conditional beds, or refugia, in the EEZ seaward of the U.S. Pacific Island possessions.

Protected species means an animal protected under the MMPA, listed under the ESA, or subject to the Migratory Bird Treaty Act, as amended.

Protected species study zones means the waters within a specified distance, designated by the Regional Administrator pursuant to §660.66, around the following islands of the NWHI and as measured from the following coordinates: Nihoa Island 23°05' N. lat., 161°55' W. long.; Necker Island 23°35' N. lat., 164°40' W. long.; French Frigate Shoals 23°45' N. lat., 166°15' W. long.; Gardner Pinnacles 25°00' N. lat., 168°00' W. long.; Maro Reef 25°25' N. lat., 170°35' W. long.; Laysan Island 25°45' N. lat., 171°45' W. long.; Lisianski Island 26°00' N. lat., 173°55' W. long.; Pearl and Hermes Reef 27°50' N. lat., 175°50' W. long.; Midway Island 28°14' N. lat., 177°22' W. long.; and Kure Island 28°25' N. lat., 178°20' W. long. The protected species study zones encompasses waters within 50 nm of the geographical coordinates listed above.

Protected species zone means an area, designated under §660.26, measured from the center geographical positions of certain islands and reefs in the NWHI, as follows: Nihoa Island 23°05' N. lat., 161°55' W. long.; Necker Island 23°35' N. lat., 164°40' W. long.; French Frigate Shoals 23°45' N. lat., 166°15' W. long; Gardner Pinnacles 25°00' N. lat., 168°00' W. long.; Maro Reef 25°25' N. lat., 170°35' W. long.; Laysan Island 25°45' N. lat., 171°45' W. long; Lisianski Island 26°00' N. lat., 173°55' W. long.; Pearl and Hermes Reef 27°50' N. lat., 175°50' W. long.; Midway Islands 28°14' N. lat., 177°22' W. long.; and Kure Island 28°25' N. lat., 178°20' W. long. Where the areas are not contiguous, parallel lines drawn tangent to and connecting those semi-circles of the 50-nm areas that lie between Nihoa Island and Necker Island, French Frigate Shoals and Gardner Pinnacles, Gardner Pinnacles and Maro Reef, and Lisianski Island and Pearl and Hermes Reef, shall delimit the remainder of the protected species zone.

Receiving vessel permit means a permit required by §660.21(c) for a receiving vessel to transship or land Pacific pelagic management unit species taken by other vessels using longline gear.

Regional Administrator means Director, Pacific Islands Region, NMFS (*see* Table 1 of §600.502 for address).

Seamount groundfish means the following species:

Common name	Scientific name
Armorhead	Pentaceros richardsoni.
Alfonsin	Beryx splendens.
Raftfish	Hyperoglyphe japonica.

Selective gear means any gear used for harvesting corals that can discriminate or differentiate between type, size, quality, or characteristics of living or dead corals.

Shallow-set or Shallow-setting means the deployment of, or deploying, respectively, longline gear in a manner that does not meet the definition of deep-set or deep-setting as defined in this section.

Shallow-set certificate means an original paper certificate that is issued by NMFS and valid for one shallow-set of longline gear (more than one nautical mile of deployed longline gear is a complete set) for sets that start during the period of validity indicated on the certificate.

Special Agent-In-Charge (SAC) means the Special-Agent-In-Charge, NMFS, Pacific Islands Enforcement Division, or a designee of the SAC, located at 300 Ala Moana Blvd., Suite 7–118, Honolulu, Hawaii, 96850; telephone number (808) 541–2727.

Special permit means a permit issued to allow fishing for coral reef ecosystem management unit species in low-use MPAs or to fish for any PHCRT.

Transship means offloading or otherwise transferring management unit species or products thereof to a receiving vessel.

Trap means a box-like device used for catching and holding lobsters.

U.S. harvested corals means coral caught, taken, or harvested by vessels of the United States within any fishery for which a fishery management plan has been implemented under the Magnuson Act.

Vessel monitoring system unit (VMS unit) means the hardware and software owned by NMFS, installed on vessels by NMFS, and required by subpart C of this part to track and transmit the positions of longline vessels or the hardware and software used by vessels to track and transmit the positions of vessels permitted under subpart D of this part to fish in Crustaceans Permit Area 1.

Western Pacific Fishery Management Area means those waters shoreward of the outer boundary of the EEZ around American Samoa, Guam, Hawaii, the Northern Mariana Islands, Midway, Johnston and Palmyra Atolls, Kingman Reef, and Wake, Jarvis, Baker, and Howland Islands.

Western Pacific general longline permit means the permit authorized under §660.21 to use a vessel shoreward of the outer boundary of the EEZ around Guam, the Northern Mariana Islands, Johnston or Palmyra Atolls, Kingman Reef, or Wake, Jarvis, Baker or Howland Islands to fish for Pacific pelagic management unit species using longline gear or to land or to transship Pacific pelagic management unit species that were caught using longline gear.

§ 660.13   Permits and fees.

(a) *Applicability.* The requirements for permits for specific Western Pacific fisheries are set forth in subparts C, D, E, F and J of this part.

(b) *Validity.* Each permit is valid for fishing only in the specific fishery management areas identified on the permit.

(c) *Application.* (1) A Western Pacific Federal Fisheries Permit Application Form may be obtained from the NMFS PIRO to apply for a permit or permits to operate in any of the fisheries regulated under subparts C, D, E, F, and J of this part. The completed application must be submitted to PIRO. In no case shall PIRO accept an application that is not on the Western Pacific Federal Fisheries Application Form.

(2) A minimum of 15 days after the day PIRO receives a complete application should be allowed for processing a permit application for fisheries under subparts C, D, E, and F of this part. A minimum of 60 days after the day PIRO receives a complete application should be allowed for processing a permit application for fisheries under subpart J of this part. If an incomplete or improperly completed application is filed, the applicant will be sent a letter of notice of deficiency. If the applicant fails to correct the deficiency within 30 days following the date of the letter of notification of deficiency, the application will be considered abandoned.

(d) *Change in application information.* Any change in the permit application information or vessel documentation, submitted under paragraph (c) of this section, must be reported to PIRO in writing within 15 days of the change to avoid a delay in processing the permit application. A minimum of 10 days from the day the information is received by PIRO should be given for PIRO to record any change in information from the permit application submitted under paragraph (c) of this section. Failure to report such changes may result in a delay in processing an application, permit holders failing to receive important notifications, or sanctions pursuant to the Magnuson-Stevens Act at 16 U.S.C. §1858(g) or 15 CFR part 904, subpart D.

(e) *Issuance.* After receiving a complete application, the Regional Administrator will issue a permit to an applicant who is eligible under §§660.21, 660.36, 660.41, 660.61, 660.601, or 660.8, or 660.602 as appropriate.

(f) *Fees.* (1) PIAO will not charge a fee for a permit issued under subpart D or F of this part, or for a Ho'omalu Zone limited access permit issued under §660.61.

(2) PIRO will charge a fee for each application for a Hawaii longline limited access permit, Mau Zone limited access permit, coral reef ecosystem special permit, or a American Samoa longline limited access permit (including permit transfers and renewals). The amount of the fee is calculated in accordance with the procedures of the NOAA Finance Handbook, for determining the administrative costs of each special product or service. The fee may not exceed such costs and is specified with each application form. The appropriate fee must accompany each application. Failure to pay the fee will preclude the issuance, transfer or renewal of a Hawaii longline limited access permit, Mau Zone limited access permit, coral reef ecosystem special permit, or an American Samoa longline limited access permit.

(g) *Expiration.* (1) Permits issued under subparts C, D, E, F, and J of this part are valid for the period specified on the permit unless transferred, revoked, suspended, or modified under 15 CFR part 904.

(2) Permits issued under subpart E of this part expire at 2400 local time on December 31.

(h) *Replacement.* Replacement permits may be issued, without charge, to replace lost or mutilated permits. An application for a replacement permit is not considered a new application.

(i) *Transfer.* An application for a permit transfer under §§660.21(h), 660.41(e), or 660.61(e), or for registration of a permit for use with a replacement vessel under §660.61(k), must be submitted to the PIAO as described in paragraph (c) of this section.

(j) *Alteration.* Any permit that has been altered, erased, or mutilated is invalid.

(k) *Display.* Any permit issued under this subpart, or a facsimile of the permit, must be on board the vessel at all times while the vessel is fishing for, taking, retaining, possessing, or landing management unit species shoreward of the outer boundary of the fishery management area. Any permit issued under this section must be displayed for inspection upon request of an authorized officer.

(l) *Sanctions.* Procedures governing sanctions and denials are found at subpart D of 15 CFR part 904.

(m) *Permit appeals.* Procedures for appeals of permit and administrative actions are specified in the relevant subparts of this part.

(n) *Mau Zone Western Pacific Community Development Program Permits.* To qualify for a Western Pacific Community Development Program permit, a community must meet the following eligibility criteria:.

(i) The community must be located in Hawaii;

(ii) The community must consist of community residents descended from aboriginal people indigenous to Hawaii who conducted commercial or subsistence fishing using traditional fishing practices in the waters of Hawaii;

(iii) The community must consist of community residents who reside in their ancestral homeland;

(iv) The community must have knowledge of customary practices relevant to fisheries in Hawaii;

(v) The community must have a traditional dependence on fisheries of Hawaii;

(vi) The community must have experienced or be experiencing economic or other barriers that prevent full participation in Western Pacific fisheries and, in recent years, have not had harvesting, processing, or marketing capability sufficient to support substantial participation in fisheries in Hawaii;

(vii) The community must develop and submit a Community Development Plan to the Western Pacific Regional Fishery Management Council and the National Marine Fisheries Service; and

(viii) The Community Development Plan must describe how the community organization meets the eligibility criteria listed above as well as:

(A) provide community organization information, including name, charter, bylaws, board members, and a designated community member who would hold and fish under the permit;

(B) describe the community organization's plan for using the permit, including a general description of the vessel and equipment that would be used, including fishing gear, navigational equipment, safety equipment and operating patterns; and

(C) describe the anticipated benefits to the community organization, general public or other entities that may be affected and include a description of how the plan would increase community access, either directly or indirectly, to fishery resources.

(ix) The Regional Administer in coordination with the Western Pacific Regional Fishery Management Council will determine, based on the submitted Community Development Plan, if the community qualifies to be eligible for a Western Pacific Community Development Program permit.

(o) A fishing vessel of the United States must be registered with a valid Northwestern Hawaiian Islands National Marine Sanctuary recreational permit if that vessel is used to fish non-commercially for any fish species shoreward of the outer boundary of the NWHI National Marine Sanctuary. The Regional Administrator shall issue a Northwestern Hawaiian Islands

National Marine Sanctuary recreational permit in accordance with the criteria and procedures specified in this section.

(i) *Issuance.*

(A) If an application contains all of the required information, the Regional Administrator will forward copies of the application within 30 days to the Council, the U.S. Coast Guard, the fishery management agency of the affected state, and other interested parties who have identified themselves to the Council.

(B) Within 60 days following receipt of a complete application, the Regional Administrator will consult with the Council through its Executive Director, and the Director of the affected state fishery management agency concerning the permit application and will receive their recommendations for approval or disapproval of the application based on:

(1) Information provided by the applicant,

(2) The current domestic annual harvesting and processing capacity of the directed and incidental species for which a special permit is being requested,

(3) The current status of resources to be harvested in relation to the overfishing definition in the relevant FMP,

(4) Estimated ecosystem, habitat, and protected species impacts of the proposed activity, and

(5) Other biological and ecological information relevant to the proposal. The applicant will be provided with an opportunity to appear in support of the application.

(ii) Following a review of the Council's recommendation and supporting rationale, the Regional Administrator will:

(A) Concur with the Council's recommendation and, after finding that it is consistent with the goals and objectives of the FMP, the national standards, the Endangered Species Act, and other applicable laws, approve or deny a permit; or

(B) Reject the Council's recommendation, in which case, written reasons will be provided by the Regional Administrator to the Council for the rejection.

(iii) If the Regional Administrator does not receive a recommendation from the Council within 60 days of Council receipt of the permit application, the Regional Administrator can make a determination of approval or denial independently.

(iv) Within 30 working days after the consultation in paragraph (d)(3)(ii) of this section, or as soon as practicable thereafter, NMFS will notify the applicant in writing of the decision to grant or deny the special permit and, if denied, the reasons for the denial. Grounds for denial of a permit include the following:

(A) The applicant has failed to disclose material information required, or has made false statements as to any material fact, in connection with his or her application.

(B) According to the best scientific information available, the directed or incidental catch in the season or location specified under the permit would detrimentally affect any marine resources in a significant way, including, but not limited to issues related to, spawning grounds or seasons, protected species interactions, EFH, and habitat areas of particular concern (HAPC).

(C) Issuance of the permit would inequitably allocate fishing privileges among domestic fishermen or would have economic allocation as its sole purpose.

(D) The method or amount of harvest in the season and/or location stated on the permit application is considered inappropriate based on previous human or natural impacts in the given area.

(E) NMFS has determined that the maximum number of permits for a given area in a given season has been reached and allocating additional permits in the same area would be detrimental to the resource.

(F) The activity proposed under the permit would create a significant enforcement problem.

§ 660.14 Reporting and recordkeeping.

(a) *Fishing record forms.* The operator of any fishing vessel subject to the requirements of §§660.21, 660.41, 660.61, 660.81, or 660.602 must maintain on board the vessel an accurate and complete record of catch, effort and other data on report forms provided by the Regional Administrator. For the fisheries managed under §§660.21, 660.41, 660.61 and 660.81, the original logbook form for each day of the fishing trip must be submitted to the Regional Administrator within 72 hours of each landing of MUS. For the fisheries managed under §660.601, the original logbook form for each day of the fishing trip must be submitted to the Regional Administrator within 30 days of each landing of MUS. The operators of vessels engaged in non-commercial fishing for pelagic or bottomfish management unit species within 12 miles of the geographic center of Midway Atoll are exempted from this requirement as long as they report their daily catch (including discards), effort and any protected species interactions, by gear type on forms provided by the U.S. Fish and Wildlife Service. In all cases, all information specified on the forms must be recorded on the forms within 24 hours after completion of each fishing day. Each form must be signed and dated by the fishing vessel operator.

(b) *Transshipment logbooks.* Any person subject to the requirements of §660.21(c) or §660.602(a)(2) must maintain on board the vessel an accurate and complete NMFS transshipment logbook containing report forms provided by the Regional Administrator. All information specified on the forms must be recorded on the forms within 24 hours after the day of transshipment. Each form must be signed and dated by the receiving vessel operator. The original logbook for each day of transshipment activity must be submitted to the Regional Administrator within 72 hours of each landing of Pacific pelagic management unit species. The original logbook for each day of transshipment activity must be submitted to the Regional Administrator within 7 days of each landing of coral reef ecosystem MUS.

(c) *Sales report.* The operator of any fishing vessel subject to the requirements of §660.41 must submit to the Regional Administrator, within 72 hours of offloading of crustaceans management unit species, an accurate and complete sales report on a form provided by the Regional Administrator. The form must be signed and dated by the fishing vessel operator.

(d) *Packing or weigh-out slips.* The operator of any fishing vessel subject to the requirements of §660.41 must attach packing or weighout slips provided to the operator by the first-level buyer(s), unless the packing or weighout slips have not been provided in time by the buyer(s).

(e) *Modification of reporting and recordkeeping requirements.* The Regional Administrator may, after consultation with the Council, initiate rulemaking to modify the information to be provided on the fishing record forms, transshipment logbook, and sales report forms and timeliness by which the information is to be provided, including the submission of packing or weighout slips.

(f) *Availability of records for inspection*—(1) *Pacific pelagic management unit species.* Upon request, any fish dealer must immediately provide an authorized officer access for inspecting and copying all records of purchases, sales, or other transactions involving Pacific pelagic management unit species taken or handled by longline vessels that have permits issued under this subpart or that are otherwise subject to subpart C of this part, including, but not limited to, information concerning:

(i) The name of the vessel involved in each transaction and the owner or operator of the vessel.

(ii) The weight, number, and size of each species of fish involved in each transaction.

(iii) Prices paid by the buyer and proceeds to the seller in each transaction.

(2) *Crustaceans management unit species.* Upon request, any first-level buyer must immediately allow an authorized officer and any employee of NMFS designated by the Regional Administrator, to access, inspect, and copy all records relating to the harvest, sale, or transfer of crustacean management unit species taken by vessels that have permits issued under this subpart or that are otherwise subject to subpart D of this part. This requirement may be met by furnishing the information on a worksheet provided by the Regional Administrator. The information must include, but is not limited to:

(i) The name of the vessel involved in each transaction and the owner or operator of the vessel.

(ii) The amount, number, and size of each management unit species involved in each transaction.

(iii) Prices paid by the buyer and proceeds to the seller in each transaction.

(3) *Bottomfish and seamount groundfish management unit species.* Any person who is required by state laws and regulations to maintain records of landings and sales for vessels regulated by this subpart and subpart E of this part must make those records immediately available for Federal inspection and copying upon request by an authorized officer.

(4) *Coral reef ecosystem MUS.* Any person who has a special permit and who is required by state laws and regulations to maintain and submit records of catch and effort, landings and sales for coral reef ecosystem MUS by this subpart and subpart J of this part must make those records immediately available for Federal inspection and copying upon request by an authorized officer as defined in §600.10 of this chapter of this chapter

(g) *State reporting.* Any person who has a permit under §660.21, 660.61, or 660.601 and who is regulated by state laws and regulations to maintain and submit records of catch and effort, landings and sales for vessels regulated by subparts C, E and J of this part must maintain and submit those records in the exact manner required by state laws and regulations.

§ 660.15 Prohibitions.

In addition to the prohibitions in §600.725 of this chapter, it is unlawful for any person to:

(a) Engage in fishing without a valid permit or facsimile of a valid permit on board the vessel and available for inspection by an authorized officer, when a permit is required under §660.13 or §660.17, unless the vessel was at sea when the permit was issued under §660.13, in which case the permit must be on board the vessel before its next trip.

(b) File false information on any application for a fishing permit under §660.13 or an EFP under §660.17.

(c) Fail to file reports in the exact manner required by any state law or regulation, as required in §660.14.

(d) Falsify or fail to make, keep, maintain, or submit any logbook or logbook form or other record or report required under §§660.14 and 660.17.

(e) Refuse to make available to an authorized officer or a designee of the Regional Administrator for inspection or copying, any records that must be made available in accordance with §660.14.

(f) Fail to affix or maintain vessel or gear markings, as required by §§660.16, 660.24, 660.47, and 660.605.

(g) Violate a term or condition of an EFP issued under §660.17.

(h) Fail to report any take of or interaction with protected species as required by §660.17(k).

(i) Fish without an observer on board the vessel after the owner or agent of the owner has been directed by NMFS to make accommodations available for an observer under §§660.17, 660.28, 660.49, or 660.65.

(j) Refuse to make accommodations available for an observer when so directed by the Regional Administrator under §660.28, §660.49, or §660.65, or under any provision in an EFP issued under §660.17.

(k) Fail to notify officials as required in §§660.23, 660.28, 660.43, 660.63, and 660.603.

(l) Fish for, take or retain within a no-take MPA, defined in §660.18, any bottomfish management unit species, crustacean management unit species, Pacific pelagic management unit species, precious coral, seamount groundfish or coral reef ecosystem MUS.

§ 660.16   Vessel identification.

(a) Each fishing vessel subject to this subpart must display its official number on the port and starboard sides of the deckhouse or hull, and on an appropriate weather deck, so as to be visible from enforcement vessels and aircraft.

(b) The official number must be affixed to each vessel subject to this subpart and subparts C, D, E, and F of this part, in block Arabic numerals at least 18 inches (45.7 cm) in height for fishing and receiving vessels of 65 ft (19.8 m) LOA or longer, and at least 10 inches (25.4 cm) in height for all other vessels, except vessels subject to Subpart F and 65 ft (19.8 m) LOA or longer must be marked in block Arabic numerals at least 14 inches (35.6 cm) in height. Marking must be legible and of a color that contrasts with the background.

(c) The vessel operator must ensure that the official number is clearly legible and in good repair.

(d) The vessel operator must ensure that no part of the vessel, its rigging, or its fishing gear obstructs the view of the official number from an enforcement vessel or aircraft.

§ 660.17   Experimental fishing.

(a) *General.* The Regional Administrator may authorize, for limited purposes, the direct or incidental harvest of management unit species that would otherwise be prohibited by this subpart and subparts C, D, E, and F of this part. No experimental fishing may be conducted unless authorized by an EFP issued by the Regional Administrator in accordance with the criteria and procedures specified in this section. EFPs will be issued without charge.

(b) *Observers.* No experimental fishing for crustacean management unit species may be conducted unless an NMFS scientific observer is aboard the vessel.

(c) *Application.* An applicant for an EFP must submit to the Regional Administrator at least 60 days before the desired date of the EFP a written application including, but not limited to, the following information:

(1) The date of the application.

(2) The applicant's name, mailing address, and telephone number.

(3) A statement of the purposes and goals of the experiment for which an EFP is needed, including a general description of the arrangements for disposition of all species harvested under the EFP.

(4) A statement of whether the proposed experimental fishing has broader significance than the applicant's individual goals.

(5) For each vessel to be covered by the EFP:

(i) Vessel name.

(ii) Name, address, and telephone number of owner and operator.

(iii) USCG documentation, state license, or registration number.

(iv) Home port.

(v) Length of vessel.

(vi) Net tonnage.

(vii) Gross tonnage.

(6) A description of the species (directed and incidental) to be harvested under the EFP and the amount of such harvest necessary to conduct the experiment.

(7) For each vessel covered by the EFP, the approximate times and places fishing will take place, and the type, size, and amount of gear to be used.

(8) The signature of the applicant.

(d) *Incomplete applications.* The Regional Administrator may request from an applicant additional information necessary to make the determinations required under this section. An applicant will be notified of an incomplete application within 10 working days of receipt of the application. An incomplete application will not be considered until corrected in writing.

(e) *Issuance.* (1) If an application contains all of the required information, NMFS will publish a notice of receipt of the application in the Federal Register with a brief description of the proposal and will give interested persons an opportunity to comment. The Regional Administrator will also forward copies of the application to the Council, the USCG, and the fishery management agency of the affected state, accompanied by the following information:

(i) The current utilization of domestic annual harvesting and processing capacity (including existing experimental harvesting, if any) of the directed and incidental species for which an EFP is being requested.

(ii) A citation of the regulation or regulations that, without the EFP, would prohibit the proposed activity.

(iii) Biological information relevant to the proposal.

(2) At a Council meeting following receipt of a complete application, the Regional Administrator will consult with the Council and the Director of the affected state fishery management agency concerning the permit application. The applicant will be notified in advance of the meeting at which the application will be considered, and invited to appear in support of the application, if the applicant desires.

(3) Within 5 working days after the consultation in paragraph (e)(2) of this section, or as soon as practicable thereafter, NMFS will notify the applicant in writing of the decision to grant or deny the EFP and, if denied, the reasons for the denial. Grounds for denial of an EFP include, but are not limited to, the following:

(i) The applicant has failed to disclose material information required, or has made false statements as to any material fact, in connection with his or her application.

(ii) According to the best scientific information available, the harvest to be conducted under the permit would detrimentally affect any species of fish in a significant way.

(iii) Issuance of the EFP would inequitably allocate fishing privileges among domestic fishermen or would have economic allocation as its sole purpose.

(iv) Activities to be conducted under the EFP would be inconsistent with the intent of this section or the management objectives of the FMP.

(v) The applicant has failed to demonstrate a valid justification for the permit.

(vi) The activity proposed under the EFP would create a significant enforcement problem.

(4) The decision to grant or deny an EFP is final and unappealable. If the permit is granted, NMFS will publish a notice in the Federal Register describing the experimental fishing to be conducted under the EFP. The Regional Administrator may attach terms and conditions to the EFP consistent with the purpose of the experiment including, but not limited to:

(i) The maximum amount of each species that can be harvested and landed during the term of the EFP, including trip limits, where appropriate.

(ii) The number, sizes, names, and identification numbers of the vessels authorized to conduct fishing activities under the EFP.

(iii) The times and places where experimental fishing may be conducted.

(iv) The type, size, and amount of gear which may be used by each vessel operated under the EFP.

(v) The condition that observers be carried aboard vessels operating under an EFP.

(vi) Data reporting requirements.

(vii) Such other conditions as may be necessary to assure compliance with the purposes of the EFP consistent with the objectives of the FMP.

(f) *Duration.* Unless otherwise specified in the EFP or a superseding notice or regulation, an EFP is effective for no longer than 1 year, unless revoked, suspended, or modified. EFPs may be renewed following the application procedures in this section.

(g) *Alteration.* Any EFP that has been altered, erased, or mutilated is invalid.

(h) *Transfer.* EFPs issued under subparts B through F of this part are not transferable or assignable. An EFP is valid only for the vessel(s) for which it is issued.

(i) *Inspection.* Any EFP issued under subparts B through F of this part must be carried aboard the vessel(s) for which it was issued. The EFP must be presented for inspection upon request of any authorized officer.

(j) *Sanctions.* Failure of the holder of an EFP to comply with the terms and conditions of an EFP, the provisions of subparts A through F of this part, any other applicable provision of this part, the Magnuson Act, or any other regulation promulgated thereunder, is grounds for revocation, suspension, or modification of the EFP with respect to all persons and vessels conducting activities under the EFP. Any action taken to revoke, suspend, or modify an EFP will be governed by 15 CFR part 904 subpart D. Other sanctions available under the statute will be applicable.

(k) *Protected species.* Persons fishing under an EFP must report any incidental take or fisheries interaction with protected species on a form provided for that purpose. Reports must be submitted to the Regional Administrator within 3 days of arriving in port.

§ 660.18 Area restrictions.

(a) Fishing is prohibited in all no-take MPAs designated in this section.

(b) Anchoring by all fishing vessels over 50 ft (15.25 m) LOA is prohibited in the U.S. EEZ seaward of the Territory of Guam west of 144°30' E. long. except in the event of an emergency caused by ocean conditions or by a vessel malfunction that can be documented.

(c) *MPAs*—(1) *No-take MPAs.* The following U.S. EEZ waters are no-take MPAs:

(i) Landward of the 50-fathom (fm) (91.5-m) curve at Jarvis, Howland, and Baker Islands, and Kingman Reef; as depicted on National Ocean Survey Chart Numbers 83116 and 83153;

(ii) Landward of the 50-fm (91.5-m) curve around Rose Atoll, as depicted on National Ocean Survey Chart Number 83484.

(iii) Within the NWHI National Marine Sanctuary westward of X longitude.

(iv) Within a box around French Frigate Shoals bounded by straight lines connecting the following coordinates in the order listed:

Point	N. lat.	W. long.
A..................................	24°00[min]	167°40[min]
L..................................	24°25[min]	166°00[min]
M..................................	23°30[min]	167°40[min]
N..................................	23°30[min]	166°00[min]

(2) *Low-use MPAs.* The following U.S. EEZ waters in the Western Pacific Region are low-use MPAs:

(i) All waters between the shoreline and the 50-fm (91.5-m) curve around Johnston Atoll, Palmyra Atoll, and Wake Island as depicted on National Ocean Survey Chart Numbers 83637, 83157 and 81664.

(ii) [Reserved]

Subpart C—Western Pacific Pelagic Fisheries

§ 660.21 Permits.

(a) A vessel of the United States must be registered for use with a valid permit under the High Seas Fishing Compliance Act if that vessel is used to fish on the high seas, as required under §300.15 of this title.

(b) A vessel of the United States must be registered for use under a valid Hawaii longline limited access permit if that vessel is used:

(1) To fish for Pacific pelagic management unit species using longline gear in the EEZ around the Hawaiian Archipelago; or

(2) To land or transship, shoreward of the outer boundary of the EEZ around the Hawaiian Archipelago, Pacific pelagic management unit species that were harvested using longline gear.

(c) A vessel of the United States must be registered for use under a valid American Samoa longline limited access permit, in accordance with §660.36, if that vessel is used:

(1) To fish for Pacific pelagic management unit species using longline gear in the EEZ around American Samoa; or

(2) To land shoreward of the outer boundary of the EEZ around American Samoa Pacific pelagic management unit species that were harvested using longline gear in the EEZ around American Samoa; or

(3) To transship shoreward of the outer boundary of the EEZ around American Samoa Pacific pelagic management unit species that were harvested using longline gear in the EEZ around American Samoa or on the high seas.

(d) A vessel of the United States must be registered for use under a valid Western Pacific general longline permit, American Samoa longline limited access permit, or Hawaii longline limited access permit if that vessel is used:

(1) To fish for Pacific pelagic management unit species using longline gear in the EEZ around Guam, the Northern Mariana Islands, or the Pacific remote island areas (with the exception of Midway Atoll); or

(2) To land or transship shoreward of the outer boundary of the EEZ around Guam, the Northern Mariana Islands, or the Pacific remote island areas (with the exception of Midway Atoll), Pacific pelagic management unit species that were harvested using longline gear.

(e) A receiving vessel of the United States must be registered for use with a valid receiving vessel permit if that vessel is used to land or transship, within the Western Pacific Fishery Management Area, Pacific pelagic management unit species that were harvested using longline gear.

(f) A vessel of the United States must be registered for use with a valid PRIA pelagic troll and handline fishing permit if that vessel is used to fish for Pacific pelagic management unit species using pelagic handline or trolling fishing methods in the EEZ around the PRIA.

(g) A vessel of the United States must be registered for use with a valid Northwestern Hawaiian Islands National Marine Sanctuary commercial pelagic permit if that vessel is used to fish commercially for Pacific pelagic management unit species shoreward of the outer boundary of the NWHI National Marine Sanctuary.

(h) A vessel of the United States must be registered for use with a valid Northwestern Hawaiian Islands National Marine Sanctuary recreational permit if that vessel is used to fish non-commercially for Pacific pelagic management unit species shoreward of the outer boundary of the NWHI National Marine Sanctuary.

g) Any required permit must be valid and on board the vessel and available for inspection by an authorized agent, except that, if the permit was issued (or registered to the vessel) during the fishing trip in question, this requirement applies only after the start of any subsequent fishing trip.

(h) A permit is valid only for the vessel for which it is registered. A permit not registered for use with a particular vessel may not be used.

(i) An application for a permit required under this section will be submitted to PIRO as described in §660.13.

(j) General requirements governing application information, issuance, fees, expiration, replacement, transfer, alteration, display, and sanctions for permits issued under this section, as applicable, are contained in §660.13.

(k) A Hawaii longline limited access permit may be transferred as follows:

(1) The owner of a Hawaii longline limited access permit may apply to transfer the permit:

(i) To a different person for registration for use with the same or another vessel; or

(ii) For registration for use with another U.S. vessel under the same ownership.

(2) [Reserved]

(l) A Hawaii longline limited access permit will not be registered for use with a vessel that has a LOA greater than 101 ft (30.8 m).

(m) Only a person eligible to own a documented vessel under the terms of 46 U.S.C. 12102(a) may be issued or may hold (by ownership or otherwise) a Hawaii longline limited access permit.

(n) *Issuance of NWHI National Marine Sanctuary commercial pelagic permits.* The target number of NWHI Sanctuary commercial pelagic permits issued at any one time is X permits. If there are less than X permits issued, the Regional Administrator will issue new NWHI Sanctuary commercial pelagic permits under § 660.13 with eligibility based on the system described in this section.

(i) reserved pending final Council action.

(o) *Permit appeals.* Except as provided in subpart D of 15 CFR part 904, any applicant for a permit or any permit owner may appeal to the Regional Administrator the granting, denial, conditioning, suspension, or transfer of a permit or requested permit under this section. To be considered by the Regional Administrator, the appeal must be in writing, must state the action(s) appealed, and the reasons therefor, and must be submitted within 30 days of the action(s) by the Regional Administrator. The appellant may request an informal hearing on the appeal.

(1) Upon receipt of an appeal authorized by this section, the Regional Administrator may request additional information. Upon receipt of sufficient information, the Regional Administrator will decide the appeal in accordance with the criteria set out in this part for qualifying for, or renewing, limited access permits. In making such decision, the Administrator will review relevant portions of the Fishery Management Plan for the Pelagic Fisheries of the Western Pacific Region, to the extent such review would clarify the criteria in this part. Such decision will be based upon information relative to the application on file at NMFS and the Council and any additional information available; the summary record kept of any hearing and the hearing officer's recommended decision, if any, as provided in paragraph (n)(3) of this section; and such other considerations as deemed appropriate. The Regional Administrator will notify the appellant of the decision and the reasons therefor, in writing, normally within 30 days of the receipt of sufficient information, unless additional time is needed for a hearing.

(2) If a hearing is requested, or if the Regional Administrator determines that one is appropriate, the Regional Administrator may grant an informal hearing before a hearing officer designated for that purpose. Such a hearing normally shall be held no later than 30 days following receipt of the appeal, unless the hearing officer extends the time. The appellant and, at the discretion of the hearing officer, other interested persons, may appear personally or be represented by counsel at the hearing and submit information and present arguments as determined appropriate by the hearing officer. Within 30 days of the last day of the hearing, the hearing officer shall recommend, in writing, a decision to the Regional Administrator.

(3) The Regional Administrator may adopt the hearing officer's recommended decision, in whole or in part, or may reject or modify it. In any event, the Regional Administrator will notify the appellant, and interested persons, if any, of the decision, and the reason(s) therefor, in writing, within 30 days of receipt of the hearing officer's recommended decision. The Regional Administrator's action shall constitute final Agency action for purposes of the Administrative Procedure Act.

(4) In the case of a timely appeal from an American Samoa longline limited access permit initial permit decision, the Regional Administrator will issue the appellant a temporary American Samoa longline limited access permit. A temporary permit will expire 20 days after the Regional Administrator's final decision on the appeal. In no event will a temporary permit be effective for longer than 60 days.

(5) With the exception of temporary permits issued under paragraph (n)(4) of this section, any time limit prescribed in this section may be extended for a period not to exceed 30 days by the Regional Administrator for good cause, either upon his/her own motion or upon written request from the appellant stating the reason(s) therefor.

§ 660.22 Prohibitions.

In addition to the prohibitions specified in Part 600 §600.725 of this chapter, it is unlawful for any person to do any of the following:

(a) Falsify or fail to make and/or file all reports of Pacific pelagic management unit species landings, containing all data and in the exact manner, as required by applicable state law or regulation, as specified in §660.3, provided that the person is required to do so by applicable state law or regulation.

(b) Use a vessel without a valid permit issued under the High Seas Fishing Compliance Act to fish for Pacific pelagic management unit species using longline gear, on the high seas, in violation of §§300.15 and 660.21(a)of this title.

(c) Use a vessel in the EEZ around the Hawaiian Archipelago without a valid Hawaii longline limited access permit registered for use with that vessel, to fish for Pacific pelagic management unit species using longline gear, in violation of §660.21(b)(1).

(d) Use a vessel shoreward of the outer boundary of the EEZ around the Hawaiian Archipelago without a valid Hawaii longline limited access permit registered for use with that vessel, to land or transship Pacific pelagic management unit species that were harvested with longline gear, in violation of §660.21(b)(2).

(e) Use a vessel in the EEZ around American Samoa without a valid American Samoa longline limited access permit registered for use with that vessel, to fish for Pacific pelagic management unit species using longline gear, in violation of §660.21(c)(1).

(f) Use a vessel shoreward of the outer boundary of the EEZ around American Samoa without a valid American Samoa longline limited access permit registered for use with that vessel, to land Pacific pelagic management unit species that were caught with longline gear within the EEZ around American Samoa, in violation of §660.21(c)(2).

(g) Use a vessel within the EEZ around American Samoa without a valid American Samoa longline limited access permit registered for use with that vessel, to transship Pacific pelagic management unit species that were caught with longline gear, in violation of §660.21(c)(3).

(h) Use a vessel in the EEZ around Guam, the Northern Mariana Islands, or the Pacific remote island areas (with the exception of Midway Atoll) without either a valid Western Pacific general longline permit, American Samoa longline limited access permit or a Hawaii longline limited access permit registered for use with that vessel, to fish for Pacific pelagic management unit species using longline gear, in violation of §660.21(d)(1).

(i) Use a vessel shoreward of the outer boundary of the EEZ around Guam, the Northern Mariana Islands, or the Pacific remote island areas (with the exception of Midway Atoll) without either a valid Western Pacific general longline permit, American Samoa longline limited access permit or a Hawaii longline limited access permit registered for use with that vessel, to land or transship Pacific pelagic management unit species that were harvested using longline gear, in violation of §660.21(d)(2).

(j) Use a vessel in the Western Pacific Fishery Management Area to land or transship Pacific pelagic management unit species caught by other vessels using longline gear, without a valid receiving vessel permit registered for use with that vessel, in violation of §660.21(e).

(k) Use a vessel in the EEZ around the PRIA employing handline or trolling methods to fish for Pacific pelagic management unit species without a valid PRIA pelagic troll and handline fishing permit registered for use for that vessel, in violation of §660.21(f).

(l) Fish in the fishery after failing to comply with the notification requirements in §660.23.

(m) Fail to comply with notification requirements set forth in §660.23 or in any EFP issued under §660.17.

(n) Fail to comply with a term or condition governing the vessel monitoring system when using a vessel registered for use with a Hawaii longline limited access permit, or a vessel registered for use with a size Class C or D American Samoa longline limited access permit, in violation of §660.25.

(o) Fish for, catch, or harvest Pacific pelagic management unit species with longline gear without a VMS unit on board the vessel after installation of the VMS unit by NMFS, in violation of §660.25(d)(2).

(p) Possess on board a vessel without a VMS unit Pacific pelagic management unit species harvested with longline gear after NMFS has installed the VMS unit on the vessel, in violation of §660.25(d)(2).

(q) Interfere with, tamper with, alter, damage, disable, or impede the operation of a VMS unit or to attempt any of the same; or to move or remove a VMS unit without the prior permission of the SAC in violation of §660.25(d)(3).

(r) Make a false statement, oral or written, to an authorized officer, regarding the use, operation, or maintenance of a VMS unit, in violation of §660.25(d)(1).

(s) Interfere with, impede, delay, or prevent the installation, maintenance, repair, inspection, or removal of a VMS unit, in violation of §660.25(d)(1).

(t) Interfere with, impede, delay, or prevent access to a VMS unit by a NMFS observer, in violation of §660.28(f)(4).

(u) Connect or leave connected additional equipment to a VMS unit without the prior approval of the SAC, in violation of §660.25(e).

(v) Fish with longline gear within a longline fishing prohibited area, except as allowed pursuant to an exemption issued under §660.17 or §660.27, in violation of §660.26.

(w) Fish for Pacific pelagic management unit species with longline gear within the protected species zone, in violation of §660.26(b).

(x) Fail to comply with a term or condition governing the observer program established in §660.28 if using a vessel registered for use with a Hawaii longline limited access permit, or a vessel registered for use with a size Class B, C or D American Samoa longline limited access permit, to fish for Pacific pelagic management unit species using longline gear.

(y) Fail to comply with other terms and conditions that the Regional Administrator imposes by written notice to either the permit holder or the designated agent of the permit holder to facilitate the details of observer placement.

(z) Fail to fish in accordance with the seabird take mitigation techniques set forth at §660.35(a)(1) or §660.35(a)(2) when operating a vessel registered for use under a Hawaii longline limited access permit in violation of §660.35(a).

(aa) When operating a vessel registered for use under a American Samoa longline limited access permit or a Hawaii longline limited access permit, fail to comply with the sea turtle handling, resuscitation, and release requirements, in violation of §660.32(b).

(bb) Engage in shallow-setting without a valid shallow-set certificate for each shallow set made, in violation of §660.33(c).

(cc) Own or operate a vessel registered for use under any longline permit issued under §660.21 while engaged in longline fishing for Pelagic Management Unit Species and fail to be certified for completion of a NMFS protected species workshop, in violation of §660.34(a).

(dd) Own or operate a vessel registered for use under any longline permit issued under §660.21 while engaged in longline fishing for Pelagic Management Unit Species without having on board a valid protected species workshop certificate issued by NMFS or a legible copy thereof, in violation of §660.34(d).

(ee) Possess light sticks on board a vessel registered for use under a Hawaii longline limited access permit at any time during a trip for which notification to NMFS under §660.23(a) indicated that deep-setting would be done, in violation of §660.33(d).

(ff) Fail to carry, or fail to use, a line clipper, dip net, or dehooker on a vessel registered for use under any longline permit issued under §660.21, in violation of §660.32.

(gg) Engage in shallow-setting from a vessel registered for use under a Hawaii longline limited access permit north of the equator (0° lat.) with hooks other than offset circle hooks sized 18/0 or larger, with 10° offset, in violation of §660.33(f).

(hh) Engage in shallow-setting from a vessel registered for use under a Hawaii longline limited access permit north of the equator (0° lat.) with bait other than mackerel-type bait, in violation of §660.33(g).

(ii) When operating a vessel registered for use under any longline permit issued under §660.21 or operating a vessel using hooks to target Pelagic Management Unit Species while fishing under the Pelagics FMP, fail to comply with the sea turtle handling requirements, in violation of §660.32(b).

(jj) Engage in shallow-setting from a vessel registered for use under any longline permit issued under §660.21 north of the Equator (0° lat.) with hooks other than offset circle hooks sized 18/0 or larger, with a 10° offset, in violation of §660.33(f).

(kk) Engage in shallow-setting from a vessel registered for use under any longline permit issued under §660.21 north of the Equator (0° lat.) with bait other than mackerel-type bait, in violation of §660.33(g).

(ll) Operate a vessel registered for use under a Hawaii longline limited access permit while engaged in longline fishing without having on board a valid protected species workshop certificate issued by NMFS or a legible copy thereof, in violation of §660.34(d).

(mm) Fail to use a line setting machine or line shooter, with weighted branch lines, to set the main longline when operating a vessel that is registered for use under a Hawaii longline limited access permit and equipped with monofilament main longline, when making deep sets north of 23° N. lat., in violation of §660.35(a)(1) or (a)(2).

(nn) Fail to employ basket-style longline gear such that the mainline is deployed slack when operating a vessel registered for use under a Hawaii longline limited access north of 23° N. lat., in violation of §660.35(a)(3).

(oo) Fail to maintain and use blue dye to prepare thawed bait when operating a vessel registered for use under a Hawaii longline limited access permit that is fishing north of 23° N. lat., in violation of §660.35(a)(4), (a)(5), or (a)(6).

(pp) Fail to retain, handle, and discharge fish, fish parts, and spent bait, strategically when operating a vessel registered for use under a Hawaii longline limited access permit that is fishing north of 23° N. lat., in violation of §660.35(a)(7), through (a)(9).

(qq) Fail to be begin the deployment of longline gear at least 1 hour after local sunset or fail to complete the setting process before local sunrise from a vessel registered for use under a Hawaii longline limited access permit while shallow-setting north of 23° N. lat., in violation of §660.35(a)(1).

(rr) Fail to handle short-tailed albatrosses that are caught by pelagic longline gear in a manner that maximizes the probability of their long-term survival, in violation of §660.35 (b).

(ss)–(vv) [Reserved]

(ww) Fail to handle seabirds other than short-tailed albatrosses that are caught by pelagic longline gear in a manner that maximizes the probability of their long-term survival, in violation of §660.35(c).

(xx) Use a large vessel to fish for Pelagic management unit species within an American Samoa large vessel prohibited area except as allowed pursuant to an exemption issued under §660.38.

(yy) Fish for Pacific pelagic management unit species using gear prohibited under §660.30 or not permitted by an EFP issued under §660.17.

(zz) Use a vessel to fish commercially for Pacific pelagic management unit species shoreward of the outer boundary of the NWHI National Marine Sanctuary without a valid NWHI commercial pelagic permit registered for use with that vessel in violation of § 660.21(e).

§ 660.23 Notifications.

(a) The permit holder for any vessel registered for use under a Hawaii longline limited access permit or for any vessel greater than 40 ft (12.2 m) in length overall that is registered for use under an American Samoa longline limited access permit, or a designated agent, shall provide a notice to the Regional Administrator at least 72 hours (not including weekends and Federal holidays) before the vessel leaves port on a fishing trip, any part of which occurs in the EEZ around the Hawaiian Archipelago or American Samoa. For the purposes of this section, the vessel operator will be presumed to be an agent designated by the permit holder unless the Regional Administrator is otherwise notified by the permit holder. The notice must be provided to the office or telephone number designated by the Regional Administrator. The notice must provide the official number of the vessel, the name of the vessel, the intended departure date, time, and location, the name of the operator of the vessel, and the name and telephone number of the agent designated by the permit holder to be available between 8 a.m. and 5 p.m. (local time) on weekdays for NMFS to contact to arrange observer placement. Permit holders for vessels registered for use under Hawaii longline limited access permits must also provide notification of the trip type (either deep-setting or shallow-setting).

(b) The operator of any vessel subject to the requirements of this subpart who does not have on board a VMS unit while transiting the protected species zone as defined in §660.12, must notify the NMFS Special-Agent-In-Charge immediately upon entering and immediately upon departing the protected species zone. The notification must include the name of the vessel, name of the operator, date and time (GMT) of access or exit from the protected species zone, and location by latitude and longitude to the nearest minute.

(c) The permit holder for any American Samoa longline limited access permit, or an agent designated by the permit holder, must notify the Regional Administrator in writing within 30 days of any change to the permit holder's contact information or any change to the vessel documentation associated with a permit registered to an American Samoa longline limited access permit. Complete changes in the ownership of the vessel registered to an American Samoa longline limited access permit must also be reported to PIRO in writing within 30 days of the change. Failure to report such changes may result in a delay in processing an application, permit holders failing to receive important notifications, or sanctions pursuant to the Magnuson-Stevens Act at 16 U.S.C. §1858(g) or 15 CFR part 904, subpart D.

§ 660.24 Gear identification.

(a) *Identification.* The operator of each permitted vessel in the fishery management area must ensure that the official number of the vessel be affixed to every longline buoy and float, including each buoy and float that is attached to a radar reflector, radio antenna, or flag marker, whether attached to a deployed longline or possessed on board the vessel. Markings must be legible and permanent, and must be of a color that contrasts with the background material.

(b) *Enforcement action.* Longline gear not marked in compliance with paragraph (a) of this section and found deployed in the EEZ will be considered unclaimed or abandoned property, and may be disposed of in any manner considered appropriate by NMFS or an authorized officer.

§ 660.25 Vessel monitoring system.

(a) *VMS unit.* Only a VMS unit owned by NMFS and installed by NMFS complies with the requirement of this subpart.

(b) *Notification.* After a Hawaii longline limited access permit holder or size Class C or D American Samoa longline limited access permit holder has been notified by the SAC of a specific date for installation of a VMS unit on the permit holder's vessel, the vessel must carry the VMS unit after the date scheduled for installation.

(c) *Fees and charges.* During the experimental VMS program, a Hawaii longline limited access permit holder or size Class C or D American Samoa longline permit holder with a size Class D or D permit shall not be assessed any fee or other charges to obtain and use a VMS unit, including the communication charges related directed to requirements under this section. Communication charges related to any additional equipment attached to the VMS unit by the owner or operator shall be the responsibility of the owner or operator and not NMFS.

(d) *Permit holder duties.* The holder of a Hawaii longline limited access permit or a size Class C or D American Samoa longline permit and master of the vessel must:

(1) Provide opportunity for the SAC to install and make operational a VMS unit after notification.

(2) Carry the VMS unit on board whenever the vessel is at sea.

(3) Not remove or relocate the VMS unit without prior approval from the SAC.

(e) *Authorization by the SAC.* The SAC has authority over the installation and operation of the VMS unit. The SAC may authorize the connection or order the disconnection of additional equipment, including a computer, to any VMS unit when deemed appropriate by the SAC.

§ 660.26 Longline fishing prohibited area management.

(a) *Prohibited areas.* Longline fishing shall be prohibited in the longline fishing prohibited areas as defined in paragraphs (b), (c), and (d) of this section.

(b) *Longline protected species zone.* The protected species zone is 50 nm from the center geographical positions of Nihoa Island, Necker Island, French Frigate Shoals, Gardner Pinnacles, Maro Reef, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Midway Islands, and Kure Island, as defined in §660.12.

(c) *Main Hawaiian Islands.* (1) From February 1 through September 30 each year, the longline fishing prohibited area around the main Hawaiian Islands is the portion of the EEZ seaward of Hawaii bounded by straight lines connecting the following coordinates in the order listed:

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                Point                     N. lat.          DW. long.
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A..................................	18°05[min]	155°40[min]
B..................................	18°20[min]	156°25[min]
C..................................	20°00[min]	157°30[min]
D..................................	20°40[min]	161°40[min]
E..................................	21°40[min]	161°55[min]
F..................................	23°00[min]	161°30[min]
G..................................	23°05[min]	159°30[min]
H..................................	22°55[min]	157°30[min]
I..................................	21°30[min]	155°30[min]
J..................................	19°50[min]	153°50[min]
K..................................	19°00[min]	154°05[min]
A..................................	18°05[min]	155°40[min]

(2) From October 1 through the following January 31 each year, the longline fishing prohibited area around the main Hawaiian Islands is the portion of the EEZ seaward of Hawaii bounded by straight lines connecting the following coordinates in the order listed:

Point	N. lat.	W. long.
A..................................	18°05[min]	155°40[min]
L..................................	18°25[min]	155°40[min]
M..................................	19°00[min]	154°45[min]
N..................................	19°15[min]	154°25[min]
O..................................	19°40[min]	154°20[min]
P..................................	20°20[min]	154°55[min]
Q..................................	20°35[min]	155°30[min]
R..................................	21°00[min]	155°35[min]
S..................................	22°30[min]	157°35[min]
T..................................	22°40[min]	159°35[min]
U..................................	22°25[min]	160°20[min]
V..................................	21°55[min]	160°55[min]
W..................................	21°40[min]	161°00[min]
E..................................	21°40[min]	161°55[min]
D..................................	20°40[min]	161°40[min]
C..................................	20°00[min]	157°30[min]
B..................................	18°20[min]	156°25[min]
A..................................	18°05[min]	155°40[min]

(d) *Guam.* The longline fishing prohibited area around Guam is the waters seaward of Guam bounded by straight lines connecting the following coordinates in the order listed:

Point	N. lat.	E. long.
A..................................	14°25[min]	144°00[min]
B..................................	14°00[min]	143°38[min]
C..................................	13°41[min]	144°33[min]30[sec]
D..................................	13°00[min]	143°25[min]3

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                                                  0[sec]
E..................................  12°20[min]    143°37[min]
F..................................  11°40[min]    144°09[min]
G..................................  12°00[min]    145°00[min]
H..................................  13°00[min]    145°42[min]
I..................................  13°27[min]    145°51[min]
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§ 660.27 Exemptions for longline fishing prohibited areas; procedures.

(a) An exemption permitting a person to use longline gear to fish in a portion(s) of the Hawaii longline fishing prohibited area will be issued to a person who can document that he or she:

(1) Currently owns a Hawaii longline limited access permit issued under this part and registered for use with his or her vessel.

(2) Before 1970, was the owner or operator of a vessel when that vessel landed Pacific pelagic management unit species taken on longline gear in an area that is now within the Hawaii longline fishing prohibited area.

(3) Was the owner or operator of a vessel that landed Pacific pelagic management unit species taken on longline gear in an area that is now within the Hawaii longline fishing prohibited area, in at least 5 calendar years after 1969, which need not be consecutive.

(4) In any one of the 5 calendar years, was the owner or operator of a vessel that harvested at least 80 percent of its total landings, by weight, of longline-caught Pacific pelagic management unit species in an area that is now in the Hawaii longline fishing prohibited area.

(b) Each exemption shall specify the portion(s) of the Hawaii longline fishing prohibited area, bounded by longitudinal and latitudinal lines drawn to include each statistical area, as appearing on Hawaii State Commercial Fisheries Charts, in which the exemption holder made the harvest documented for the exemption application under paragraph (a)(4) of this section.

(c) Each exemption is valid only within the portion(s) of the Hawaii longline fishing prohibited area specified on the exemption.

(d) A person seeking an exemption under this section must submit an application and supporting documentation to the PIRO at least 15 days before the desired effective date of the exemption.

(e) If the Regional Administrator determines that a gear conflict has occurred and is likely to occur again in the Hawaii longline fishing prohibited area between a vessel used by a person holding an exemption under this section and a non-longline vessel, the Regional Administrator may prohibit all longline fishing in the Hawaii longline fishing prohibited area around the island where the conflict occurred, or in portions thereof, upon notice to each holder of an exemption who would be affected by such a prohibition.

(f) The Council will consider information provided by persons with Hawaii longline limited access permits issued under this part who believe they have experienced extreme financial hardship resulting from the Hawaii longline area closure, and will consider recommendations of the Pelagic Advisory Review Board to assess whether exemptions under this section should continue to be allowed, and, if appropriate, revise the qualifying criteria in paragraph (a) of this section to permit additional exemptions.

(1) If additional exemptions are needed, the Council will advise the Regional Administrator in writing of its recommendation, including criteria by which financial hardships will be mitigated, while retaining the effectiveness of the longline fishing prohibited area.

(2) Following a review of the Council's recommendation and supporting rationale, the Regional Administrator may:

(i) Reject the Council's recommendation, in which case written reasons will be provided by the Regional Administrator to the Council for the rejection; or

(ii) Concur with the Council's recommendation and, after finding that it is consistent with the goals and objectives of the Pelagics FMP, the national standards, and other applicable law, initiate rulemaking to implement the Council's recommendations.

§ 660.28 Conditions for at-sea observer coverage.

(a) NMFS shall advise the permit holder or the designated agent of any observer requirement at least 24 hours (not including weekends and Federal holidays) before any trip for which NMFS received timely notice in compliance with these regulations.

(b) The "Notice Prior to Fishing Trip" requirements in this subpart commit the permit holder to the representations in the notice. The notice can be modified by the permit holder or designated agent because of changed circumstance, if the Regional Administrator is promptly provided a modification to the notice that complies with the notice requirements. The notice will also be considered modified if the Regional Administrator and the permit holder or designated agent agree to placement changes.

(c) When NMFS notifies the permit holder or designated agent of the obligation to carry an observer in response to a notification under this subpart, or as a condition of an EFP issued under §660.17, the vessel may not engage in the fishery without taking the observer.

(d) A NMFS observer shall arrive at the observer's assigned vessel 30 minutes before the time designated for departure in the notice or the notice as modified, and will wait 1 hour for departure.

(e) A permit holder must accommodate a NMFS observer assigned under these regulations. The Regional Administrator's office, and not the observer, will address any concerns raised over accommodations.

(f) The permit holder, vessel operator, and crew must cooperate with the observer in the performance of the observer's duties, including:

(1) Allowing for the embarking and debarking of the observer.

(2) Allowing the observer access to all areas of the vessel necessary to conduct observer duties.

(3) Allowing the observer access to communications equipment and navigation equipment as necessary to perform observer duties.

(4) Allowing the observer access to VMS units to verify operation, obtain data, and use the communication capabilities of the units for official purposes.

(5) Providing accurate vessel locations by latitude and longitude or loran coordinates, upon request by the observer.

(6) Providing sea turtle, marine mammal, or sea bird specimens as requested.

(7) Notifying the observer in a timely fashion when commercial fishing operations are to begin and end.

(g) The permit holder, operator, and crew must comply with other terms and conditions to ensure the effective deployment and use of observers that the Regional Administrator imposes by written notice.

(h) The permit holder must ensure that assigned observers are provided living quarters comparable to crew members and are provided the same meals, snacks, and amenities as are normally provided to other vessel personnel. A mattress or futon on the floor or a cot is not acceptable if a regular bunk is provided to any crew member, unless other arrangements are approved in advance by the Regional Administrator.

(i) Reimbursement requirements are as follows:

(1) Upon observer verification of vessel accommodations and the number of assigned days on board, NMFS will reimburse vessel owners a reasonable amount for observer subsistence as determined by the Regional Administrator.

(2) If requested and properly documented, NMFS will reimburse the vessel owner for the following:

(i) Communications charges incurred by the observer.

(ii) Lost fishing time arising from a seriously injured or seriously ill observer, provided that notification of the nature of the emergency is transmitted to the Observer Program, NMFS (see address for PIRO Regional Administrator) at the earliest practical time. NMFS will reimburse the owner only for those days during which the vessel is unable to fish as a direct result of helping the NMFS employee who is seriously injured or seriously ill. Lost fishing time is based on time travelling to and from the fishing grounds and any documented out-of-pocket expenses for medical services. Payment will be based on the current target fish market prices and that vessel's average target fish catch retained per day at sea for the previous 2 years, but shall not exceed $5,000 per day or $20,000 per claim. Detailed billing with receipts and supporting records are required for allowable communication and lost fishing time claims. The claim must be completed in ink, showing the claimant's printed name, address, vessel name, observer name, trip dates, days observer on board, an explanation of the charges, and claimant's dated signature with a statement verifying the claim to be true and correct. Requested reimbursement claims must be submitted to the Fisheries Observer Branch, Southwest Region, NMFS. NMFS will not process reimbursement invoices and documentation submitted more than 120 days after the occurrence.

(j) If a vessel normally has cabins for crew members, female observers on a vessel with an all-male crew must be accommodated either in a single person cabin or, if NMFS concludes that adequate privacy can be ensured by installing a curtain or other temporary divider, in a two-person shared cabin. If the vessel normally does not have cabins for crew members, alternative accommodations must be approved by NMFS. If a cabin assigned to a female observer does not have its own toilet and shower facilities that can be provided for the exclusive use of the observer, or if no cabin is assigned, then arrangements for sharing common facilities must be established and approved in advance by NMFS.

§ 660.29 Port privileges and transiting for unpermitted U.S. longline vessels.

A U.S. longline fishing vessel that does not have a permit under subpart B of this part may enter waters of the fishery management area with Pacific pelagic management unit species on board, but may not land or transship any management unit species on board the vessel. The vessel's longline gear must be stowed or secured so it is rendered unusable during the time the vessel is in those waters.

§ 660.30 Prohibition of drift gillnetting.

Fishing with drift gillnets in the fishery management area is prohibited, except where authorized by an EFP issued under §660.17.

§ 660.31 Framework adjustments to management measures.

(a) *Introduction.* Adjustments in management measures may be made through rulemaking if new information demonstrates that there are biological, social, or economic concerns in the fishery.

The following framework process authorizes the implementation of measures that may affect the operation of the fisheries, gear, harvest guidelines, or changes in catch and/or effort.

(b) *Annual report.* By June 30 of each year, the Council-appointed Pelagics Plan Team will prepare an annual report on the fisheries in the management area. The report shall contain, among other things, recommendations for Council action and an assessment of the urgency and effects of such action(s).

(c) *Procedure for established measures.* (1) Established measures are management measures that, at some time, have been included in regulations implementing the FMP, and for which the impacts have been evaluated in Council/NMFS documents in the context of current conditions.

(2) Following the framework procedures of Amendment 7 to the Pelagics FMP, the Council may recommend to the Regional Administrator that established measures be modified, removed, or re-instituted. Such recommendation shall include supporting rationale and analysis, and shall be made after advance public notice, public discussion, and consideration of public comment. NMFS may implement the Council's recommendation by rulemaking if approved by the Regional Administrator.

(d) *Procedure for new measures.* (1) New measures are management measures that have not been included in regulations implementing the FMP, or for which the impacts have not been evaluated in Council/NMFS documents in the context of current conditions.

(2) Following the framework procedures of Amendment 7 to the Pelagics FMP, the Council will publicize, including by Federal Register notice, and solicit public comment on, any proposed new management measure. After a Council meeting at which the measure is discussed, the Council will consider recommendations and prepare a Federal Register notice summarizing the Council's deliberations, rationale, and analysis for the preferred action, and the time and place for any subsequent Council meeting(s) to consider the new measure. At subsequent public meeting(s), the Council will consider public comments and other information received to make a recommendation to the Regional Administrator about any new measure. NMFS may implement the Council's recommendation by rulemaking if approved by the Regional Administrator.

§ 660.32 Sea turtle take mitigation measures.

(a) *Possession and use of required mitigation gear.* The gear required in paragraph (a) of this section must be used according to the sea turtle handling requirements set forth in paragraph (b) of this section.

(1) *Hawaii longline limited access permits.* Any owner or operator of a vessel registered for use under a Hawaii longline limited access permit must carry aboard the vessel line clippers meeting the minimum design standards specified in paragraph (a)(5) of this section, dip nets meeting the minimum design standards specified in paragraph (a)(6) of this section, and dehookers meeting the minimum design and performance standards specified in paragraph (a)(4) of this section.

(2) *Other longline vessels with freeboards of more than 3 ft (0.91m).* Any owner or operator of a longline vessel with a permit issued under §660.21 other than a Hawaii limited access longline permit and that has a freeboard of more than 3 ft (0.91 m) must carry aboard the vessel line clippers meeting the minimum design standards specified in paragraph (a)(5) of this section, dip nets meeting the minimum design standards specified in paragraph (a)(6) of this section, and dehookers meeting ths minimum design and performance standards specified in paragraph (a)(7) of this section.

(3) *Other longline vessels with freeboards of 3 ft (0.91 m) or less.* Any owner or operator of a longline vessel with a permit issued under §660.21 other than a Hawaii limited access longline permit and that has a freeboard of 3 ft (0.91 m) or less must carry aboard their vessels line clippers capable of cutting the vessels fishing line or leader within approximately 1 ft (0.3 m) of the eye of an embedded hook, as well as wire or bolt cutters capable of cutting through the vessel's hooks.

(4) *Handline, troll, pole-and-line, and other vessels using hooks other than longline vessels.* Any owner or operator of a vessel fishing under the Pelagics FMP with hooks other than longline gear are not required to carry specific mitigation gear, but must comply with the handling requirements set forth in paragraph (b) of this section.

(5) *Dip nets.* Dip nets are intended to facilitate safe handling of sea turtles and access to sea turtles for purposes of cutting lines in a manner that minimizes injury and trauma to sea turtles. The minimum design standards for dip nets that meet the requirements of this section nets are:

(i) *An extended reach handle.* The dip net must have an extended reach handle of at least 6 ft (1.82 m) of wood or other rigid material able to support a minimum of 100 lbs (34.1 kg) without breaking or significant bending or distortion.

(ii) *Size of dip net.* The dip net must have a net hoop of at least 31 inches (78.74 cm) inside diameter and a bag depth of at least 38 inches (96.52 cm). The bag mesh openings may be no more than 3 inches × 3 inches (7.62 cm 7.62 cm).

(6) *Dehookers*—(i) *Long-handled dehooker for ingested hooks.* This item is intended to be used to remove ingested hooks from sea turtles that cannot be boated, and to engage a loose hook when a turtle is entangled but not hooked and line is being removed. One long-handled dehooker for ingested hooks is required on board. The minimum design and performance standards are as follows:

(A) *Hook removal device.* The hook removal device must be constructed of 5/16–inch (7.94 mm) 316 L stainless steel and have a dehooking end no larger than 1 7/8 inches (4.76 cm) outside diameter. The device must be capable of securely engaging and controlling the leader while shielding the barb of the hook to prevent the hook from re-engaging during removal. It must not have any unprotected terminal points (including blunt ones), as these could cause injury to the esophagus during hook removal. The device must be of a size capable of securing the range of hook sizes and styles used by the vessel.

(B) *Extended reach handle.* The hook removal device must be securely fastened to an extended reach handle or pole with a length equal to or greater than 150 percent of the vessel's freeboard or 6 ft (1.83 m), whichever is greater. It is recommended that the handle be designed so that it breaks down into sections. The handle must be sturdy and strong enough to facilitate the secure attachment of the hook removal device.

(ii) *Long-handled dehooker for external hooks.* This item is intended to be used to remove externally-hooked hooks from sea turtles that cannot be boated. The long-handled dehooker for ingested hooks described in paragraph (a)(4)(i) of this section meets this requirement. The minimum design and performance standards are as follows:

(A) *Construction.* The device must be constructed of 5/16–inch (7.94 mm) 316 L stainless steel rod. A 5–inch (12.70–cm) tube T-handle of 1–inch (2.54–cm) outside diameter is recommended, but not required. The dehooking end must be blunt with all edges rounded. The device must be of a size capable of securing the range of hook sizes and styles used by the vessel.

(B) *Handle.* The handle must have a length equal to or greater than the vessel's freeboard or 3 ft (0.91 m), whichever is greater.

(iii) *Long-handled device to pull an "inverted V".* This item is intended to be used to pull an "inverted V" in the fishing line when disentangling and dehooking entangled sea turtles. One long-handled device to pull an "inverted V" is required on board. The long-handled dehooker for external hooks described in paragraph (a)(4)(ii) of this section meets this requirement. The minimum design and performance standards are as follows:

(A) *Hook end.* It must have a hook-shaped end, like that of a standard boat hook or gaff, which must be constructed of stainless steel or aluminum.

(B) *Handle.* The handle must have a length equal to or greater than 150 percent of the vessel's freeboard or 6 ft (1.83 m), whichever is greater. The handle must be sturdy and strong enough to allow the hook end to be effectively used to engage and pull an "inverted V" in the line.

(iv) *Tire.* This item is intended to be used for supporting a turtle in an upright orientation while it is on board. One tire is required on board, but an assortment of sizes is recommended to accommodate a range of turtle sizes. The tire must be a standard passenger vehicle tire and must be free of exposed steel belts.

(v) *Short-handled dehooker for ingested hooks.* This item is intended to be used to remove ingested hooks, externally hooked hooks, and hooks in the front of the mouth of sea turtles that can be boated. One short-handled dehooker for ingested hooks is required on board. The minimum design and performance standards are as follows:

(A) *Hook removal device.* The hook removal device must be constructed of 1/4–inch (6.35–mm) 316 L stainless steel, and the design of the dehooking end must be such to allow the hook to be secured and the barb shielded without re-engaging during the hook removal process. The dehooking end must be no larger than 1 5/16 inch (3.33 cm) outside diameter. It must not have any unprotected terminal points (including blunt ones), as this could cause injury to the esophagus during hook removal. The dehooking end must be of a size appropriate to secure the range of hook sizes and styles used by the vessel.

(B) *Sliding plastic bite block.* The dehooker must have a sliding plastic bite block, which is intended to be used to protect the sea turtle's beak and facilitate hook removal if the turtle bites down on the dehooker. The bite block must be constructed of a 3/4–inch (1.91–cm) inside diameter high impact plastic cylinder (for example, Schedule 80 PVC) that is 10 inches (25.40 cm) long. The dehooker and bite block must be configured to allow for 5 inches (12.70 cm) of slide of the bite block along the shaft of the dehooker.

(C) *Shaft and handle.* The shaft must be 16 to 24 inches (40.64 - 60.69 cm) in length, and must have a T-handle 4 to 6 inches (10.16 - 15.24 cm) in length and 3/4 to 1 1/4 inches (1.90 - 3.18 cm) in diameter.

(vi) *Short-handled dehooker for external hooks.* This item is intended to be used to remove externally hooked hooks from sea turtles that can be boated. One short-handled dehooker for external hooks is required on board. The short-handled dehooker for ingested hooks required to comply with paragraph (a)(4)(v) of this section meets this requirement. The minimum design and performance standards are as follows:

(A) *Hook removal device.* The hook removal device must be constructed of 5/16–inch (7.94–cm) 316 L stainless steel, and the design must be such that a hook can be rotated out without pulling it out at an angle. The dehooking end must be blunt, and all edges rounded. The device must be of a size appropriate to secure the range of hook sizes and styles used by the vessel.

(B) *Shaft and handle*. The shaft must be 16 to 24 inches (40.64 - 60.69 cm) in length, and must have a T-handle 4 to 6 inches (10.16 - 15.24 cm) in length and 3/4 to 1 1/4 inches (1.90 - 3.18 cm) in diameter.

(vii) *Long-nose or needle-nose pliers.* This item is intended to be used to remove deeply embedded hooks from the turtle's flesh that must be twisted in order to be removed, and also to hold in place PVC splice couplings when used as mouth openers. One pair of long-nose or needle-nose pliers is required on board. The minimum design standards are as follows: The pliers must be 8 to 14 inches (20.32 - 35.56 cm) in length. It is recommended that they be constructed of stainless steel material.

(viii) *Wire or bolt cutters.* This item is intended to be used to cut through hooks in order to remove all or part of the hook. One pair of wire or bolt cutters is required on board. The minimum design and performance standards are as follows: The wire or bolt cutters must be capable of cutting hard metals, such as stainless or carbon steel hooks, and they must be capable of cutting through the hooks used by the vessel.

(ix) *Monofilament line cutters.* This item is intended to be used to cut and remove fishing line as close to the eye of the hook as possible if the hook is swallowed or cannot be removed. One pair of monofilament line cutters is required on board. The minimum design standards are as follows: Monofilament line cutters must be 6 to 9 inches (15.24 - 22.86 cm) in length. The blades must be 1 3/4 (4.45 cm) in length and 5/8 inches (1.59 cm) wide when closed.

(x) *Mouth openers and gags.* These items are intended to be used to open the mouths of boated sea turtles, and to keep them open when removing ingested hooks in a way that allows the hook or line to be removed without causing further injury to the turtle. At least two of the seven different types of mouth openers and gags described below are required on board. The seven types and their minimum design standards are as follows.

(A) *A block of hard wood.* A block of hard wood is intended to be used to gag open a turtle's mouth by placing it in the corner of the jaw. It must be made of hard wood of a type that does not splinter (for example, maple), and it must have rounded and smoothed edges. The dimensions must be 10 to 12 inches (24.50 - 30.48 cm) by 3/4 to 1 1/4 inches (1.90 - 3.18 cm) by 3/4 to 1 1/4 inches (1.90 - 3.18 cm).

(B) *A set of three canine mouth gags.* A canine mouth gag is intended to be used to gag open a turtle's mouth while allowing hands-free operation after it is in place. A set of canine mouth gags must include one of each of the following sizes: small (5 inches) (12.7 cm), medium (6 inches) (15.2 cm), and large (7 inches) (17.8 cm). They must be constructed of stainless steel. A 1 3/4–inch (4.45 cm) long piece of vinyl tubing (3/4 inch (1.91 cm) outside diameter and 5/8 inch (1.59 cm) inside diameter) must be placed over the ends of the gags to protect the turtle's beak.

(C) *A set of two sturdy canine chew bones.* A canine chew bone is intended to be used to gag open a turtle's mouth by placing it in the corner of the jaw. They must be constructed of durable nylon, zylene resin, or thermoplastic polymer, and strong enough to withstand biting without splintering. To accommodate a variety of turtle beak sizes, a set must include one large (5 1/2 - 8 inches (13.97 - 20.32 cm) in length) and one small (3 1/2 - 4 1/2 inches (8.89 - 11.43 cm) in length) canine chew bones.

(D) *A set of two rope loops covered with hose.* A set of two rope loops covered with a piece of hose is intended to be used as a mouth opener and to keep a turtle's mouth open during hook and/or line removal. A set consists of two 3–foot (0.91–m) lengths of poly braid rope, each covered with an 8–inch (20.32–cm) section of 1/2–inch (1.27–cm) or 3/4–inch (1.91–cm) light-duty garden hose, and each tied into a loop.

(E) *A hank of rope.* A hank of rope is intended to be used to gag open a sea turtle's mouth by placing it in the corner of the jaw. A hank of rope is made from a 6–foot (1.83–m) lanyard of braided nylon rope that is folded to create a hank, or looped bundle, of rope. The hank must be 2 to 4 inches (5.08 - 10.16 cm) in thickness.

(F) *A set of four PVC splice couplings.* PVC splice couplings are intended to be used to allow access to the back of the mouth of a turtle for hook and line removal by positioning them inside a turtle's mouth and holding them in place with long-nose or needle-nose pliers. The set must consist of the following Schedule 40 PVC splice coupling sizes: 1 inch (2.54 cm), 1 1/4 inches (3.18 cm), 1 1/2 inches (3.81 cm), and 2 inches (5.08 cm).

(G) *A large avian oral speculum.* A large avian oral speculum is intended to be used to hold a turtle's mouth open and control the head with one hand while removing a hook with the other hand. It must be 9 inches (22.86 cm) in length and constructed of 3/16–inch (4.76–mm) wire diameter surgical stainless steel (Type 304). It must be covered with 8 inches (20.32 cm) of clear vinyl tubing (5/16–inch (7.94–mm) outside diameter, 3/16–inch (4.76–mm) inside diameter).

(b) *Handling requirements.* If a sea turtle is observed to be hooked or entangled in fishing gear from any vessel fishing under the Pelagics FMP, vessel owners and operators must use the required mitigation gear set forth in paragraph (a) of this section to comply with these handling requirements. Any hooked or entangled sea turtle must be handled in a manner to minimize injury and promote survival.

(1) *Sea turtles that cannot be brought aboard.* In instances where a sea turtle is too large to be brought aboard or the sea turtle cannot be brought aboard without causing further injury to the sea turtle, the vessel owner or operator must disentangle and remove the gear, or cut the line as close as possible to the hook or entanglement, to remove the maximum amount of the gear from the sea turtle.

(2) *Sea turtles that can be brought aboard.* In instances where a sea turtle is not too large to be brought aboard, or the sea turtle can be brought aboard without causing further injury to the turtle, the vessel owner or operator must take the following actions:

(i) Immediately bring the sea turtle aboard;

(ii) Handle the sea turtle in accordance with the procedures in paragraphs (b)(3) and (b)(4) of this section; and

(iii) Disentangle and remove the gear, or cut the line as close as possible to the hook or entanglement, to remove the maximum amount of the gear from the sea turtle.

(3) *Sea turtle resuscitation.* If a sea turtle appears dead or comatose, the following actions must be taken:

(i) Place the sea turtle on its belly (on the bottom shell or plastron) so that the sea turtle is right side up and its hindquarters elevated at least 6 inches (15.24 cm) for a period of no less than 4 hours and no more than 24 hours. The amount of the elevation varies with the size of the sea turtle; greater elevations are needed for larger sea turtles;

(ii) Administer a reflex test at least once every 3 hours. The test is to be performed by gently touching the eye and pinching the tail of a sea turtle to determine if the sea turtle is responsive;

(iii) Keep the sea turtle shaded and damp or moist (but under no circumstances place the sea turtle into a container holding water). A water-soaked towel placed over the eyes, carapace and flippers is the most effective method of keeping a sea turtle moist; and

(iv) Return to the sea any sea turtle that revives and becomes active in the manner described in paragraph (b)(4) of this section. Sea turtles that fail to revive within the 24–hour period must also be returned to the sea in the manner described in paragraph (b)(4) of this section.

(4) *Sea turtle release.* After handling a sea turtle in accordance with the requirements of paragraphs (b)(2) and (b)(3) of this section, the sea turtle must be returned to the ocean after identification unless NMFS requests the retention of a dead sea turtle for research. In releasing a sea turtle the vessel owner or operator must:

(i) Place the vessel engine in neutral gear so that the propeller is disengaged and the vessel is stopped, and release the sea turtle away from deployed gear; and

(ii) Observe that the turtle is safely away from the vessel before engaging the propeller and continuing operations.

(5) *Other sea turtle requirements.* No sea turtle, including a dead turtle, may be consumed or sold. A sea turtle may be landed, offloaded, transhipped or kept below deck only if NMFS requests the retention of a dead sea turtle for research.

INSERT PICTURE OF ARCENEAUX LINE CUTTER

§ 660.33 Western Pacific longline fishing restrictions.

(a) *Annual Effort Limit on shallow-setting by Hawaii longline vessels.* (1) A maximum annual limit of 2,120 is established on the number of shallow-set certificates that will be made available each calendar year to vessels registered for use under Hawaii longline limited access permits.

(2) The Regional Administrator will divide the 2,120–set annual effort limit each calendar year into equal shares such that each holder of a Hawaii longline limited access permit who provides notice of interest to the Regional Administrator no later than November 1 prior to the start of the calendar year, pursuant to paragraph (a)(3) of this section, receives one share for each permit held. If such division would result in shares containing a fraction of a set, the annual effort limit will be adjusted downward such that each share consists of a whole number of sets.

(3) Any permit holder who provides notice according to this paragraph is eligible to receive shallow-set certificates. In order to be eligible to receive shallow-set certificates for a given calendar year, holders of Hawaii longline limited access permits must provide written notice to the Regional Administrator of their interest in receiving such certificates no later than November 1 prior to the start of the calendar year, except for 2004, the notification deadline for which is May 1, 2004.

(4) No later than December 1 of each year, the Regional Administrator will send shallow-set certificates valid for the upcoming calendar year to all holders of Hawaii longline limited access permits, as of the just previous November 1, that provided notice of interest to the Regional Administrator pursuant to paragraph (a)(3) of this section. The Regional Administrator will send shallow-set certificates valid for 2004 no later than June 1, 2004, based on permit holders as of May 1, 2004.

(b) *Limits on sea turtle interactions.* (1) Maximum annual limits are established on the numbers of physical interactions that occur each calendar year between leatherback and loggerhead sea turtles and vessels registered for use under Hawaii longline limited access permits while shallow-setting. The limits are based on the annual numbers of the two turtle species expected to be captured in the shallow-set component of the Hawaii-based fishery, as indicated in the incidental take statement of the biological opinion issued by the National Marine Fisheries Service pursuant to section 7 of the Endangered Species Act. If the numbers in the incidental take statement are modified or if a new biological opinion is issued, new rule-making will be undertaken to change the interaction limits accordingly. The limits are as follows:

(i) The annual limit for leatherback sea turtles (*Dermochelys coriacea*) is sixteen (16).

(ii) The annual limit for loggerhead sea turtles (*Caretta caretta*) is seventeen (17).

(2) Upon determination by the Regional Administrator that, based on data from NMFS observers, either of the two sea turtle interaction limits has been reached during a given calendar year:

(i) As soon as practicable, the Regional Administrator will file for publication at the Office of the Federal Register a notification of the sea turtle interaction limit having been reached. The notification will include an advisement that the shallow-set component of the longline fishery shall be closed and shallow-setting north of the equator by vessels registered for use under Hawaii longline limited access permits will be prohibited beginning at a specified date, not earlier than 7 days after the date of filing of the notification of the closure for public inspection at the Office of the Federal Register, until the end of the calendar year in which the sea turtle interaction limit was reached. Coincidental with the filing of the notification of the sea turtle interaction limit having been reached at the Office of the Federal Register, the Regional Administrator will also provide notice that the shallow-set component of the longline fishery shall be closed and shallow-setting north of the equator by vessels registered for use under Hawaii longline limited access permits will be prohibited beginning at a specified date, not earlier than 7 days after the date of filing of a notification of the closure for public inspection at the Office of the Federal Register, to all holders of Hawaii longline limited access permits via electronic mail, facsimile transmission, or post.

(ii) Beginning on the fishery closure date indicated in the notification published in the Federal Register under paragraph (b)(3)(i) of this section until the end of the calendar year in which the sea turtle interaction limit was reached, the shallow-set component of the longline fishery shall be closed.

(c) Owners and operators of vessels registered for use under a Hawaii longline limited access permit may engage in shallow-setting north of the equator (0° lat.) providing that there is on board one valid shallow-set certificate for every shallow-set that is made north of the equator (0° lat.) during the trip. For each shallow-set made north of the equator (0° lat.) vessel operators must submit one valid shallow-set certificate to the Regional Administrator. The certificate must be attached to the original logbook form that corresponds to the shallow-set and that is submitted to the Regional Administrator within 72 hours of each landing of management unit species as required under §660.14.

(d) Vessels registered for use under a Hawaii longline limited access permit may not have on board at any time during a trip for which notification to NMFS under §660.23(a) indicated that deep-setting would be done any float lines less than 20 meters in length or light sticks. As used in this paragraph "float line" means a line used to suspend the main longline beneath a float and "light stick" means any type of light emitting device, including any fluorescent "glow bead", chemical, or electrically powered light that is affixed underwater to the longline gear.

(e) Shallow-set certificates may be transferred only to holders of Hawaii longline limited access permits.

(f) Any owner or operator of a vessel registered for use under any longline permit issued under §660.21 must use only offset circle hooks sized 18/0 or larger, with a 10° offset, when shallow-setting north of the Equator (0° lat.). As used in this paragraph, an offset circle hook sized 18/0 or larger is one with an outer diameter at its widest point is no smaller than 1.97 inches (50 mm) when measured with the eye of the hook on the vertical axis (y-axis) and perpendicular to the horizontal axis (x-axis). As used in this paragraph, a 10° offset is measured from the barbed end of the hook and is relative to the parallel plane of the eyed-end, or shank, of the hook when laid on its side.

(g) Any owner or operator of a vessel registered for use under any longline permit issued under §660.21 must use only mackerel-type bait when shallow-setting north of the Equator (0° lat.). As used in this paragraph, mackerel-type bait means a whole fusiform fish with a predominantly blue, green or gray back and predominantly gray, silver or white lower sides and belly.

(h) Owners and operators of vessels registered for use under a Hawaii longline limited access permit may make sets only of the type (shallow-setting or deep-setting) indicated in the notification to NMFS pursuant to §660.23(a).

(i) Vessels registered for use under Hawaii longline limited access permits may not be used to engage in shallow-setting north of the equator (0° lat.) any time during which the shallow-set component of the longline fishery is closed pursuant to paragraph (b)(3)(ii) of this section.

(j) Owners and operators of vessels registered for use under a Hawaii longline limited access permit may land or possess no more than 10 swordfish from a fishing trip for which the permit holder notified NMFS under §660.23(a) that the vessel would engage in a deep-setting trip.

§ 660.34 Protected species workshop.

(a) Each year, both the owner and the operator of a vessel registered for use under any longline permit issued under §660.21 must attend and be certified for completion of a workshop conducted by NMFS on interaction mitigation techniques for sea turtles, seabirds and other protected species.

(b) A protected species workshop certificate will be issued by NMFS annually to any person who has completed the workshop.

(c) An owner of a vessel registered for use under any longline permit issued under §660.21 must have a valid protected species workshop certificate issued by NMFS to the owner of the vessel, in order to maintain or renew their vessel registration.

(d) An owner and an operator of a vessel registered for use under any longline permit issued under §660.21 must have on board the vessel a valid protected species workshop certificate issued by NMFS to the operator of the vessel, or a legible copy thereof.

§ 660.35 Pelagic longline seabird mitigation measures.

(a) *Seabird mitigation techniques.* When deep-setting or shallow-setting north of 23° N. lat. or shallow-setting south of 23 N. lat., owners and operators of vessels registered for use under a Hawaii longline limited access permit, must either side-set according to paragraph (a)(1) of this section, or fish in accordance with paragraph (a)(2) of this section.

(1) *Side-setting.* Owners and operators of vessels opting to side-set under this section must fish according to the following specifications:

(i) The mainline must be deployed as far forward on the vessel as practicable, and at least 1 m (3.3 ft) forward from the stern of the vessel;

(ii) The mainline and branch lines must be set from the port or the starboard side of the vessel;

(iii) If a mainline shooter is used, the mainline shooter must be mounted as far forward on the vessel as practicable, and at least 1 m (3.3 ft) forward from the stern of the vessel;

(iv) Branch lines must have weights with a minimum weight of 45 g (1.6 oz);

(v) One weight must be connected to each branch line within 1 m (3.3 ft) of each hook;

(vi) When seabirds are present, the longline gear must be deployed so that baited hooks remain submerged and do not rise to the sea surface; and

(vii) A bird curtain must be deployed. Each bird curtain must consist of the following three components: a pole that is fixed to the side of the vessel aft of the line shooter and which is at least 3 m (9.8 ft) long; at least three main streamers that are attached at regular intervals to the upper 2 m (6.6 ft) of the pole and each of which has a minimum diameter of 20 mm (0.8 in); and branch streamers attached to each main streamer at the end opposite from the pole, each of which is long enough to drag on the sea surface in the absence of wind, and each of which has a minimum diameter 10 mm (0.4 in).

(2) *Alternative to side-setting.* Owners and operators of vessels that do not side-set must:

(i) Discharge fish, fish parts (offal), or spent bait while setting or hauling longline gear, on the opposite side of the vessel from where the longline gear is being set or hauled, when seabirds are present;

(ii) Retain sufficient quantities of fish, fish parts, or spent bait, between the setting of longline gear for the purpose of strategically discharging it in accordance with paragraph (i) of this section;

(iii) Remove all hooks from fish, fish parts, or spent bait prior to its discharge in accordance with paragraph (i) of this section;

(iv) Remove the bill and liver of any swordfish that is caught, sever its head from the trunk and cut it in half vertically and periodically discharge the butchered heads and livers in accordance with paragraph (i) of this section;

(v) When using basket-style longline gear north of 23° N. lat., ensure that the main longline is deployed slack to maximize its sink rate; and

(vi) Use completely thawed bait that has been dyed blue to an intensity level specified by a color quality control card issued by NMFS; and

(vii) Maintain a minimum of two cans (each sold as 0.45 kg or 1 lb size) containing blue dye on board the vessel; and

(viii) Follow the requirements in paragraphs (a)(3) and (a)(4) of this section, as applicable.

(3) *Deep-setting requirements.* The following additional requirements apply to vessels engaged in deep-setting using a monofilament main longline north of 23° N. lat. that do not side-set. Owners and operators of these vessels must:

(i) Employ a line shooter; and

(ii) Attach a weight of at least 45 g (1.6 oz) to each branch line within 1 m (3.3 ft) of the hook.

(4) *Shallow-setting requirement.* In addition to the requirements set forth in paragraphs (a)(1) and (a)(2) of this section, owners and operators of vessels engaged in shallow-setting that do not side-set must begin the deployment of longline gear at least 1 hour after local sunset and complete the deployment no later than local sunrise, using only the minimum vessel lights to conform with navigation rules and best safety practices.

(b) *Short-tailed albatross handling techniques.* If a short-tailed albatross is hooked or entangled by a vessel registered for use under a Hawaii longline limited access permit, owners and operators must ensure that the following actions are taken:

(1) Stop the vessel to reduce the tension on the line and bring the bird on board the vessel using a dip net;

(2) Cover the bird with a towel to protect its feathers from oils or damage while being handled;

(3) Remove any entangled lines from the bird;

(4) Determine if the bird is alive or dead.

(i) If dead, freeze the bird immediately with an identification tag attached directly to the specimen listing the species, location and date of mortality, and band number if the bird has a leg band. Attach a duplicate identification tag to the bag or container holding the bird. Any leg bands present must remain on the bird. Contact NMFS, the Coast Guard, or the U.S. Fish and Wildlife Service at the numbers listed on the Short-tailed Albatross Handling Placard distributed at the NMFS protected species workshop, inform them that you have a dead short-tailed albatross on board, and submit the bird to NMFS within 72 hours following completion of the fishing trip.

(ii) If alive, handle the bird in accordance with paragraphs (b)(5) through (b)(10) of this section.

(5) Place the bird in a safe enclosed place;

(6) Immediately contact NMFS, the Coast Guard, or the U.S. Fish and Wildlife Service at the numbers listed on the Short-tailed Albatross Handling Placard distributed at the NMFS protected species workshop and request veterinary guidance;

(7) Follow the veterinary guidance regarding the handling and release of the bird.

(8) Complete the short-tailed albatross recovery data form issued by NMFS.

(9) If the bird is externally hooked and no veterinary guidance is received within 24–48 hours, handle the bird in accordance with paragraphs (c)(4) and (c)(5) of this section, and release the bird only if it meets the following criteria:

(i) Able to hold its head erect and respond to noise and motion stimuli;

(ii) Able to breathe without noise;

(iii) Capable of flapping and retracting both wings to normal folded position on its back;

(iv) Able to stand on both feet with toes pointed forward; and

(v) Feathers are dry.

(10) Any seabird that is released in accordance with paragraph (b)(9) of this section or under the guidance of a veterinarian must be placed on the sea surface.

(11) If the hook has been ingested or is inaccessible, keep the bird in a safe, enclosed place and submit it to NMFS immediately upon the vessel's return to port. Do not give the bird food or water.

(12) Complete the short-tailed albatross recovery data form issued by NMFS.

(c) *Non-short-tailed albatross seabird handling techniques.* If a seabird other than a short-tailed albatross is hooked or entangled by a vessel registered for use under a Hawaii longline limited access permit owners and operators must ensure that the following actions are taken:

(1) Stop the vessel to reduce the tension on the line and bring the seabird on board the vessel using a dip net;

(2) Cover the seabird with a towel to protect its feathers from oils or damage while being handled;

(3) Remove any entangled lines from the seabird;

(4) Remove any external hooks by cutting the line as close as possible to the hook, pushing the hook barb out point first, cutting off the hook barb using bolt cutters, and then removing the hook shank;

(5) Cut the fishing line as close as possible to ingested or inaccessible hooks;

(6) Leave the bird in a safe enclosed space to recover until its feathers are dry; and

(7) After recovered, release seabirds by placing them on the sea surface.

§ 660.36 American Samoa longline limited entry program.

(a) *General.* Under §660.21(c), certain U.S. vessels are required to be registered for use under a valid American Samoa longline limited access permit. With the exception of reductions in permits in vessel size Class A under paragraph (c)(1) of this section, the maximum number of permits will be capped at the number of initial permits actually issued under paragraph (f)(1) of this section.

(b) *Terminology.* For purposes of this section, the following terms have these meanings:

(1) *Documented participation* means participation proved by, but not necessarily limited to, a properly submitted NMFS or American Samoa logbook, an American Samoa creel survey record, a delivery or payment record from an American Samoa-based cannery, retailer or wholesaler, an American Samoa tax record, an individual wage record, ownership title, vessel registration, or other official documents showing:

(i) Ownership of a vessel that was used to fish in the EEZ around American Samoa, or

(ii) Evidence of work on a fishing trip during which longline gear was used to harvest Pacific pelagic management unit species in the EEZ around American Samoa. If the applicant does not possess the necessary documentation of evidence of work on a fishing trip based on records available only from NMFS or the Government of American Samoa (e.g., creel survey record or logbook), the applicant may request PIRO to obtain such records from the appropriate agencies, if available. The applicant should provide sufficient information on the fishing trip to allow PIRO to retrieve the records.

(2) *Family* means those people related by blood, marriage, and formal or informal adoption.

(c) *Vessel size classes.* The Regional Administrator shall issue American Samoa longline limited access permits in the following size classes:

(1) Class A: Vessels less than or equal to 40 ft (12.2 m) length overall. The maximum number will be reduced as Class B–1, C–1, and D–1 permits are issued under paragraph (e) of this section.

(2) Class B: Vessels over 40 ft (12.2 m) to 50 ft (15.2 m) length overall.

(3) Class B–1: Maximum number of 14 permits for vessels over 40 ft (12.2 m) to 50 ft (15.2 m) length overall, to be made available according to the following schedule:

(i) Four permits in the first calendar year after the Regional Administrator has issued all initial permits in Classes A, B, C, and D (initial issuance),

(ii) In the second calendar year after initial issuance, any unissued, relinquished, or revoked permits of the first four, plus four additional permits,

(iii) In the third calendar year after initial issuance, any unissued, relinquished, or revoked permits of the first eight, plus four additional permits, and

(iv) In the fourth calendar year after initial issuance, any unissued, relinquished, or revoked permits of the first 12, plus two additional permits.

(4) Class C: Vessels over 50 ft (15.2 m) to 70 ft (21.3 m) length overall.

(5) Class C–1: Maximum number of six permits for vessels over 50 ft (15.2) to 70 ft (21.3 m) length overall, to be made available according to the following schedule:

(i) Two permits in the first calendar year after initial issuance,

(ii) In the second calendar year after initial issuance, any unissued, relinquished, or revoked permits of the first two, plus two additional permits, and

(iii) In the third calendar year after initial issuance, any unissued, relinquished, or revoked permits of the first four, plus two additional permits.

(6) Class D: Vessels over 70 ft (21.3 m) length overall.

(7) Class D–1: Maximum number of 6 permits for vessels over 70 ft (21.3 m) length overall, to be made available according to the following schedule:

(i) Two permits in the first calendar year after initial issuance,

(ii) In the second calendar year after initial issuance, any unissued, relinquished, or revoked permits of the first two, plus two additional permits, and

(iii) In the third calendar year after initial issuance, any unissued, relinquished, or revoked permits of the first four, plus two additional permits.

(d) A vessel subject to this section may only be registered with an American Samoa longline limited access permit of a size class equal to or larger than the vessel's length overall.

(e) *Initial permit qualification.* Any U.S. national or U.S. citizen or company, partnership, or corporation qualifies for an initial American Samoa longline limited access permit if the person, company, partnership, or corporation, on or prior to March 21, 2002, owned a vessel that was used during the time of their ownership to harvest Pacific pelagic management unit species with longline gear in the EEZ around American Samoa and that fish was landed in American Samoa:

(1) Prior to March 22, 2002, or

(2) Prior to June 28, 2002, provided that the person or business provided to NMFS or the Council, prior to March 22, 2002, a written notice of intent to participate in the pelagic longline fishery in the EEZ around American Samoa.

(f) *Initial permit issuance.* (1) Any application for issuance of an initial permit must be submitted to the Pacific Islands Regional Office no later than 120 days after the effective date of this final rule. The Regional Administrator shall publish a notice in the Federal Register, send notices to persons on the American Samoa pelagics mailing list, and use other means to notify prospective applicants of the availability of permits. Applications for initial permits must be made, and application fees paid, in accordance with §§660.13(c)(1), (d) and (f)(2). A complete application must include documented participation in the fishery in accordance with §660.36(b)(1). If the applicant is any entity other than a sole owner, the application must be accompanied by a supplementary information sheet obtained from the Regional Administrator, containing the names and mailing addresses of all owners, partners, and corporate officers.

(2) Only permits of Class A, B, C, and D will be made available for initial issuance. Permits of Class B–1, C–1, and D–1, will be made available in subsequent calendar years.

(3) Within 30 days of receipt of a completed application, the Assistant Regional Administrator for Sustainable Fisheries, PIRO, shall make a decision on whether the applicant qualifies for an initial permit and will notify the successful applicant by a dated letter. The successful applicant must register a vessel, of the equivalent size class or smaller to which the qualifying vessel would have belonged, to the permit within 120 days of the date of the letter of notification, and maintain this vessel registration to the permit for at least 120 days. The successful applicant must also submit a supplementary information sheet, obtained from the Regional Administrator, containing the name and mailing address of the owner of the vessel to which the permit is registered. If the registered vessel is owned by any entity other than a sole owner, the names and mailing addresses of all owners, partners, and corporate officers must be included.

(4) An appeal of a denial of an application for an initial permit shall be processed in accordance with §660.21(n) of this subpart.

(5) After all appeals on initial permits are concluded in any vessel size class, the maximum number of permits in that class shall be the number of permits issued during the initial issuance process (including appeals). The maximum number of permits will not change, except that the maximum number of Class A permits will be reduced if Class A permits are replaced by B–1, C–1, or D–1 permits under paragraph (h) of this section. Thereafter, if any Class A, B, C, or D permit becomes available, the Regional Administrator shall re-issue that permit according to the process set forth in paragraph (g) of this section.

(g) *Additional permit issuance.* (1) If the number of permits issued in Class A, B, C, or D, falls below the maximum number of permits, the Regional Administrator shall publish a notice in the

Federal Register, send notices to persons on the American Samoa pelagics mailing list, and use other means to notify prospective applicants of any available permit(s) in that class. Any application for issuance of an additional permit must be submitted to PIRO no later than 120 days after the date of publication of the notice on the availability of additional permits in the Federal Register. A complete application must include documented participation in the fishery in accordance with §660.36(b)(1). The Regional Administrator shall issue permits to persons according the following priority standard:

(i) First priority accrues to the person with the earliest documented participation in the pelagic longline fishery in the EEZ around American Samoa on a Class A sized vessel.

(ii) The next priority accrues to the person with the earliest documented participation in the pelagic longline fishery in the EEZ around American Samoa on a Class B size, Class C size, or Class D size vessel, in that order.

(iii) In the event of a tie in the priority ranking between two or more applicants, then the applicant whose second documented participation in the pelagic longline fishery in the EEZ around American Samoa is first in time will be ranked first in priority. If there is still a tie between two or more applicants, the Regional Administrator will select the successful applicant by an impartial lottery.

(2) Applications must be made, and application fees paid, in accordance with §§660.13(c)(1), (d), and (f)(2). If the applicant is any entity other than a sole owner, the application must be accompanied by a supplementary information sheet, obtained from the Regional Administrator, containing the names and mailing addresses of all owners, partners, and corporate officers that comprise ownership of the vessel for which the permit application is prepared.

(3) Within 30 days of receipt of a completed application, the Assistant Regional Administrator for Sustainable Fisheries shall make a decision on whether the applicant qualifies for a permit and will notify the successful applicant by a dated letter. The successful applicant must register a vessel of the equivalent vessel size or smaller to the permit within 120 days of the date of the letter of notification. The successful applicant must also submit a supplementary information sheet, obtained from the Regional Administrator, containing the name and mailing address of the owner of the vessel to which the permit is registered. If the registered vessel is owned by any entity other than a sole owner, the names and mailing addresses of all owners, partners, and corporate officers must be included. If the successful applicant fails to register a vessel to the permit within 120 days of the date of the letter of notification, the Assistant Regional Administrator for Sustainable Fisheries shall issue a letter of notification to the next person on the priority list or, in the event that there are no more prospective applicants on the priority list, re-start the issuance process pursuant to paragraph (g)(1) of this section. Any person who fails to register the permit to a vessel under this paragraph within 120 days shall not be eligible to apply for a permit for 6 months from the date those 120 days expired.

(4) An appeal of a denial of an application for a permit shall be processed in accordance with §660.21(n).

(h) *Class B–1, C–1, and D–1 Permits.* (1) Permits of Class B–1, C–1, and D–1 will be initially issued only to persons who hold a Class A permit and who, prior to March 22, 2002, participated in the pelagic longline fishery around American Samoa.

(2) The Regional Administrator shall issue permits to persons for Class B–1, C–1, and D–1 permits based on each person's earliest documented participation, with the highest priority given to that person with the earliest date of documented participation.

(3) A permit holder who receives a Class B–1, C–1, or D–1 permit must relinquish his or her Class A permit and that permit will no longer be valid. The maximum number of Class A permits will be reduced accordingly.

(4) Within 30 days of receipt of a completed application for a Class B–1, C–1, and D–1 permit, the Regional Administrator shall make a decision on whether the applicant qualifies for a permit and will notify the successful applicant by a dated letter. The successful applicant must register a vessel of the equivalent vessel size or smaller to the permit within 120 days of the date of the letter of notification. The successful applicant must also submit a supplementary information sheet, obtained from the Regional Administrator, containing the name and mailing address of the owner of the vessel to which the permit is registered. If the registered vessel is owned by any entity other than a sole owner, the names and mailing addresses of all owners, partners, and corporate officers must be included.

(5) An appeal of a denial of an application for a Class B–1, C–1, or D–1 permit shall be processed in accordance with §660.21(n).

(6) If a Class B–1, C–1, or D–1 permit is relinquished, revoked, or not renewed pursuant to paragraph (j)(1) of this section, the Regional Administrator shall make that permit available according to the procedure described in paragraphs (g)(1) through (g)(4) of this section.

(i) *Permit transfer.* The holder of an American Samoa longline limited access permit may transfer the permit to another individual, partnership, corporation, or other entity as described in this section. Applications for permit transfers must be submitted to the Regional Administrator within 30 days of the transferral date. If the applicant is any entity other than a sole owner, the application must be accompanied by a supplementary information sheet, obtained from the Regional Administrator, containing the names and mailing addresses of all owners, partners, and corporate officers. After such an application has been made, the permit is not valid for use by the new permit holder until the Regional Administrator has issued the permit in the new permit holder's name under §660.13(c).

(1) *Permits of all size classes except Class A.* An American Samoa longline limited access permit of any size class except Class A may be transferred (by sale, gift, bequest, intestate succession, barter, or trade) to the following persons only:

(i) A Western Pacific community located in American Samoa that meets the criteria set forth in section 305(I)(2) of the Magnuson-Stevens Act, 16 U.S.C. 1855(I)(2), and its implementing regulations, or

(ii) Any person with documented participation in the pelagic longline fishery in the EEZ around American Samoa.

(2) *Class A Permits.* An American Samoa longline limited access permit of Class A may be transferred (by sale, gift, bequest, intestate succession, barter, or trade) to the following persons only:

(i) A family member of the permit holder,

(ii) A Western Pacific community located in American Samoa that meets the criteria set forth in section 305(I)(2) of the Magnuson-Stevens Act, 16 U.S.C. 1855(I)(2), and its implementing regulations, or

(iii) Any person with documented participation in the pelagic longline fishery on a Class A size vessel in the EEZ around American Samoa prior to March 22, 2002.

(3) *Class B–1, C–1, and D–1 Permits.* Class B–1, C–1, and D–1 permits may not be transferred to a different owner for 3 years from the date of initial issuance, except by bequest or intestate succession if the permit holder dies during those 3 years. After the initial 3 years, Class B–1, C–1, and D–1 permits may be transferred only in accordance with the restrictions in paragraph (I)(1) of this section.

(j) *Permit renewal and registration of vessels*—(1) *Use requirements.* An American Samoa longline limited access permit will not be renewed following 3 consecutive calendar years (beginning with the year after the permit was issued in the name of the current permit holder) in which the vessel(s) to which it is registered landed less than:

(i) For permit size Classes A or B: a total of 1,000 lb (455 kg) of Pacific pelagic management unit species harvested in the EEZ around American Samoa using longline gear, or

(ii) For permit size Classes C or D: a total of 5,000 lb (2,273 kg) of Pacific pelagic management unit species harvested in the EEZ around American Samoa using longline gear.

(k) *Concentration of ownership of permits.* No more than 10 percent of the maximum number of permits, of all size classes combined, may be held by the same permit holder. Fractional interest will be counted as a full permit for the purpose of calculating whether the 10–percent standard has been reached.

(l) *Three year review.* Within 3 years of the effective date of this final rule the Council shall consider appropriate revisions to the American Samoa limited entry program after reviewing the effectiveness of the program with respect to its biological and socioeconomic objectives, concerning gear conflict, overfishing, enforceability, compliance, and other issues.

§ 660.37 American Samoa pelagic fishery area management.

(a) *Large vessel prohibited areas.* A large vessel of the United States may not be used to fish for Pacific pelagic management unit species in the American Samoa large vessel prohibited areas as defined in paragraphs (b) and (c) of this section, except as allowed pursuant to an exemption issued under § 660.38.

(b) *Tutuila Island, Manu'a Islands, and Rose Atoll (AS-1).* The large vessel prohibited area around Tutuila Island, the Manu'a Islands, and Rose Atoll consists of the waters of the EEZ around American Samoa enclosed by straight lines connecting the following coordinates:

Point	S. lat.	W. long.
AS-1-A	13°30[min]	167°25[min]
AS-1-B	15°13[min]	167°25[min]

and from Point AS-1-A westward along the latitude 13°30' S. until intersecting the U.S. EEZ boundary with Samoa, and from Point AS-1-B westward along the latitude 15°13' S. until intersecting the U.S. EEZ boundary with Samoa.

(c) *Swains Island (AS-2).* The large vessel prohibited area around Swains Island consists of the waters of the EEZ around American Samoa enclosed by straight lines connecting the following coordinates:

Point	S. lat.	W. long.
AS-2-A	11°4 8[min]	171° 50[min]
AS-2-B	11°4 8[min]	170° 20[min]

and from Point AS-2-A northward along the longitude 171°50' W. until intersecting the U.S. EEZ boundary with Tokelau, and from Point AS-2-B northward along the longitude 170°20' W. until intersecting the U.S. EEZ boundary with Tokelau.

§ 660.38 Exemptions for American Samoa large vessel prohibited areas.

(a) An exemption will be issued to a person who currently owns a large vessel, to use that vessel to fish for Pacific pelagic management unit species in the American Samoa large vessel prohibited management areas, if he or she had been the owner of that vessel when it was registered for use with a Western Pacific general longline permit and made at least one landing of Pacific pelagic management unit species in American Samoa on or prior to November 13, 1997.

(b) A landing of Pacific pelagic management unit species for the purpose of this section must have been properly recorded on a NMFS Western Pacific Federal daily longline form that was submitted to NMFS, as required in § 660.14.

(c) An exemption is valid only for a vessel that was registered for use with a Western Pacific general longline permit and landed Pacific pelagic management unit species in American Samoa on or prior to November 13, 1997, or for a replacement vessel of equal or smaller LOA than the vessel that was initially registered for use with a Western Pacific general longline permit on or prior to November 13, 1997.

(d) An exemption is valid only for the vessel for which it is registered. An exemption not registered for use with a particular vessel may not be used.

(e) An exemption may not be transferred to another person.

(f) If more than one person, e.g., a partnership or corporation, owned a large vessel when it was registered for use with a Western Pacific general longline permit and made at least one landing of Pacific pelagic management unit species in American Samoa on or prior to November 13, 1997, an exemption issued under this section will be issued to only one person.

Subpart D—Western Pacific Crustacean Fisheries

§ 660.41 Permits.

(a) *Applicability.* (1) The owner of any vessel used to fish for lobster in Permit Area 1 must have a limited access permit issued for such vessel. Only one permit will be assigned to any vessel.

(2) The owner of any vessel used to fish for lobster in Permit Area 2 or Permit Area 3, must have a permit issued for such a vessel.

(3) No vessel owner will have permits for a single vessel to harvest lobsters in Permit Areas 1 and 2 at the same time.

(4) A limited access permit is valid for fishing only in Permit Area 1.

(b) *General requirements.* General requirements governing application information, issuance, fees, expiration, replacement, transfer, alteration, display, sanctions, and appeals for permits issued under this section, as applicable, are contained in §660.13.

(c) *Application.* An application for a permit required under this section will be submitted to the Pacific Area Office as described in §660.13. If the application for a limited access permit is submitted on behalf of a partnership or corporation, the application must be accompanied by a supplementary information sheet obtained from the Pacific Area Office and contain the names and mailing addresses of all partners or shareholders and their respective percentage of ownership in the partnership or corporation.

(d) *Number of permits.* A maximum of 15 limited access permits can be valid at any time.

(e) *Transfer or sale of limited access permits.* (1) Permits may be transferred or sold, but no one individual, partnership, or corporation will be allowed to hold a whole or partial interest in more than one permit, except that an owner who qualifies initially for more than one permit may maintain those permits, but may not obtain additional permits. Layering of partnerships or corporations shall not insulate a permit holder from this requirement.

(2) If 50 percent or more of the ownership of a limited access permit is passed to persons other than those listed on the permit application, the Pacific Area Office must be notified of the change in writing and provided copies of the appropriate documents confirming the changes within 30 days.

(3) Upon the transfer or sale of a limited access permit, a new application must be submitted by the new permit owner according to the requirements of §660.13. The transferred permit is not valid until this process is completed.

(f) *Replacement of a vessel covered by a limited access permit.* A limited access permit issued under this section may, without limitation as to frequency, be transferred by the permit holder to a replacement vessel owned by that person.

(g) *Issuance of limited access permits to future applicants.* (1) The Regional Director may issue limited access permits under this section when fewer than 15 vessel owners hold active permits.

(2) When the Regional Director has determined that limited access permits may be issued to new persons, a notice shall be placed in the Federal Register, and other means will be used to notify prospective applicants of the opportunity to obtain permits under the limited access management program.

(3) A period of 90 days will be provided after publication of the Federal Register notice for submission of new applications for a limited access permit.

(4) Limited access permits issued under this paragraph (g) will be issued first to applicants qualifying under paragraph (g)(4)(i) of this section. If the number of limited access permits available is greater than the number of applicants that qualify under paragraph (g)(4)(i) of this section, then limited access permits will be issued to applicants under paragraph (g)(4)(ii) of this section.

(i) First priority to receive limited access permits under this paragraph (g) goes to owners of vessels that were used to land lobster from Permit Area 1 during the period 1983 through 1990, and who were excluded from the fishery by implementation of the limited access system. If there are insufficient permits for all such applicants, the new permits shall be issued by the Regional Director through a lottery.

(ii) Second priority to receive limited access permits under paragraph (g) goes to owners with the most points, based upon a point system. If two or more owners have the same number of points and there are insufficient permits for all such owners, the Regional Director shall issue the permits through a lottery. Under the point system, limited access permits will be issued, in descending order, beginning with owners who have the most points and proceeding to owners who have the least points, based on the following:

(A) Three points shall be assigned for each calendar year after August 8, 1985, that the applicant was the operator of a vessel that was used to land lobster from Permit Area 1.

(B) Two points shall be assigned for each calendar year or partial year after August 8, 1985, that the applicant was the owner, operator, or crew member of a vessel engaged in either commercial fishing in Permit Area 2 for lobster, or fishing in Permit Area 1 for fish other than lobster with an intention to sell all or part of the catch.

(C) One point shall be assigned for each calendar year or partial year after August 8, 1985, that the applicant was the owner, operator, or crew member of a vessel engaged in any other commercial fishing in the EEZ surrounding Hawaii.

(5) A holder of a new limited access permit must own at least a 50-percent share in the vessel that the permit would cover.

§ 660.42 Prohibitions.

In addition to the general prohibitions specified in §600.725 of this chapter and §660.16, it is unlawful for any person to do any of the following:

(a) Fish for, take, or retain any crustacean management unit species in any area shoreward of the outer boundary of the NWHI National Marine Sanctuary

(b) In Permit Area 1, it is unlawful for any person to—

(1) Fish for, take, or retain lobsters—

(i) Without a limited access permit issued under §660.41;

(ii) By methods other than lobster traps or by hand for lobsters, as specified in §660.48;

(iii) From closed areas for lobsters, as specified in §660.46;

(iv) During a closed season, as specified in §660.45; or

(v) After the closure date, as specified in §660.50, and until the fishery opens again in the following calendar year.

(2) Fail to report before landing or offloading as specified in §660.43.

(3) Fail to comply with any protective measures implemented under §660.51 or §660.52.

(4) Leave a trap unattended in the Management Area except as provided in §660.48.

(5) Maintain on board the vessel or in the water more than 1,200 traps per fishing vessel, of which no more than 1,100 can be assembled traps, as specified in §660.48.

(6) Land lobsters taken in Permit Area 1 after the closure date, as specified in §660.50, until the fishery opens again the following year.

(7) Refuse to make available to an authorized officer and employee of NMFS designated by the Regional Administrator for inspection and copying any records that must be made available in accordance with §660.14(f)(2).

(8) Possess on a fishing vessel that has a limited access permit issued under this subpart any lobster trap in Crustaceans Permit Area 1 when fishing for lobster is prohibited as specified in §§660.45(a), 660.50, 660.51, or 660.52, except as allowed under §660.48(a)(7).

(9) Possess on a fishing vessel that has a limited access permit issued under this subpart any lobster trap in Crustaceans Permit Area 1 VMS Subarea when fishing for lobsters is prohibited as specified in §§660.45(a), 660.50, 660.51, and 660.52, except as allowed under §660.48(a)(8).

(10) Interfere with, tamper with, alter, damage, disable, or impede the operation of a VMS unit or to attempt any of the same while engaged in the Permit Area 1 fishery; or to move or remove a VMS unit while engaged in the Permit Area 1 fishery without first notifying the Regional Administrator.

(11) Make a false statement, oral or written, to the Regional Administrator or an authorized officer, regarding the certification, use, operation, or maintenance of a VMS unit used in the fishery.

(12) Fail to allow an authorized officer to inspect and certify a VMS unit used in the fishery.

(13) Possess, on a fishing vessel that has a limited access permit issued under this subpart, any lobster trap in-Permit Area 1 that is closed under §660.50(b), unless the vessel has an operational VMS unit, certified by NMFS, on board.

(c) In Permit Area 2, it is unlawful for any person to—

(1) Fish for, take, or retain lobsters—

(i) By methods other than lobster traps or by hand, as specified in §660.48; or

(ii) During a closed season, as specified in §660.45(b).

(2) Retain or possess on a fishing vessel any lobster taken in Permit Area 2 that is less than the minimum size specified in §660.44.

(3) Possess on a fishing vessel any lobster or lobster part taken in Permit Area 2 in a condition where the lobster is not whole and undamaged as specified in §660.44.

(4) Retain or possess on a fishing vessel, or remove the eggs from, any egg-bearing lobster, as specified in §660.44.

(5) Possess on a fishing vessel that has a permit for Permit Area 2 issued under this subpart any lobster trap in Permit Area 2 when fishing for lobster in the main Hawaiian Islands is prohibited during the months of May, June, July, and August.

§ 660.43 Notifications.

(a) The operator of any vessel subject to the requirements of this subpart must:

(1) Report, not less than 24 hours, but not more than 36 hours, before landing, the port, the approximate date and the approximate time at which spiny and slipper lobsters will be landed.

(2) Report, not less than 6 hours and not more than 12 hours before offloading, the location and time that offloading of spiny and slipper lobsters will begin.

(b) The Regional Administrator will notify permit holders of any change in the reporting method and schedule required in paragraphs (a)(1) and (2) of this section at least 30 days prior to the opening of the fishing season.

§ 660.44 Lobster size and condition restrictions—Permit Area 2.

(a) Only spiny lobsters with a carapace length of 8.26 cm or greater may be retained (see Figure 3 of this subpart).

(b) Any lobster with a punctured or mutilated body, or a separated carapace and tail, may not be retained.

(c) A female lobster of any size may not be retained if it is carrying eggs externally. Eggs may not be removed from female lobsters.

§ 660.45 Closed seasons.

(a) Lobster fishing is prohibited in Permit Area 1 during the months of January through June, inclusive.

(b) Lobster fishing is prohibited in Permit Area 2 during the months of May, June, July, and August.

§ 660.46 Closed areas.

[reserved]

§ 660.47 Gear identification.

In Permit Area 1, the vessel's official number must be marked legibly on all traps and floats maintained on board the vessel or in the water by that vessel.

§ 660.48 Gear restrictions.

(a) *Permit Area 1.* (1) Lobsters may be taken only with lobster traps or by hand. Lobsters may not be taken by means of poisons, drugs, other chemicals, spears, nets, hook, or explosives.

(2) The smallest opening of an entry way of any lobster trap may not allow any sphere or cylinder greater than 6.5 inches (16.5 cm) in diameter to pass from outside the trap to inside the trap.

(3) Each lobster trap must have a minimum of two escape vent panels that meet the following requirements:

(i) Panels must have at least four unobstructed circular holes no smaller than 67 mm in diameter, with centers at least 82 mm apart.

(ii) The lowest part of any opening in an escape vent panel must not be more than 85 mm above the floor of the trap.

(iii) Panels must be placed opposite one another in each trap.

(4) A vessel fishing for or in possession of lobster in any permit area may not have on board the vessel any trap that does not meet the requirements of paragraphs (a)(1), (2), and (3) of this section.

(5) A maximum of 1,200 traps per vessel may be maintained on board or in the water, provided that no more than 1,100 assembled traps are maintained on board or in the water. If more than 1,100 traps are maintained, the unassembled traps may be carried as spares only, in order to replace assembled traps that may be lost or become unusable.

(6) Traps shall not be left unattended in any permit area, except in the event of an emergency, in which case the vessel operator must notify the SAC of the emergency that necessitated leaving the traps in Permit Area 1, and the location and number of the traps, within 24 hours after the vessel reaches port.

(7) A vessel whose owner has a limited access permit issued under this subpart and has an operating VMS unit certified by the NMFS may enter Crustaceans Permit Area 1 with lobster traps on board on or after June 25, but must remain outside the Crustaceans Permit Area 1 VMS Subarea until the NWHI lobster season opens on July 1.

(8) A vessel whose owner has a limited access permit issued under this subpart and has on board an operational VMS unit certified by NMFS may transit Crustaceans Permit Area 1, including Crustaceans Permit Area 1 VMS Subarea, with lobster traps on board for the purpose of moving to another Permit area or returning to port following the closure date, as specified in §660.50, providing the vessel does not stop or fish and is making steady progress to another lobster grounds or back to port as determined by NMFS.

(9) The operator of a permitted vessel must notify the Regional Administrator or an authorized officer no later than June 15 of each year if the vessel will use a VMS unit in the fishery and allow for inspection and certification of the unit.

(b) *Permit Area 2.* Lobsters may be taken only with lobster traps or by hand. Lobsters may not be taken by means of poisons, drugs, other chemicals, spears, nets, hooks, or explosives.

§ 660.49   At-sea observer coverage.

All fishing vessels subject to this subpart and subpart B of this part must carry an observer when requested to do so by the Regional Administrator.

§ 660.50 Harvest limitation program.

(a) *General.* Harvest guidelines for for Permit Area 1 will be set annually for the calendar year and shall:

(1) Apply to the total catch of spiny and slipper lobsters.

(2) Be expressed in terms of numbers of lobsters.

(b) *Harvest guideline.* (1) The Regional Administrator shall use information from daily lobster catch reports and lobster sales reports from previous years, and may use information from research sampling and other sources to establish the annual harvest guideline in accordance with the FMP after consultation with the Council.

(2) NMFS shall publish a document indicating the annual harvest guideline in the Federal Register by February 28 of each year and shall use other means to notify permit holders of the harvest guideline for the year.

(3) The Regional Administrator shall determine, on the basis of the information reported to NMFS by the operator of each vessel fishing, when the harvest guideline for each lobster ground will be reached.

(4) Notice of the date when the harvest guideline for a lobster ground is expected to be reached and specification of the closure date of Permit Area 1 will be provided to each permit holder and/or operator of each permitted vessel at least 24 hours in advance of the closure. After a closure, the harvest of lobster in Permit Area 1 is prohibited, and the possession of lobster traps on board the vessel in Permit Area 1 is prohibited unless allowed under §660.48(a)(8).

(5) With respect to the notification in paragraph (b)(4) of this section, NMFS shall provide each permit holder and operator of each permitted vessel with the following information, as appropriate:

(i) Determination of when the harvest guideline for Crustaceans Permit Area 1 will be reached;

(ii) Closure date after which harvest of lobster or possession of lobster traps on board the vessel in Permit Area 1 is prohibited;

(iii) Closure date after which the possession of lobster traps on board the vessel in Crustaceans Permit Area 1 is prohibited by any permitted vessel that is not operating a VMS unit certified by NMFS; and

(iv) Specification of when further landings of lobster will be prohibited by permitted vessels not carrying an operational VMS unit, certified by NMFS, on board.

(c) *Monitoring and adjustment.* The operator of each vessel fishing during the open season shall report lobster catch (by species) and effort (number of trap hauls) data while at sea to NMFS in Honolulu. The Regional Administrator shall notify permit holders of the reporting method, schedule, and logistics at least 30 days prior to the opening of the fishing season.

§ 660.51 Monk seal protective measures.

(a) *General.* This section establishes a procedure that will be followed if the Regional Administrator receives a report of a monk seal death that appears to be related to the lobster fishery in Permit Area 1.

(b) *Notification.* Upon receipt of a report of a monk seal death that appears to be related to the lobster fishery, the Regional Administrator will notify all interested parties of the facts known about the incident. The Regional Administrator will also notify them that an investigation is in progress, and that, if the investigation reveals a threat of harm to the monk seal population, protective measures may be implemented.

(c) *Investigation.* (1) The Regional Administrator will investigate the incident reported and will attempt to:

(i) Verify that the incident occurred.

(ii) Determine the extent of the harm to the monk seal population.

(iii) Determine the probability of a similar incident recurring.

(iv) Determine details of the incident such as:

(A) The number of animals involved.

(B) The cause of the mortality.

(C) The age and sex of the dead animal(s).

(D) The relationship of the incident to the reproductive cycle, for example, breeding season (March-September), non-breeding season (October- February).

(E) The population estimates or counts of animals at the island where the incident occurred.

(F) Any other relevant information.

(v) Discover and evaluate any extenuating circumstances.

(vi) Evaluate any other relevant factors.

(2) The Regional Administrator will make the results of the investigation available to the interested parties and request their advice and comments.

(d) *Determination of relationship.* The Regional Administrator will review and evaluate the results of the investigation and any comments received from interested parties. If there is substantial evidence that the death of the monk seal was related to the lobster fishery, the Regional Administrator will:

(1) Advise the interested parties of his or her conclusion and the facts upon which it is based.

(2) Request from the interested parties their advice on the necessity of protective measures and suggestions for appropriate protective measures.

(e) *Determination of response.* The Regional Administrator will consider all relevant information discovered during the investigation or submitted by interested parties in deciding on the appropriate response. Protective measures may include, but are not limited to, changes in trap design, changes in gear, closures of specific areas, or closures for specific periods of time.

(f) *Action by the Regional Administrator.* If the Regional Administrator decides that protective measures are necessary and appropriate, the Regional Administrator will prepare a document that describes the incident, the protective measures proposed, and the reasons for the protective measures; provide it to the interested parties; and request their comments.

(g) *Implementation of protective measures.* (1) If, after completing the steps described in paragraph (f) of this section, the Regional Administrator concludes that protective measures are necessary and appropriate, the Regional Administrator will recommend the protective measures to the Assistant Administrator and provide notice of this recommendation to the Chairman of the Council and the Director of the Division of Aquatic Resources, Department of Land and Natural Resources, State of Hawaii.

(2) If the Assistant Administrator concurs with the Regional Administrator's recommendation, NMFS will publish an action in the Federal Register that includes a description of the incident that triggered the procedure described in this section, the protective measures, and the reasons for the protective measures.

(h) *Notification of "no action."* If, at any point in the process described in this section, the Regional Administrator or Assistant Administrator decides that no further action is required, the interested parties will be notified of this decision.

(i) *Effective dates.* (1) The protective measures will take effect 10 days after the date of publication in the Federal Register.

(2) The protective measures will remain in effect for the shortest of the following time periods:

(i) Until the Crustaceans FMP and this section are amended to respond to the problem;

(ii) Until other action that will respond to the problem is taken under the ESA;

(iii) Until the Assistant Administrator, following the procedures set forth in paragraph (j) of this section, decides that the protective measures are no longer required and repeals the measures; or

(iv) For the period of time set forth in the Federal Register notification, not to exceed 3 months. The measures may be renewed for 3 months after again following procedures in paragraphs (b) through (g) of this section.

(j) *Repeal.* (1) If the Assistant Administrator decides that protective measures may no longer be necessary for the protection of monk seals, the interested parties will be notified of this preliminary decision and the facts upon which it is based. The Assistant Administrator will request advice on the proposed repeal of the protective measures.

(2) The Assistant Administrator will consider all relevant information obtained by the Regional Administrator or submitted by interested parties in deciding whether to repeal the protective measures.

(3) If the Assistant Administrator decides to repeal the protective measures—

(i) Interested parties will be notified of the decision; and

(ii) Notification of repeal and the reasons for the repeal will be published in the Federal Register.

§ 660.52 Monk seal emergency protective measures.

(a) *Determination of emergency.* If, at any time during the process described in §660.51, the Regional Administrator determines that an emergency exists involving monk seal mortality related to the lobster fishery and that measures are needed immediately to protect the monk seal population, the Regional Administrator will—

(1) Notify the interested parties of this determination and request their immediate advice and comments.

(2) Forward a recommendation for emergency action and any advice and comments received from interested parties to the Assistant Administrator.

(b) *Implementation of emergency measures.* If the Assistant Administrator agrees with the recommendation for emergency action—

(1) The Regional Administrator will determine the appropriate emergency protective measures.

(2) NMFS will publish the emergency protective measures in the Federal Register.

(3) The Regional Administrator will notify the interested parties of the emergency protective measures. Holders of permits to fish in Permit Area I will be notified by certified mail. Permit holders that the Regional Administrator knows are on the fishing grounds also will be notified by radio.

(c) *Effective dates.* (1) Emergency protective measures are effective against a permit holder at 12:01 a.m., local time, of the day following the day the permit holder receives actual notice of the measures.

(2) Emergency protective measures are effective for 10 days from the day following the day the first permit holder is notified of the protective measures.

(3) Emergency protective measures may be extended for an additional 10 days, if necessary, to allow the completion of the procedures set out in §660.51.

§ 660.53 Framework procedures.

(a) *Introduction.* New management measures may be added through rulemaking if new information demonstrates that there are biological, social, or economic concerns in Permit Areas 1, 2, or 3. The following framework process authorizes the implementation of measures that may affect the operation of the fisheries, gear, harvest guidelines, or changes in catch and/or effort.

(b) *Annual report.* By June 30 of each year, the Council-appointed Crustaceans Plan Team will prepare an annual report on the fisheries in the management area. The report shall contain, among other things, recommendations for Council action and an assessment of the urgency and effects of such action(s).

(c) *Procedure for established measures.* (1) Established measures are management measures that, at some time, have been included in regulations implementing the FMP, and for which the impacts have been evaluated in Council/NMFS documents in the context of current conditions.

(2) Following the framework procedures of Amendment 9 to the FMP, the Council may recommend to the Regional Administrator that established measures be modified, removed, or re-instituted. Such recommendation shall include supporting rationale and analysis, and shall be made after advance public notice, public discussion, and consideration of public comment. NMFS may implement the Council's recommendation by rulemaking if approved by the Regional Administrator.

(d) *Procedure for New Measures.* (1) New measures are management measures that have not been included in regulations implementing the FMP, or for which the impacts have not been evaluated in Council/NMFS documents in the context of current conditions.

(2) Following the framework procedures of Amendment 9 to the FMP, the Council will publicize, including by a Federal Register document, and solicit public comment on, any proposed new management measure. After a Council meeting at which the measure is discussed, the Council will consider recommendations and prepare a Federal Register document summarizing the Council's deliberations, rationale, and analysis for the preferred action, and the time and place for any subsequent Council meeting(s) to consider the new measure. At subsequent public meeting(s), the Council will consider public comments and other information received to make a recommendation to the Regional Administrator about any new measure. NMFS may implement the Council's recommendation by rulemaking if approved by the Regional Administrator.

§ 660.54 Five-year review.

The Council, in cooperation with NMFS, will conduct a review of the effectiveness and impacts of the NWHI management program, including biological, economic, and social aspects of the fishery, by July 1, 2001.

Subpart E—Bottomfish and Seamount Groundfish Fisheries

§ 660.61 Permits.

(a) *Applicability.* (1) The owner of any vessel used to fish for bottomfish management unit species in the Northwestern Hawaiian Islands Subarea must have a permit issued under this section and the permit must be registered for use with the vessel.

(2) The owner of any vessel used to fish non-commercially for bottomfish management unit species in the Northwestern Hawaiian Islands Subarea must have a permit issued under §660.13 and the permit must be registered for use with the vessel.

(3) The PIRO will not register a single vessel for use with a Ho'omalu Zone permit and a Mau Zone permit at the same time.

(4) Mau Zone permits issued before June 14, 1999 become invalid June 14, 1999, except that a permit issued to a person who submitted a timely application under paragraph (i) of this section is valid until the permit holder either receives a Mau Zone limited entry permit or until final agency action is taken on the permit holder's application. The Ho'omalu Zone and the Mau Zone limited entry systems described in this section are subject to abolition, modification, or additional effort limitation programs.

(b) *Submission.* (1) An application for a permit required under this section must be submitted to the PIRO as described in §660.13. (2) *Ho'omalu Zone limited access permit.* In addition to an application under §660.13(c), each applicant for a Ho'omalu Zone permit must also submit a supplementary information sheet provided by the PIRO, which must be signed by the vessel owner or a designee and include the following information:

(i) The qualification criterion that the applicant believes he or she meets for issuance of a limited access permit;

(ii) A copy of landings receipts or other documentation, with a certification from a state or Federal agency that this information is accurate, to demonstrate participation in the NWHI bottomfish fishery; and

(iii) If the application is filed by a partnership or corporation, the names of each of the individual partners or shareholders and their respective percentages of ownership of the partnership or corporation.

(3) *Mau Zone limited access permit.* The PIRO will not accept applications for a new Mau Zone permit after June 14, 1999. In addition to an application under §660.13(c), each applicant for a Mau Zone permit must also submit a supplementary information sheet provided by the PIRO, which must be signed by the vessel owner or a designee and include the following information:

(i) The qualification criterion that the applicant believes he or she meets for issuance of a limited access permit;

(ii) Copy of State of Hawaii catch report(s) to demonstrate that the permitted vessel had made qualifying landings of bottomfish from the Mau Zone; and

(iii) If the application is filed by a partnership or corporation, the names of each of the individual partners or shareholders and their respective percentage of ownership of the partnership or corporation.

(c) *Sale or transfer of Ho'omalu limited access permits to new vessel owners.* (1) A Ho'omalu zone permit may not be sold or otherwise transferred to a new owner.

(2) A Ho'omalu zone permit or permits may be held by a partnership or corporation. If 50 percent or more of the ownership of the vessel passes to persons other than those listed in the original application, the permit will lapse and must be surrendered to the Regional Administrator.

(d) *Transfer of Ho'omalu Zone limited access permits to replacement vessels.* (1) Upon application by the owner of a permitted vessel, the Regional Administrator will transfer that owner's permit to a replacement vessel owned by that owner, provided that the replacement vessel does not exceed 60 ft (18.3 m) in length. The replacement vessel must be put into service no later than 12 months after the owner applies for the transfer, or the transfer shall be void.

(2) An owner of a permitted vessel may apply to the Regional Administrator for transfer of that owner's permit to a replacement vessel greater than 60 ft (18.3 m) in length. The Regional Administrator may transfer the permit upon determining, after consultation with the Council and considering the objectives of the limited access program, that the replacement vessel has

catching power that is comparable to the rest of the vessels holding permits for the fishery, or has catching power that does not exceed that of the original vessel, and that the transfer is not inconsistent with the objectives of the program. The Regional Administrator shall consider vessel length, range, hold capacity, gear limitations, and other appropriate factors in making determinations of catching power equivalency and comparability of the catching power of vessels in the fishery.

(f) *Issuance of new Ho'omalu Zone limited access permits.* The target number of Ho'omalu Zone permits issued at any one time is 7 permits. If there are less than 7 permits issued, the Regional Administrator will issue new Ho'omalu Zone limited access permits under § 660.13 with eligibility based on the system described in paragraph (g) of this section.

(e) *Ho'omalu Zone limited access permit renewal.* (1) A Ho'omalu Zone permit will be automatically renewed annually and delivered to the mailing address on record of the permit holder, without application and without fee.

(1) *Point system.* (i) Two points will be assigned for each year in which the applicant was owner or captain of a vessel that made three or more of any of the following types of landings in the NWHI:

(A) Any amount of bottomfish management unit species, regardless of weight, if made on or before August 7, 1985;

(B) At least 2,500 lb (1,134 kg) of bottomfish management unit species, if made after August 7, 1985; or

(C) At least 2,500 lb (1,134 kg) of any fish lawfully harvested from the NWHI, of which at least 50 percent by weight was bottomfish, if made after August 7, 1985.

(ii) One point will be assigned for each year in which the applicant was owner or captain of a vessel that landed at least 6,000 lb (2,722 kg) of bottomfish from the main Hawaiian Islands.

(iii) For any one year, points will be assigned under either paragraph (g)(1)(i) or (g)(1)(ii) of this section, but not under both paragraphs.

(iv) Before the Regional Administrator issues an Ho'omalu zone permit to fish for bottomfish under this section, the primary operator and relief operator named on the application form must have completed a protected species workshop conducted by NMFS.

(2) *Restrictions.* An applicant must own at least a 25–percent share in the vessel that the permit would cover, and only one permit will be assigned to any vessel.

(3) *Order of issuance.* New permits shall be awarded to applicants in descending order, starting with the applicant with the largest number of points. If two or more persons have an equal

number of points, and there are insufficient new permits for all such applicants, the new permits shall be awarded by the Regional Administrator through a lottery.

(4) *Notification.* The Regional Administrator shall place a notice in the Federal Register and shall use other means to notify prospective applicants of the opportunity to file applications for new permits under this program.

(h) *Eligibility for new Mau Zone limited access permits.* (1) The PIRO will issue an initial Mau Zone permit to a vessel owner who qualifies for at least three points under the following point system:

(i) An owner who held a Mau Zone permit on or before December 17, 1991, and whose permitted vessel made at least one qualifying landing of bottomfish management unit species on or before December 17, 1991, shall be assigned 1.5 points.

(ii) An owner whose permitted vessel made at least one qualifying landing of bottomfish management unit species during 1991, shall be assigned 0.5 point.

(iii) An owner whose permitted vessel made at least one qualifying landing of bottomfish management unit species during 1992, shall be assigned 1.0 point.

(iv) An owner whose permitted vessel made at least one qualifying landing of bottomfish management unit species during 1993, shall be assigned 1.5 points.

(v) An owner whose permitted vessel made at least one qualifying landing of bottomfish management unit species during 1994, shall be assigned 2.0 points.

(vi) An owner whose permitted vessel made at least one qualifying landing of bottomfish management unit species during 1995, shall be assigned 2.5 points.

(vii) An owner whose permitted vessel made at least one qualifying landing of bottomfish management unit species during 1996, shall be assigned 3.0 points.

(viii) Before the PIRO issues a Mau Zone permit to fish for bottomfish under this section, the primary operator and relief operator named on the application form must have completed a protected species workshop conducted by NMFS.

(2) For purposes of this paragraph §660.61(h), a “qualifying landing” means any amount of bottomfish management unit species lawfully harvested from the Mau Zone and offloaded for sale. No points shall be assigned to an owner for any qualifying landings reported to the State of Hawaii more than 1 year after the landing.

(3) More than one Mau Zone permit may be issued to an owner of two or more vessels, provided each of the owner's vessels for which a permit will be registered for use has made the required qualifying landings for the owner to be assigned at least three eligibility points.

(4) A Mau Zone permit holder who does not own a vessel at the time initial permits are issued must register the permit for use with a vessel owned by the permit holder within 12 months from the date the permit was issued. In the interim, the permit holder may register the permit for use with a leased or chartered vessel. If within 12 months of initial permit issuance, the permit holder fails to apply to the PIRO to register the permit for use with a vessel owned by the permit holder, then the permit expires.

(5) For each of paragraphs (h)(1)(i) through (h)(1)(viii) of this section, the PIRO shall assign points based on the landings of one permitted vessel to only one owner if the vessel did not have multiple owners during the time frame covered by the subordinate paragraphs. If a vessel had multiple owners during a time frame covered by any of paragraphs (h)(1)(i) through (h)(1)(viii) of this section (including joint owners, partners, or shareholders of a corporate owner), the PIRO will assign the points for that subordinate paragraph to a single owner if only one owner submits an application with respect to the landings of that vessel during that time frame. If multiple owners submit separate applications with respect to the same landings of the same vessel during the same time frame, then the PIRO shall:

(i) Adhere to any written agreement between the applicants with respect to who among them shall be assigned the aggregate point(s) generated by landings during such time frame(s), or

(ii) If there is no agreement:

(A) Shall issue the applicants a joint permit provided the vessel's landings during such time frames generated at least three points, or

(B) In the event the vessel's landings during such time frame(s) generated less than three points, shall not assign any points generated by the vessel's landings during such time frame(s).

(i) *Ownership requirements and registration of Mau Zone limited access permits for use with other vessels.* (1) A Mau Zone permit may be held by an individual, partnership, or corporation. No more than 49 percent of the underlying ownership interest in a Mau Zone permit may be sold, leased, chartered, or otherwise transferred to another person or entity. If more than 49 percent of the underlying ownership of the permit passes to persons or entities other than those listed in the original permit application supplemental information sheet, then the permit expires and must be surrendered to the PIRO.

(2) A Mau Zone permit holder may apply under §660.13 to the PIRO to register the permit for use with another vessel if that vessel is owned by the permit holder, and is no longer than 60 ft (18.3 m).

(3) If a Mau Zone permit holder sells the vessel, for which the permit is registered for use, the permit holder must within 12 months of the date of sale apply to the PIRO to register the permit for use with a vessel owned by the permit holder. If the permit holder has not applied to register a replacement vessel within 12 months, then the permit expires.

(4) If a permitted vessel owned by the permit holder is sold or becomes unseaworthy, the Mau Zone permit with which the vessel was registered may be registered for use with a leased or chartered vessel for a period not to exceed 12 months from the date of registration of the leased or chartered vessel. If by the end of that 12-month period the permit holder fails to apply to the PIRO to register the permit for use with a vessel owned by the permit holder, then the permit expires.

(h) *Issuance of new Mau Zone limited access permits.* The target number of Mau Zone permits issued at any one time is 7 permits, with 2 of the 7 permits reserved for qualifying communities under the Western Pacific Community Development Program. If there are less than 7 permits issued, the Regional Administrator will issue new Mau Zone permits under § 660.13 with eligibility based on the system described in paragraphs (X: regular) and (Y:CDPP) of this section.

(i) *Eligibility for new Mau Zone limited access permits.* New Mau Zone permits shall be issued to applicants based upon eligibility, determined as follows:

(1) *Point system.* The following system will be used to rank permit applications and will determine the order of issuance for new Mau Zone permits.

(i) One point will be assigned for each year in which the applicant was owner or captain of a vessel that made qualifying landings of at least 2,500 lb (1,134 kg) of bottomfish management unit species from the main Hawaiian Islands.

(ii) Two points will be assigned for each year in which the applicant was owner or captain of a vessel that made at least five separate fishing trips with qualifying landings of at least 500 lb (227 kg) of bottomfish management unit species from the Northwestern Hawaiian Islands. A maximum of 10 points will be assigned under this paragraph.

(iii) An applicant who has been assigned the maximum number of points under paragraph (i)(1)(ii) of this section will be assigned one point for each year in which he or she was owner or captain of a vessel that made at least five separate trips with qualifying landings of at least 500 lb (227 kg) of bottomfish management unit species each trip from the Northwestern Hawaiian Islands, not including the 5 years for which points were assigned under paragraph (i)(1)(ii) of this section.

(iv) For any one year, points will be assigned under either of the paragraphs (i)(1)(i), (i)(1)(ii), or (i)(1)(iii) of this section.

(2) For the point system described in paragraph (i)(1)(i) of this section, “qualifying landings” means any amount of bottomfish management unit species lawfully harvested from the exclusive economic zone or state waters surrounding the Hawaiian archipelago and offloaded for sale. No points shall be assigned to an owner for any qualifying landings reported to the State of Hawaii more than 1 year after the landing.

(3) More than one Mau Zone permit may be issued to an owner of two or more vessels provided each of the owner's vessels for which a permit will be registered has made the required qualifying landings for the owner to be assigned at least three eligibility points.

(4) For each of paragraphs (i)(1)(i) through (i)(1)(iii) of this section, the Regional Administrator shall assign points based on the landings of one permitted vessel to only one owner if the vessel did not have multiple owners during the time frame for which qualifying landing were made.

(5) If a vessel had multiple owners (including joint owners, partners, or shareholders of a corporate owner), the Regional Administrator will assign points to a single owner if only one owner submits an application with respect to the landings of that vessel for which qualifying landings were made. If multiple owners submit separate applications with respect to the same landings of the same vessel during the same time frame, then the Regional Administrator shall:

(i) Adhere to any written agreement between the applicants with respect to who among them shall be assigned the aggregate point(s) generated by landings during such time frame(s), or

(ii) If there is no agreement:

(A) Shall issue the applicants a joint permit provided the vessel's landings during such time frames generated at least three points, or

(B) In the event the vessel's landings during such time frame(s) generated less than three points, shall not assign any points generated by the vessel's landings during such time frame(s).

(6) *Order of issuance.* New permits shall be awarded to applicants in descending order, starting with the applicant with the largest number of points. If two or more persons have an equal number of points, and there are insufficient new permits for all such applicants, the new permits shall be awarded by the Regional Administrator through a lottery.

(7) *Protected species workshop requirement.* Before the Regional Administrator issues a new Mau Zone permit to fish for bottomfish under this section, the primary operator and relief operator named on the application form must have completed a protected species workshop conducted by NMFS.

(8) *Vessel ownership requirement.* A Mau Zone permit holder who does not own a vessel at the time permits his or her permit is issued must register the permit for use with a vessel owned by the permit holder within 12 months from the date the permit was issued. In the interim, the permit holder may register the permit for use with a leased or chartered vessel. If within 12

months of initial permit issuance, the permit holder fails to apply to the PIRO to register the permit for use with a vessel owned by the permit holder, then the permit expires.

(9) *Notification.* The Regional Administrator shall place a notice in the Federal Register and shall use other means to notify prospective applicants of the opportunity to file applications for new Mau Zone limited access permits as well as Mau Zone Western Pacific Community Development Program limited access permits.

(k) *Mau Zone limited access permit renewal.* (1) A Mau Zone permit will be automatically renewed annually and delivered to the mailing address on record of the permit holder without application and without fee.

(10) *Mau Zone Western Pacific Community Development Program Limited Access Permits.* PIRO shall use the point system and order of issuance as described in paragraphs (i)(1) and (i)(6) of this section, respectively, to award qualifying communities a Mau Zone Western Pacific Community Development Program limited access permit. To apply for a Mau Zone Western Pacific Community Development Program limited access permit, a community must meet the eligibility criteria and requirements set forth in § 660.13(n) of this part.

(k) *Appeals of permit actions.* (1) Except as provided in subpart D of 15 CFR part 904, any applicant for a permit or a permit holder may appeal the granting, denial, or revocation of his or her permit to the Regional Administrator.

(2) In order to be considered by the Regional Administrator, such appeal must be in writing, must state the action appealed, and the reasons therefore, and must be submitted within 30 days of the appealed action. The appellant may request an informal hearing on the appeal.

(3) The Regional Administrator, in consultation with the Council, will decide the appeal in accordance with the FMP and implementing regulations and based upon information relative to the application on file at NMFS and the Council, the summary record kept of any hearing, the hearing officer's recommended decision, if any, and any other relevant information.

(4) If a hearing is requested, or if the Regional Administrator determines that one is appropriate, the Regional Administrator may grant an informal hearing before a hearing officer designated for that purpose. The applicant or permit holder may appear personally or be represented by counsel at the hearing and submit information and present arguments as determined appropriate by the hearing officer. Within 30 days of the last day of the hearing, the hearing officer shall recommend in writing a decision to the Regional Administrator.

(5) The Regional Administrator may adopt the hearing officer's recommended decision, in whole or in part, or may reject or modify it. The Regional Administrator's decision on the application is the final administrative decision of the Department of Commerce, and is effective on the date the Administrator signs the decision.

§ 660.62 Prohibitions.

In addition to the general prohibitions specified in §600.725 of this chapter and §660.15, it is unlawful for any person to do any of the following:

(a) Fish for bottomfish or seamount groundfish using gear prohibited under §660.64.

(b) Fish for, or retain on board a vessel, bottomfish management unit species in the Ho'omalu Zone or Mau Zone without the appropriate permit, registered for use with that vessel, issued under §660.13.

(c) Serve as primary operator or relief operator on a vessel with a Mau or Ho'omalu Zone permit without completing a protected species workshop conducted by NMFS, as required by §660.61.

(d) Fail to notify the USCG at least 24 hours prior to making any landing of bottomfish taken in the Ho'omalu Zone, as required by §660.63.

(e) Fish within any protected species study zone in the NWHI without notifying the Regional Administrator of the intent to fish in these zones, as required under §660.63.

§ 660.63 Notification.

(a) The owner or operator of a fishing vessel subject to this subpart must inform the PIRO at least 72 hours (not including weekends and holidays) before leaving port, of his or her intent to fish within the protected species study zones defined in §660.12. The notice must include the name of the vessel, name of the operator, intended departure and return date, and a telephone number at which the owner or operator may be contacted during the business day (8 a.m. to 5 p.m.) to indicate whether an observer will be required on the subject fishing trip.

(b) The operator of a fishing vessel that has taken bottomfish in the Ho'omalu Zone must contact the USCG, by radio or otherwise, at the 14th District, Honolulu, HI; Pacific Area, San Francisco, CA; or 17th District, Juneau, AK, at least 24 hours before landing, and report the port and the approximate date and time at which the bottomfish will be landed.

§ 660.64 Gear restrictions.

(a) *Bottom trawls and bottom set gillnets.* Any fishing for bottomfish and seamount groundfish with bottom trawls and bottom set gillnets is prohibited.

(b) *Possession of gear.* Possession of a bottom trawl and bottom set gillnet by any vessel having a permit under §660.13 or §660.61 or otherwise established to be fishing for bottomfish or seamount groundfish in the management subareas is prohibited.

(c) *Poisons and explosives.* The possession or use of any poisons, explosives, or intoxicating substances for the purpose of harvesting bottomfish and seamount groundfish is prohibited.

§ 660.65 At-sea observer coverage.

(a) All fishing vessels subject to this subpart must carry an observer when directed to do so by the Regional Administrator.

(b) The PIRO will advise the vessel owner or operator of any observer requirement within 72 hours (not including weekends or holidays) of receipt of the notice. If an observer is required, the owner or operator will be informed of the terms and conditions of observer coverage, and the time and place of embarkation of the observer.

(c) All observers must be provided with sleeping, toilet, and eating accommodations at least equal to that provided to a full crew member. A mattress of futon on the floor or a cot is not acceptable in place of a regular bunk. Meal and other gallery privileges must be the same for the observer as for other crew members.

(d) Female observers on a vessel with an all-male crew must be accommodated either in a single-person cabin or, if reasonable privacy can be ensured by installing a curtain or other temporary divider, in a two-person cabin shared with a licensed officer of the vessel. If the cabin assigned to a female observer does not have its own toilet and shower facilities that can be provided for the exclusive use of the observer, then a schedule for time-sharing of common facilities must be established and approved by the Regional Administrator prior to the vessel's departure from port.

§ 660.66 Protected species conservation.

The Regional Administrator may change the size of the protected species study zones defined in §660.12 of this subpart:

(a) If the Regional Administrator determines that a change in the size of the study zones would not result in fishing for bottomfish in the NWHI that would adversely affect any species listed as threatened or endangered under the ESA.

(b) After consulting with the Council.

(c) Through notification in the Federal Register published at least 30 days prior to the effective date or through actual notice to the permit holders.

§ 660.67 Framework for regulatory adjustments.

(a) *Annual reports.* By June 30 of each year, a Council-appointed bottomfish monitoring team will prepare an annual report on the fishery by area covering the following topics:

(1) Fishery performance data.

(2) Summary of recent research and survey results.

(3) Habitat conditions and recent alterations.

(4) Enforcement activities and problems.

(5) Administrative actions (e.g., data collection and reporting, permits).

(6) State and territorial management actions.

(7) Assessment of need for Council action (including biological, economic, social, enforcement, administrative, and state/Federal needs, problems, and trends). Indications of potential problems warranting further investigation may be signaled by the following indicator criteria:

(i) Mean size of the catch of any species in any area is a pre-reproductive size.

(ii) Ratio of fishing mortality to natural mortality for any species.

(iii) Harvest capacity of the existing fleet and/or annual landings exceed best estimate of MSY in any area.

(iv) Significant decline (50 percent or more) in bottomfish catch per unit of effort from baseline levels.

(v) Substantial decline in ex-vessel revenue relative to baseline levels.

(vi) Significant shift in the relative proportions of gear in any one area.

(vii) Significant change in the frozen/fresh components of the bottomfish catch.

(viii) Entry/exit of fishermen in any area.

(ix) Per-trip costs for bottomfishing exceed per-trip revenues for a significant percentage of trips.

(x) Significant decline or increase in total bottomfish landings in any area.

(xi) Change in species composition of the bottomfish catch in any area.

(xii) Research results.

(xiii) Habitat degradation or environmental problems.

(xiv) Reported interactions between bottomfishing operations and protected species in the NWHI.

(8) Recommendations for Council action.

(9) Estimated impacts of recommended action.

(b) *Recommendation of management action.* (1) The team may present management recommendations to the Council at any time. Recommendations may cover actions suggested for Federal regulations, state/territorial action, enforcement or administrative elements, and research and data collection. Recommendations will include an assessment of urgency and the effects of not taking action.

(2) The Council will evaluate the team's reports and recommendations, and the indicators of concern. The Council will assess the need for one or more of the following types of management action: Catch limits, size limits, closures, effort limitations, access limitations, or other measures.

(3) The Council may recommend management action by either the state/territorial governments or by Federal regulation.

(c) *Federal management action.* (1) If the Council believes that management action should be considered, it will make specific recommendations to the Regional Administrator after requesting and considering the views of its Scientific and Statistical Committee and Bottomfish Advisory Panel and obtaining public comments at a public hearing.

(2) The Regional Administrator will consider the Council's recommendation and accompanying data, and, if he or she concurs with the Council's recommendation, will propose regulations to carry out the action. If the Regional Administrator rejects the Council's proposed action, a written explanation for the denial will be provided to the Council within 2 weeks of the decision.

(3) The Council may appeal denial by writing to the Assistant Administrator, who must respond in writing within 30 days.

(4) The Regional Administrator and the Assistant Administrator will make their decisions in accord with the Magnuson Act, other applicable law, and the Bottomfish FMP.

(5) To minimize conflicts between the Federal and state management systems, the Council will use the procedures in paragraph (b) of this section to respond to state/territorial management actions. Council consideration of action would normally begin with a representative of the state or territorial government bringing a potential or actual management conflict or need to the Council's attention.

(d) *Access limitation procedures.* (1) Access limitation may be adopted under this paragraph (d) only for the NWHI, American Samoa, and Guam.

(2) If access limitation is proposed for adoption or subsequent modification through the process described in this paragraph (d), the following requirements must be met:

(i) The Bottomfish Monitoring Team must consider and report to the Council on present participation in the fishery; historical fishing practices in, and dependence on, the fishery; economics of the fishery; capability of fishing vessels used in the fishery to engage in other fisheries; cultural and social framework relevant to the fishery; and any other relevant considerations.

(ii) Public hearings must be held specifically addressing the limited access proposals.

(iii) A specific advisory subpanel of persons experienced in the fishing industry will be created to advise the Council and the Regional Administrator on administrative decisions.

(iv) The Council's recommendation to the Regional Administrator must be approved by a two-thirds majority of the voting members.

(e) *Five-year review.* The Council will conduct a comprehensive review on the effectiveness of the Mau Zone limited access program 5 years following implementation of the program. The Council will consider the extent to which the FMP objectives have been met and verify that the target number of vessels established for the fishery is appropriate for current fishing activity levels, catch rates, and biological condition of the stocks. The Council may establish a new target number based on the 5-year review.

§ 660.68 Fishing moratorium on Hancock Seamount.

Fishing for bottomfish and seamount groundfish on the Hancock Seamount is prohibited through August 31, 2010.

§ 660.69 Management subareas.

(a) The bottomfish fishery management area is divided into five subareas for the regulation of bottomfish and seamount groundfish fishing with the following designations and boundaries:

(1) Main Hawaiian Islands means the EEZ of the Hawaiian Islands Archipelago lying to the east of 161°20' W. long.

(2) Northwestern Hawaiian Islands (NWHI) means the EEZ of the Hawaiian Islands Archipelago lying to the west of 161°20' W. long. However, for the purposes of regulations issued under this subpart, Midway Island is treated as part of the Northwestern Hawaiian Islands Subarea.

(i) Ho'omalu Zone means that portion of the EEZ around the NWHI west of 165° W. long.

(ii) Mau Zone means that portion of the EEZ around the NWHI between 161°20' W. long. and 165° W. long.

(3) Hancock Seamount means that portion of the EEZ in the Northwestern Hawaiian Islands west of 180°00' W. long. and north of 28°00' N. lat.

(4) Guam means the EEZ seaward of the Territory of Guam.

(5) American Samoa means the EEZ seaward of the Territory of American Samoa.

(b) The inner boundary of the fishery management area is a line coterminous with the seaward boundaries of the State of Hawaii, the Territory of American Samoa, and the Territory of Guam (the “3 mile-limit”).

(c) The outer boundary of the fishery management area is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured, or is coterminous with adjacent international maritime boundaries. The outer boundary of the fishery management area north of Guam will extend to those points which are equidistant between Guam and the island of Rota in the Commonwealth of the Northern Mariana Islands.

Subpart F—Precious Corals Fisheries

§ 660.81 Permits.

(a) Any vessel of the United States fishing for, taking, or retaining precious coral in any precious coral permit area must have a permit issued under §660.13.

(b) Each permit will be valid for fishing only in the permit area specified on the permit. Precious Coral Permit Areas are defined in §660.12.

(c) No more than one permit will be valid for any one vessel at any one time.

(d) No more than one permit will be valid for any one person at any one time.

(e) The holder of a valid permit to fish one permit area may obtain a permit to fish another permit area only upon surrendering to the Regional Administrator any current permit for the precious corals fishery issued under §660.13.

(f) General requirements governing application information, issuance, fees, expiration, replacement, transfer, alteration, display, sanctions, and appeals for permits for the precious corals fishery are contained in §660.13.

§ 660.82 Prohibitions.

In addition to the general prohibitions specified in §600.725 of this chapter and in §660.15, it is unlawful for any person to:

(a) Fish for, take, or retain any precious coral management unit species in any area shoreward of the outer boundary of the NWHI National Marine Sanctuary

(a) Use any vessel to fish for, take, retain, possess or land precious coral in any precious coral permit area, unless a permit has been issued for that vessel and area as specified in §660.13 and that permit is on board the vessel.

(b) Fish for, take, or retain any species of precious coral in any precious coral permit area:

(1) By means of gear or methods prohibited by §660.88.

(2) In refugia specified in §660.12.

(3) In a bed for which the quota specified in §660.84 has been attained.

(4) In violation of any permit issued under §660.13 or §660.17.

(c) Take and retain, possess, or land any live pink coral or live black coral from any precious coral permit area that is less than the minimum height specified in §660.86 unless:

(1) A valid EFP was issued under §660.17 for the vessel and the vessel was operating under the terms of the permit; or

(2) The coral originated outside coral beds listed in this paragraph, and this can be demonstrated through receipts of purchase, invoices, or other documentation.

§ 660.83 Seasons.

The fishing year for precious coral begins on July 1 and ends on June 30 the following year, except at the Makapuu Bed, which has a 2-year fishing period that begins July 1 and ends June 30, 2 years later.

§ 660.84 Quotas.

(a) *General.* The quotas limiting the amount of precious coral that may be taken in any precious coral permit area during the fishing year are listed in Table 1 of this part. Only live coral is counted toward the quota. The accounting period for all quotas begins July 1, 1983.

(b) *Conditional bed closure.* A conditional bed will be closed to all nonselective coral harvesting after the quota for one species of coral has been taken.

(c) *Reserves and reserve release.* The quotas for exploratory areas will be held in reserve for harvest by vessels of the United States in the following manner:

(1) At the start of the fishing year, the reserve for each of the three exploratory areas will equal the quota minus the estimated domestic annual harvest for that year.

(2) As soon as practicable after December 31 each year, the Regional Administrator will determine the amount harvested by vessels of the United States between July 1 and December 31 of that year.

(3) NMFS will release to TALFF an amount of precious coral for each exploratory area equal to the quota minus two times the amount harvested by vessels of the United States in that July 1 through December 31 period.

(4) NMFS will publish in the Federal Register a notification of the Regional Administrator's determination and a summary of the information on which it is based as soon as practicable after the determination is made.

§ 660.85 Closures.

(a) If the Regional Administrator determines that the harvest quota for any coral bed will be reached prior to the end of the fishing year, or the end of the 2-year fishing period at Makapuu Bed, NMFS will issue a field order closing the bed involved by publication of an action in the Federal Register, and through appropriate news media. Any such field order must indicate the reason for the closure, the bed being closed, and the effective date of the closure.

(b) A closure is also effective for a permit holder upon the permit holder's actual harvest of the applicable quota.

§ 660.86 Size restrictions.

The height of a live coral specimen shall be determined by a straight line measurement taken from its base to its most distal extremity. The stem diameter of a living coral specimen shall be determined by measuring the greatest diameter of the stem at a point no less than 1 inch (2.54 cm) from the top surface of the living holdfast.

(a) Live pink coral harvested from any precious coral permit area must have attained a minimum height of 10 inches (25.4 cm).

(b) *Black coral.* (1) Except as provided in paragraph (b)(2) of this section, live black coral harvested from any precious coral permit area must have attained either a minimum stem diameter of 1 inch (2.54 cm), or a minimum height of 48 inches (122 cm).

(2) The NMFS PIRO will issue an exemption permitting hand-harvesting of live black coral that has attained a minimum base diameter of 3/4 inches (1.91 cm), measured on the widest portion of the skeleton at a location just above the holdfast, to any person who reported a landing of black coral to the State of Hawaii within 5 years before April 17, 2002.

§ 660.87 Area restrictions.

Fishing for coral on the WestPac Bed is not allowed. The specific area closed to fishing is all waters within a 2-nm radius of the midpoint of 23°18.0' N. lat., 162°35.0' W. long.

§ 660.88 Gear restrictions.

Only selective gear may be used to harvest coral from any precious coral permit area.

§ 660.89 Framework procedures.

(a) *Introduction.* Established management measures may be revised and new management measures may be established and/or revised through rulemaking if new information demonstrates that there are biological, social, or economic concerns in a precious coral permit area. The following framework process authorizes the implementation of measures that may affect the operation of the fisheries, gear, quotas, season, or levels of catch and/or in effort.

(b) *Annual report.* By June 30 of each year, the Council-appointed Precious Coral Team will prepare an annual report on the fisheries in the management area. The report will contain, among other things, recommendations for Council action and an assessment of the urgency and effects of such action(s).

(c) *Procedure for established measures.* (1) Established measures are management measures that, at some time, have been included in regulations implementing the FMP, and for which the impacts have been evaluated in Council/NMFS documents in the context of current conditions.

(2) According to the framework procedures of Amendment 3 to the FMP, the Council may recommend to the Regional Administrator that established measures be modified, removed, or re-instituted. Such recommendation will include supporting rationale and analysis and will be made after advance public notice, public discussion, and consideration of public comment. NMFS may implement the Council's recommendation by rulemaking if approved by the Regional Administrator.

(d) *Procedure for new measures.* (1) New measures are management measures that have not been included in regulations implementing the FMP, or for which the impacts have not been evaluated in Council/NMFS documents in the context of current conditions.

(2) Following the framework procedures of Amendment 3 to the FMP, the Council will publicize, including by a Federal Register document, and solicit public comment on, any proposed new management measure. After a Council meeting at which the measure is discussed, the Council will consider recommendations and prepare a Federal Register document summarizing the Council's deliberations, rationale, and analysis for the preferred action and the time and place for any subsequent Council meeting(s) to consider the new measure. At a subsequent public meeting, the Council will consider public comments and other information received before making a recommendation to the Regional Administrator about any new measure. If approved by the Regional Administrator, NMFS may implement the Council's recommendation by rulemaking.

Subpart J—Western Pacific Coral Reef Ecosystem Fisheries

§ 660.601 Relation to other laws.

To ensure consistency between the management regimes of different Federal agencies with shared management responsibilities of fishery resources within the Coral reef ecosystem regulatory area, fishing authorized under this subpart is not allowed within the boundary of a National Wildlife Refuge unless specifically authorized by the USFWS, regardless of whether that refuge was established by action of the President or the Secretary of the Interior.

§ 660.602 Permits and fees.

(a) *Applicability.* Unless otherwise specified in this subpart, §660.13 applies to coral reef ecosystem permits.

(1) *Special permit.* Any person of the United States fishing for, taking or retaining coral reef ecosystem MUS must have a special permit if they, or a vessel which they operate, is used to fish for any:

(i) Coral reef ecosystem MUS in low-use MPAs as defined in §660.18;

(ii) Potentially Harvested Coral Reef Taxa in the coral reef ecosystem regulatory area; or

(iii) Coral reef ecosystem MUS in the coral reef ecosystem regulatory area with any gear not specifically allowed in this subpart.

(2) *Transshipment permit.* A receiving vessel must be registered for use with a transshipment permit if that vessel is used in the coral reef ecosystem regulatory area to land or tranship PHCRT, or any coral reef ecosystem MUS harvested within low-use MPAs.

(3) *Exceptions.* The following persons are not required to have a permit under this section:

(i) Any person issued a permit to fish under the Bottomfish and Seamount Groundfish FMP, Pelagics FMP, Crustaceans FMP or Precious Corals FMP who incidentally catches coral reef ecosystem MUS while fishing for bottomfish management unit species, crustaceans management unit species, Pacific pelagic management unit species, precious coral, or seamount groundfish.

(ii) Any person fishing for CHCRT outside of an MPA, who does not retain any incidentally caught PHCRT; and

(iii) Any person collecting marine organisms for scientific research as described in §600.745 of this chapter.

(b) *Validity.* Each permit will be valid for fishing only in the fishery management subarea specified on the permit.

(c) *General requirements.* General requirements governing application information, issuance, fees, expiration, replacement, transfer, alteration, display, sanctions, and appeals for permits are contained in §660.13.

(d) *Special permit.* The Regional Administrator shall issue a special permit in accordance with the criteria and procedures specified in this section.

(1) *Application.* An applicant for a special or transshipment permit issued under this section must complete and submit to the Regional Administrator, a Special Coral Reef Ecosystem Fishing Permit Application Form issued by NMFS. Information in the application form must include, but is not limited to a statement describing the objectives of the fishing activity for which a special permit is needed, including a general description of the expected disposition of the resources harvested under the permit (*i.e.,* stored live, fresh, frozen, preserved; sold for food, ornamental, research, or other use, and a description of the planned fishing operation, including location of fishing and gear operation, amount and species (directed and incidental) expected to be harvested and estimated habitat and protected species impacts).

(2) *Incomplete applications.* The Regional Administrator may request from an applicant additional information necessary to make the determinations required under this section. An applicant will be notified of an incomplete application within 10 working days of receipt of the application. An incomplete application will not be considered until corrected in writing.

(3) *Issuance.* (i) If an application contains all of the required information, the Regional Administrator will forward copies of the application within 30 days to the Council, the U.S. Coast Guard, the fishery management agency of the affected state, and other interested parties who have identified themselves to the Council, and the USFWS.

(ii) Within 60 days following receipt of a complete application, the Regional Administrator will consult with the Council through its Executive Director, USFWS, and the Director of the affected state fishery management agency concerning the permit application and will receive their recommendations for approval or disapproval of the application based on:

(A) Information provided by the applicant,

(B) The current domestic annual harvesting and processing capacity of the directed and incidental species for which a special permit is being requested,

(C) The current status of resources to be harvested in relation to the overfishing definition in the FMP,

(D) Estimated ecosystem, habitat, and protected species impacts of the proposed activity, and

(E) Other biological and ecological information relevant to the proposal. The applicant will be provided with an opportunity to appear in support of the application.

(iii) Following a review of the Council's recommendation and supporting rationale, the Regional Administrator may:

(A) Concur with the Council's recommendation and, after finding that it is consistent with the goals and objectives of the FMP, the national standards, the Endangered Species Act, and other applicable laws, approve or deny a special permit; or

(B) Reject the Council's recommendation, in which case, written reasons will be provided by the Regional Administrator to the Council for the rejection.

(iv) If the Regional Administrator does not receive a recommendation from the Council within 60 days of Council receipt of the permit application, the Regional Administrator can make a determination of approval or denial independently.

(v) Within 30 working days after the consultation in paragraph (d)(3)(ii) of this section, or as soon as practicable thereafter, NMFS will notify the applicant in writing of the decision to grant or deny the special permit and, if denied, the reasons for the denial. Grounds for denial of a special permit include the following:

(A) The applicant has failed to disclose material information required, or has made false statements as to any material fact, in connection with his or her application.

(B) According to the best scientific information available, the directed or incidental catch in the season or location specified under the permit would detrimentally affect any coral reef resource or coral reef ecosystem in a significant way, including, but not limited to issues related to, spawning grounds or seasons, protected species interactions, EFH, and habitat areas of particular concern (HAPC).

(C) Issuance of the special permit would inequitably allocate fishing privileges among domestic fishermen or would have economic allocation as its sole purpose.

(D) The method or amount of harvest in the season and/or location stated on the permit is considered inappropriate based on previous human or natural impacts in the given area.

(E) NMFS has determined that the maximum number of permits for a given area in a given season has been reached and allocating additional permits in the same area would be detrimental to the resource.

(F) The activity proposed under the special permit would create a significant enforcement problem.

(vi) The Regional Administrator may attach conditions to the special permit, if it is granted, consistent with the management objectives of the FMP, including but not limited to:

(A) The maximum amount of each resource that can be harvested and landed during the term of the special permit, including trip limits, where appropriate.

(B) The times and places where fishing may be conducted.

(C) The type, size, and amount of gear which may be used by each vessel operated under the special permit.

(D) Data reporting requirements.

(E) Such other conditions as may be necessary to ensure compliance with the purposes of the special permit consistent with the objectives of the FMP.

(4) *Appeals of permit actions.* (i) Except as provided in subpart D of 15 CFR part 904, any applicant for a permit or a permit holder may appeal the granting, denial, conditioning, or suspension of their permit or a permit affecting their interests to the Regional Administrator. In order to be considered by the Regional Administrator, such appeal must be in writing, must state the action(s) appealed, and the reasons therefore, and must be submitted within 30 days of the original action(s) by the Regional Administrator. The appellant may request an informal hearing on the appeal.

(ii) Upon receipt of an appeal authorized by this section, the Regional Administrator will notify the permit applicant, or permit holder as appropriate, and will request such additional information and in such form as will allow action upon the appeal. Upon receipt of sufficient information, the Regional Administrator will rule on the appeal in accordance with the permit eligibility criteria set forth in this section and the FMP, as appropriate, based upon information relative to the application on file at NMFS and the Council and any additional information, the summary record kept of any hearing and the hearing officer's recommended decision, if any, and such other considerations as deemed appropriate. The Regional Administrator will notify all interested persons of the decision, and the reasons therefor, in writing, normally within 30 days of the receipt of sufficient information, unless additional time is needed for a hearing.

(iii) If a hearing is requested, or if the Regional Administrator determines that one is appropriate, the Regional Administrator may grant an informal hearing before a hearing officer designated for that purpose after first giving notice of the time, place, and subject matter of the hearing in the Federal Register. Such a hearing shall normally be held no later than 30 days following publication of the notice in the Federal Register, unless the hearing officer extends the time for reasons deemed equitable. The appellant, the applicant (if different), and, at the discretion of the hearing officer, other interested parties, may appear personally or be represented by counsel at the hearing and submit information and present arguments as determined appropriate by the hearing officer. Within 30 days of the last day of the hearing, the hearing officer shall recommend in writing a decision to the Regional Administrator.

(iv) The Regional Administrator may adopt the hearing officer's recommended decision, in whole or in part, or may reject or modify it. In any event, the Regional Administrator will notify interested persons of the decision, and the reason(s) therefore, in writing, within 30 days of receipt of the hearing officer's recommended decision. The Regional Administrator's action constitutes final action for the agency for the purposes of the Administrative Procedure Act.

(5) Any time limit prescribed in this section may be extended for good cause, for a period not to exceed 30 days by the Regional Administrator, either upon his or her own motion or upon written request from the Council, appellant or applicant stating the reason(s) therefore.

§ 660.603 Prohibitions.

In addition to the general prohibitions specified in §600.725 of this chapter and §660.15 of this part, it is unlawful for any person to do any of the following:

(a) Fish for, take, or retain any coral reef ecosystem management unit species in any area shoreward of the outer boundary of the NWHI National Marine Sanctuary

(a) Fish for, take, retain, possess or land any coral reef ecosystem MUS in any low-use MPA as defined in §660.18(c)(1) and (c)(2) unless:

(1) A valid permit has been issued for the hand harvester or the fishing vessel operator that specifies the applicable area of harvest;

(2) A permit is not required, as outlined in §600.602 of this chapter;

(3) The coral reef ecosystem MUS possessed on board the vessel originated outside the regulatory area and this can be demonstrated through receipts of purchase, invoices, fishing logbooks or other documentation.

(b) Fish for, take, or retain any coral reef ecosystem MUS species:

(1) That is determined overfished with subsequent rulemaking by the Regional Administrator.

(2) By means of gear or methods prohibited under §660.604.

(3) In a low-use MPA without a valid special permit.

(4) In violation of any permit issued under §660.13 or §660.601.

(c) Fish for, take, or retain any wild live rock or live hard coral except under a valid special permit for scientific research, aquaculture seed stock collection or traditional and ceremonial purposes by indigenous people.

§ 660.604 Notifications.

Any special permit holder subject to the requirements of this subpart must contact the appropriate NMFS enforcement agent in American Samoa, Guam, or Hawaii at least 24 hours before landing any coral reef ecosystem MUS unit species harvested under a special permit, and report the port and the approximate date and time at which the catch will be landed.

§ 660.605 Allowable gear and gear restrictions.

(a) Coral reef ecosystem MUS may be taken only with the following allowable gear and methods:

(1) Hand harvest;

(2) Spear;

(3) Slurp gun;

(4) Hand net/dip net;

(5) Hoop net for Kona crab;

(6) Throw net;

(7) Barrier net;

(8) Surround/purse net that is attended at all times;

(9) Hook-and-line (includes handline (powered or not)), rod-and-reel, and trolling);

(10) Crab and fish traps with vessel ID number affixed; and

(11) Remote-operating vehicles/submersibles.

(b) Coral reef ecosystem MUS may not be taken by means of poisons, explosives, or intoxicating substances. Possession or use of these materials by any permit holder under this subpart who is established to be fishing for coral reef ecosystem MUS in the regulatory area is prohibited.

(c) Coral reef ecosystem MUS may not be taken by means of spearfishing with SCUBA at night (from 6 p.m. to 6 a.m.) in the U.S. EEZ waters around Howland Island, Baker Island, Jarvis Island, Wake Island, Kingman Reef, Johnston Atoll and Palmyra Atoll.

(d) Existing FMP fisheries shall follow the allowable gear and methods outlined in their respective plans.

(e) Any person who intends to fish with new gear not included in §660.604 must describe the new gear and its method of deployment in the special permit application. A decision on the permissibility of this gear type will be made by the Regional Administrator after consultation with the Council and the director of the affected state fishery management agency.

§ 660.606 Gear identification.

(a) The vessel number must be affixed to all fish and crab traps on board the vessel or deployed in the water by any vessel or person holding a permit under §660.13 or §660.601 or that is otherwise established to be fishing for coral reef ecosystem MUS in the regulatory area.

(b) *Enforcement action.* (1) Traps not marked in compliance with paragraph (a) of this section and found deployed in the coral reef ecosystem regulatory area will be considered unclaimed or abandoned property, and may be disposed of in any manner considered appropriate by NMFS or an authorized officer;

(2) Unattended surround nets or bait seine nets found deployed in the coral reef ecosystem regulatory area will be considered unclaimed or abandoned property, and may be disposed of in any manner considered appropriate by NMFS or an authorized officer.

§ 660.607 Framework for regulatory adjustments.

(a) *Procedure for established measures.* (1) Established measures are management measures that, at some time, have been included in regulations implementing the FMP, or for which the impacts have been evaluated in Council/NMFS documents in the context of current conditions;

(2) Following framework procedures of the CREFMP, the Council may recommend to the Regional Administrator that established measures be modified, removed, or re-instituted. Such recommendation shall include supporting rationale and analysis, and shall be made after advance public notice, public discussion and consideration of public comment. NMFS may implement the Council's recommendation by rulemaking if approved by the Regional Administrator.

(b) *Procedure for new measures.* (1) New measures are management measures that have not been included in regulations implementing the FMP, or for which the impacts have not been evaluated in Council/NMFS documents in the context of current conditions. New measures include but are not limited to catch limits, resource size limits, closures, effort limitations, reporting and recordkeeping requirements;

(2) Following the framework procedures of the FMP, the Regional Administrator will publicize, including by Federal Register notice, and solicit public comment on, any proposed new management measure. After a Council meeting at which the measure is discussed, the Council will consider recommendations and prepare a document summarizing the Council's deliberations, rationale, and analysis for the preferred action, and the time and place for any subsequent Council meeting(s) to consider the new measure. At subsequent public meeting(s), the Council will consider public comments and other information received to make a recommendation to the Regional Administrator about any new measure. NMFS may implement the Council's recommendation by rule making if approved by the Regional Administrator.

(i) The Regional Administrator will consider the Council's recommendation and supporting rationale and analysis, and, if the Regional Administrator concurs with the Council's recommendation, will propose regulations to carry out the action. If the Regional Administrator rejects the Council's proposed action, the Regional Administrator will provide a written explanation for the denial within 2 weeks of the decision.

(ii) The Council may appeal denial by writing to the Assistant Administrator, who must respond in writing within 30 days.

(iii) The Regional Administrator and the Assistant Administrator will make their decisions in accordance with the Magnuson-Stevens Act, other applicable laws, and the CREFMP.

(iv) To minimize conflicts between the Federal and state/territorial/commonwealth management systems, the Council will use the procedures in paragraph (a)(2) in this section to respond to state/territorial/commonwealth management actions. The Council's consideration of action would normally begin with a representative of the state, territorial or commonwealth government bringing a potential or actual management conflict or need to the Council's attention.

§ 660.608 Regulatory area.

(a) The regulations in this subpart govern fishing for coral reef ecosystem management unit species by vessels of the United States or persons who operate or are based inside the outer boundary of the U.S. EEZ off:

(1) The Hawaiian Islands Archipelago.

(2) Guam.

(3) American Samoa.

(4) Offshore area of the CNMI or that portion of the U.S. EEZ around the CNMI between three nautical miles offshore and the outer boundary of the U.S. EEZ.

(5) Baker Island, Howland Island, Jarvis Island, Wake Island, Johnston Atoll, Palmyra Atoll and Kingman Reef.

(b) The inner boundary of the regulatory area is as follows:

(1) The shoreline of Baker Island, Howland Island, Jarvis Island, Wake Island, Johnston Atoll, Palmyra Atoll and Kingman Reef.

(2) The seaward boundaries of the State of Hawaii, the Territory of Guam, the Territory of American Samoa; and

(3) A line three nautical miles seaward from the shoreline of the CNMI.

(c) The outer boundary of the regulatory area is the outer boundary of the U.S. EEZ or adjacent international maritime boundaries. The CNMI and Guam regulatory area is divided by a line intersecting these two points: 148° E. long., 12° N. lat., and 142° E. long., 16° N. lat.

§ 660.609 Annual reports

(a) *Annual reports.* By July 31 of each year, a Council-appointed coral reef ecosystem plan team will prepare an annual report on coral reef fisheries of the western Pacific region. The report will contain, among other things, fishery performance data, summaries of new information and assessments of need for Council action.

(b) *Recommendation for Council action.* (1) The Council will evaluate the annual report and advisory body recommendations and may recommend management action by either the state/territorial/commonwealth governments or by Federal regulation;

(2) If the Council believes that management action should be considered, it will make specific recommendations to the Regional Administrator after considering the views of its advisory bodies.

Table 1 to Part 660—Quotas for Precious Corals Permit Areas

Name of coral bed	Type of bed	Harvest quota	Number of years
Makapu'u	Established	P_2,000 kg	2
	....	G_Zero (0 kg)	n/a
	....	B_500 kg	2
Ke-ahole Point	Conditional	P_67 kg	1
	....	G_20 kg	1
	....	B_17 kg	1
Kaena Point	Conditional	P_67 kg	1
	....	G_20 kg	1
	....	B_17 kg	1
Brooks Bank	Conditional	P_17 kg	1
	....	G_133 kg	1
	....	B_111 kg	1
180 Fathom Bank	Conditional	P_222 kg	1
	....	G_67 kg	1
	....	B_56 kg	1
Westpac Bed	Refugium	Zero (0 kg)	n/a
Hawaii, American, Samoa, Guam, U.S. Pacific Island possessions.	Exploratory	X_1,000 kg (all species combined except black corals) per area	1

Notes:
1. Types of corals: P = Pink G = Gold B = Bamboo
2. No authorized fishing for coral in refugia

Table 3 to Part 660—Currently Harvested Coral Reef Taxa

Family name	Common name (scientific name)
Acanthuridae (Surgeonfishes)...........	Orange-spot surgeonfish (Acanthurus olivaceus) Yellowfin surgeonfish (Acanthurus xanthopterus) Convict tang (Acanthurus triostegus) Eye-striped surgeonfish (Acanthurus dussumieri) Blue-lined surgeon (Acanthurus nigroris) Whitebar surgeonfish (Acanthurus leucopareius) Blue-banded surgeonfish

	(Acanthurus lineatus) Blackstreak surgeonfish (Acanthurus nigricauda) Whitecheek surgeonfish (Acanthurus nigricans) White-spotted surgeonfish (Acanthurus guttatus) Ringtail surgeonfish (Acanthurus blochii) Brown surgeonfish (Acanthurus nigrofuscus) Elongate surgeonfish (Acanthurus mata) Mimic surgeonfish (Acanthurus pyroferus) Yellow-eyed surgeonfish (Ctenochaetus strigousus) Striped bristletooth (Ctenochaetus striatus) Twospot bristletooth (Ctenochaetus binotatus Bluespine unicornfish (Naso unicornus) Orangespine unicornfish (Naso lituratus) Humpnose unicornfish (Naso tuberosus) Black tongue unicornfish (Naso hexacanthus) Bignose unicornfish (Naso vlamingii) Whitemargin unicornfish (Naso annulatus) Spotted unicornfish (Naso brevirostris) Humpback unicornfish (Naso brachycentron) Barred unicornfish (Naso thynnoides) Gray unicornfish (Naso caesius)
Balistidae (Triggerfishes)............	Titan triggerfish (Balistoides viridescens) Clown triggerfish (Balistoides conspicillum) Orangstriped triggerfish (Balistapus undulatus) Pinktail triggerfish (Melichthys vidua) Black triggerfish (Melichtys niger) Blue Triggerfish (Pseudobalistesfucus fucus) Picassofish (Rhinecanthus aculeatus)

	Wedged Picassofish (Balistoides rectangulus) Bridled triggerfish (Sufflamen fraenatus)
Carangidae (Jacks)	Bigeye scad (Selar crumenophthalmus) Mackerel scad (Decapterus macarellus)
Carcharhinidae (Sharks)	Grey reef shark (Carcharhinus amblyrhynchos) Silvertip shark (Carcharhinus albimarginatus) Galapagos shark (Carcharhinus galapagenis) Blacktip reef shark (Carcharhinus melanopterus) Whitetip reef shark (Triaenodon obesus)
Holocentridae (Soldierfish/ Squirrelfish).	Bigscale soldierfish (Myripristis berndti) Bronze soldierfish (Myripristis adusta) Blotcheye soldierfish (Myripristis murdjan) Brick soldierfish (Myripristis amaena) Scarlet soldierfish (Myripristis pralinia) Violet soldierfish (Myripristis violacea) Whitetip soldierfish (Myripristis vittata) Yellowfin soldierfish (Myripristis chryseres) Pearly soldierfish (Myripristis kuntee) Double tooth squirrel fish (Myripristis hexagona) Tailspot squirrelfish (Sargocentron caudimaculatum) Blackspot squirrelfish (Sargocentron melanospilos) File-lined squirrelfish (Sargocentron microstoma) Pink squirrelfish (Sargocentron tieroides) Crown squirrelfish (Sargocentron diadema) Peppered squirrelfish (Sargocentron punctatissimum) Blue-lined squirrelfish (Sargocentron tiere) Hawaiian squirrelfish (Sargocentron xantherythrum)

	Squirrelfish (Sargocentron furcatum)
	Saber or Long jaw squirrelfish (Sargocentron spiniferum)
	Spotfin squirrelfish (Neoniphon spp.)
Kuhliidae (Flag-tails).................	Hawaiian flag-tail (Kuhlia sandvicensis)
	Barred flag-tail (Kuhlia mugil)
Kyphosidae Rudderfish..................	Rudderfish (Kyphosus biggibus)
	Rudderfish (Kyphosus cinerascens)
	Rudderfish (Kyphosus vaigienses)
Labridae (Wrasses).....................	Saddleback hogfish (Bodianus bilunulatus)
	Napoleon wrasse (Cheilinus undulatus)
	Triple-tail wrasse (Cheilinus trilobatus)
	Floral wrasse (Cheilinus chlorourus)
	Harlequin tuskfish (Cheilinus fasciatus)
	Ring-tailed wrasse (Oxycheilinus unifasciatus)
	Bandcheek wrasse (Oxycheilinus diagrammus)
	Arenatus wrasse (Oxycheilinus arenatus)
	Razor wrasse (Xyricthys pavo)
	Whitepatch wrasse (Xyrichtes aneitensis)
	Cigar wrasse (Cheilio inermis)
	Blackeye thicklip (Hemigymnus melapterus)
	Barred thicklip (Hemigymnus fasciatus)
	Three-spot wrasse (Halichoeres trimaculatus)
	Checkerboard wrasse (Halichoeres hortulanus)
	Weedy surge wrasse (Halichoeres margaritacous)
	Goldstripe wrasse(Halichoeres zeylonicus)
	Surge wrasse (Thalassoma purpureum)
	Red ribbon wrasse (Thalassoma quinquevittatum)
	Sunset wrasse (Thalassoma lutescens)
	Longface wrasse (Hologynmosus doliatus)

	Rockmover wrasse (Novaculichthys taeniourus)
Mullidae (Goatfishes)..................	Yellow goatfish (Mulloidichthys spp.)
	Orange goatfish (Mulloidichthys pfleugeri)
	Yellowfin goatfish (Mulloidichthys vanicolensis)
	Yellowstripe goatfish (Mulloidichthys flaviolineatus)
	Banded goatfish (Parupeneus spp.)
	Dash-dot goatfish (Parupeneus barberinus)
	Doublebar goatfish (Parupeneus bifasciatus)
	Redspot goatfish (Parupeneus heptacanthus)
	White-lined goatfish (Parupeneus ciliatus)
	Yellowsaddle goatfish (Parupeneus cyclostomas)
	Side-spot goatfish (Parupeneus pleurostigma)
	Indian goatfish (Parupeneus indicus)
	Multi-barred goatfish (Parupeneus multifaciatus)
	Bantail goatfish (Upeneus arge)
Mugilidae (Mullets)....................	Stripped mullet (Mugil cephalus)
	Engel's mullet (Moolgarda engeli)
	False mullet (Neomyxus leuciscus)
	Fringelip mullet (Crenimugil crenilabis)
Muraenidae (Moray ells)................	Yellowmargin moray eel (Gymnothorax flavimarginatus)
	Giant moray eel (Gymnothorax javanicus)
	Undulated moray eel (Gymnothorax undulatus)
Octopodidae............................	Octopus (Octopus cyanea; Octopus ornatus)
Polynemidae............................	Threadfin (Polydactylus sexfilis)
Pricanthidae (Bigeye)..................	Glasseye (Heteropriacanthus cruentatus)
	Bigeye (Priacanthus hamrur)
Scaridae (Parrotfishes)................	Humphead parrotfish (Bulbometapon muracatum)
	Parrotfish (Scarus spp.)

	Pacific longnose parrotfish (Hipposcarus longiceps)
	Stareye parrotfish (Catolomus carolinus)
Scombridae............................	Dogtooth tuna (Gymnosarda unicolor)
Siganidae (Rabbitfish)................	Forktail rabbitfish (Siganus aregentus)
	Golden rabbitfish (Siganus guttatus)
	Gold-spot rabbitfish (Siganus punctatissimus)
	Randall's rabbitfish (Siganus randalli)
	Scribbled rabbitfish (Siganus spinus)
	Vermiculate rabbitfish (Siganus vermiculatus)
Sphyraenidae (Barracuda)...............	Heller's barracuda (Sphyraena helleri)
	Great Barracuda (Sphyraena barracuda)
Turbinidae (turban shells/green snails)	Green snails (Turbo spp.)
Aquarium Taxa/Species..................	Acanthuridae
	Yellow tang (Zebrasoma flavescens)
	Yellow-eyed surgeon fish (Ctenochaetus strigosus)
	Achilles tang (Acanthurus achilles)
	Muraenidae
	Dragon eel (Enchelycore pardalis)
	Zanclidae
	Morrish idol (Zanclus cornutus)
	Pomacanthidae
	Angelfish (Centropyge shepardi, Centropyge flavissimus)
	Cirrhitidae
	Flame hawkfish (Neocirrhitus armatus)
	Chaetodontidae
	Butterflyfish (Chaetodon auriga, Chaetodon lunula, Chaetodon melannotus, Chaetodon ephippium)
	Pomacentridae
	Damselfish (Chromis viridis, Dascyllus aruanus, Dascyllus trimaculatus)
	Sabellidae
	Featherduster worm

Table 4 to Part 660—Potentially Harvested Coral Reef Taxa

Labridae spp. (wrasses) (Those species not listed in Table 3).	Ephippidae (batfish)
Carcharhinidae spp. Sphyrnidae spp. (Those species not listed in Table 3).	Monodactylidae (monos)
Dasyatididae, Myliobatidae, Mobulidae (rays).	Haemulidae (sweetlips)
Serranidae spp. (groupers) (Those species not listed in Table 3 or are not bottomfish management unit species).	Echineididae (remoras)
Carangidae (jacks/trevallies) (Those species not listed in Table 3 or are not bottomfish management unit species).	Malacanthidae (tilefish)
	Acanthoclinidae (spiny basslets)
Holocentridae spp. (soldierfish/ squirrelfish) (Those species not listed in Table 3).	Pseudochromidae (dottybacks)
Mullidae spp. (goatfish) (Those species not listed in Table 3).	Plesiopidae (prettyfins)
Acanthuridae spp. (surgeonfish/ unicornfish) (Those species not listed in Table 3).	Tetrarogidae (waspfish)
Lethrinidae spp. (emperor fish) (Those species not listed in Table 3 or are not bottomfish management unit species).	Caracanthidae (coral crouchers)
Chlopsidae, Congridae, Moringuidae, Ophichthidae (eels) Muraenidae (morays eels) (Those species not listed in Table 3).	Grammistidae (soapfish)
Apogonidae (cardinalfish)..............	Aulostomus chinensis (trumpetfish)
Zanclidae spp. (moorish idols) (Those species not listed in Table 3).	Fistularia commersoni (coronetfish)
Chaetodontidae spp. (butterflyfish) (Those species not listed in Table 3).	Anomalopidae (flashlightfish)
Pomacanthidae spp. (angelfish) (Those species not listed in Table 3).	Clupeidae (herrings)
Pomacentridae spp. (damselfish) (Those species not listed in Table 3).	Engraulidae (anchovies)
Scorpaenidae (scorpionfish)............	Gobiidae (gobies)
Blenniidae (blennies)..................	Lutjanidae (snappers) (Those species that are not listed in Table 3 or are not bottomfish management unit species)
Sphyraenidae spp. (barracudas) (Those species not listed in Table 3).	Ballistidae/Monocanthidae spp. (Those species not listed in

	Table 3)
Pinguipedidae (sandperches)............	Siganidae spp. (rabbit fish) (Those species not listed in Table 3)
Gymnosarda unicolor....................	Kyphosidae spp. (rudderfish) (Those species not listed in Table 3)
Bothidae/Soleidae/Pleurnectidae (flounder/sole).	Caesionidae (fusiliers)
Ostraciidae (trunkfish)................	Cirrhitidae (hawkfish) (Those species not listed in Table 3
Tetradontidae/Diodontidae (puffer/ porcupinefish).	Antennariidae (frogfishes)
	Syngnathidae (pipefishes/ seahorses)
Stony corals...........................	Echinoderms (e.g., sea cucumbers, sea urchins)
Heliopora (blue corals)................	Mollusca (Those species not listed in Table 3)
Tubipora (organpipe corals)............	Sea Snails (gastropods) (Those species not listed in Table 3)
Azooxanthellates (ahermatypic corals)..	Trochus spp.
Fungiidae (mushroom corals)............	Opistobranchs (sea slugs)
Small and large polyp corals...........	Pinctada margaritifera (black lipped pearl oyster)
Millepora (firecorals).................	Tridacnidae (giant clams)
Soft corals and Gorgonians.............	Other Bivalves (other clams)
Actinaria (anemones)...................	Cephalopods
Zoanthinaria (soft zoanthid corals)....	Crustaceans (Lobsters, Shrimps/ mantis shrimps, true crabs and hermit crabs (not listed as crustacean management unit species)
Sponges (Porifera).....................	Stylasteridae (lace corals)
Hydrozoans.............................	Solanderidae (hydroid corals)
Bryozoans..............................	Annelids (segmented worms) (Those species not listed in Table 3)
	Algae (seaweeds)
Tunicates (sea squirts)................	Live rock
All other coral reef ecosystem management unit species that are marine plants, invertebrates, and fishes that are not listed in Table 3 or are not bottomfish management unit species, crustacean management unit species, Pacific pelagic management unit species, precious coral or seamount groundfish.	

INSERT PICTURE OF LOBSTER CARAPACE LENGTH

INSERT PICTURE OF LENGTH OVERALL

7.0 CHAPTER SEVEN: REFERENCES

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8.0 APPENDIX A: Initial Regulatory Flexibility Analysis and Regulatory Impact Review

Introduction

In order to meet the requirements of Executive Order 12866 (EO 12866) the National Marine Fisheries Service (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. In addition, the Regulatory Flexibility Act, 5 U.S.C. 601 et seq. (RFA) requires government agencies to assess the impact of their regulatory actions on small businesses and other small organizations via the preparation of Regulatory Flexibility Analyses.

This document examines the costs and benefits of regulatory actions proposed for domestic fisheries operating in the proposed Northwestern Hawaiian Islands (NWHI) sanctuary under the Fishery Management Plans for Bottomfish and Seamount, Crustaceans, Precious Corals, Coral Reef Ecosystems and Pelagic Fisheries of the Western Pacific Region (Bottomfish FMP). It also contains analyses of the economic impacts of this action on affected small businesses and other small entities.

Objective and Need for Action

On December 4, 2000, President Clinton issued Executive Order (EO) 13178 establishing the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve (Reserve). President Clinton subsequently revised portions of EO 13178 and completed establishment of the Reserve in EO 13196. The Reserve is managed by the National Marine Sanctuary Program which is within the National Oceanic and Atmospheric Administration (NOAA). Pursuant to the EOs and the National Marine Sanctuaries Act (16 U.S.C. 1433, 1434), NOAA is initiating the process to designate the Reserve as a National Marine Sanctuary. Section 304(a) (5) of the National Marine Sanctuaries Act (NMSA) provides an opportunity for Regional Fishery Management Councils to develop and recommend fishing regulations for proposed sanctuaries.

Consistent with the Section 304(a)(5) process, at its 126th meeting (March 14-17, 2005 in Honolulu, Hawaii) the Western Pacific Regional Fishery Management Council (Council) took final action to recommend specific regulations regarding fishing in the proposed Northwestern Hawaiian Islands (NWHI) sanctuary. On April 14, 2005, the Council transmitted these draft regulations to NOAA for their review and consideration as to whether they were consistent with the purposes and polices of the NMSA as well as the goals and objectives of the proposed sanctuary. On October 24, 2005, NOAA advised the Council that its proposed fishing regulations "do not fulfill the purposes and polices of the NMSA and the goals and objectives of the proposed NWHI sanctuary". NOAA's response went on to say that the agency hoped that the Council would participate in the regulation of NWHI fishing through amendments to its existing or new fishery management plans.

More recently, NOAA has proposed that if the Council were to amend its fishery management plans to accord with NOAA's "sideboards" regarding NWHI fishing there would be a high likelihood that these amended plans would be accepted for the proposed NWHI sanctuary, with associated fishing regulations promulgated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). These "sideboards" include moratoriums on the harvest of crustaceans, precious corals and coral reef ecosystem associated species, area closures, and caps on the number of participants and total harvests in the bottomfish and pelagic fisheries (13 bottomfishing permits with a total annual catch of approximately 350,000 lbs, and 2 pelagic permits with a total annual catch of approximately 180,000 lbs).

On January 18, 2006, the Council received a letter from the Under Secretary of Commerce for Oceans and Atmosphere (see Appendix C) stating that NOAA plans to publish a Draft Environmental Impact Statement (DEIS) and draft fishing regulations for the proposed NWHI sanctuary in June 2006. The Under Secretary informed the Council that NOAA is considering three alternatives in its DEIS. The first would allow limited fishing activities within the proposed sanctuary to continue indefinitely, the second would end such fishing by 2025, and the third would end it after five years following sanctuary designation. The first two alternatives include catch levels and permit limits for the proposed sanctuary. For the five-year alternative, the number of permits would be limited to those permits active at the (yet to be determined) time of designation. The Under Secretary went on to say that while a factual basis supporting the legality of establishing catch and permit limits has not been fully developed, NOAA believes that there is a credible basis for moving forward with proposing such limits through amendments to the Council's existing Fishery Management Plans (rather than as regulations under the NMSA). However to meet NOAA's DEIS timeline, the Council was informed that it would have transmit the amendment package(s) to NOAA no later than May 1, 2006. If one of the alternatives described above is selected by NOAA as a preferred alternative, the agency would review the Council's proposed MSA regulations as a potential implementation mechanism.

In response to the above proposal, this document presents and analyzes a range of alternatives considered by the Council regarding fishing regulations within the proposed NWHI sanctuary. A summary document regarding this issue was mailed to over 3,000 Hawaii-based commercial fishermen and other interested parties in February, 2006. Recipients were also informed of an upcoming series of public hearings on this issue to be held by the Council and NMFS around the State of Hawaii. Hearings were from 6:00-9:00 p.m. held on the following dates and locations:

March 2, 2006	Maui Beach Hotel, Kahului, Maui
March 3, 2006	Helene Social Hall, Hana, Maui
March 6, 2006	University of Hawaii, Hilo, Hawaii
March 7, 2006	Naalehu Elementary School, Naalehu, Hawaii
March 8, 2006	Kohala Elementary School, Kapaau, Hawaii
March 9, 2006	Mitchell Pauole Center, Kaunakakai, Molokai
March 10, 2006	Kapaa High School, Kapaa, Kauai
March 14, 2006	Ala Moana Hotel, Honolulu, Oahu

The alternatives and analyses contained in this document were subsequently considered by the Council at their 131st meeting, held March 13-16, 2006 in Honolulu Hawaii (FR 71, 9522 February 24, 2006). The Council also heard several presentations by NMFS and other scientists regarding the status of Hawaii's bottomfish stocks and marine ecosystem, and took comments from the public. The Council concluded by taking initial action regarding the management of fisheries in the proposed NWHI sanctuary by developing and recommending Alternative 4 as their preliminarily preferred alternative.

Description of Potentially Affected Fisheries

Bottomfish and Seamount Groundfish Fisheries: The deep-slope bottomfish fishery in Hawaii concentrates on species of eteline snappers, carangids and a single species of grouper concentrated at depths of 30-150 fm. The fishery can be divided into two geographical areas (Figure 1): 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. In the MHI approximately 80 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 nm of 100-fathom bottomfish habitat in the Maui-Lānai-Molokai. For management purposes the NWHI fishery has been separated into the Mau Zone, closer to the MHI, and the Ho'omalu Zone.

In addition to the deep-slope fisheries in the MHI and NWHI, there is a potential seamount groundfish fishery in the Hawaiian Islands. A trawl and bottom longline fishery targeting alfonsin and armorhead at the southeast Hancock Seamount in the NWHI was started by Russian and Japanese fishing vessels in the late 1960s (Okamoto 1982). Large catches were made by foreign fishing vessels for about 10 years until overfishing caused the fishery to collapse. A moratorium on the harvest of alfonsin and armorhead on the Hancock Seamounts has been in effect since 1986 in an effort to rebuild the stocks. The moratorium was reissued by the Council and NMFS in September 2004 and therefore in effect until 2010 (69 FR 51400). Because periodic reviews of the stocks indicate that no recovery has occurred and it is unlikely that the moratorium will be lifted in the near future, the seamount groundfish fishery will not be discussed further.

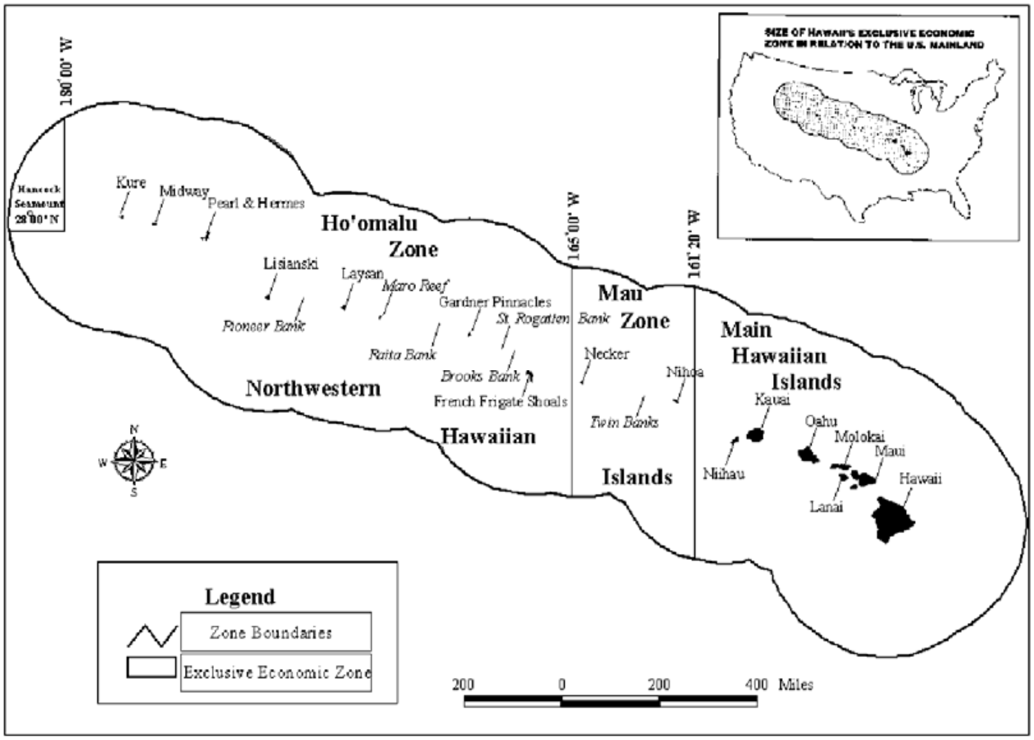

Figure 1: Bottomfish Fishery Management Subareas in the Hawaiian Archipelago

Fishing Methods and Current Use Patterns

The basic design of the handline gear used in Hawaii's bottomfish fisheries has remained essentially unchanged from gear used by early Native Hawaiians (Haight et al. 1993b). The gear consists of a main line with a 2-4 kg weight attached to the terminus. Several 40-60 cm sidelines with circle hooks are attached above the weight at 0.5-1 m intervals. A chum bag containing chopped fish or squid may be suspended above the highest of these hooks. The gear is pulled after several fish are hooked.

All bottomfish fishermen in Hawai target the same assemblage of bottomfish species. The ability to target particular species varies widely depending on the skill of each captain. Electronic navigation and fish-finding equipment greatly aid fishermen in returning to a particular fishing spot and catching desired species with little incidental catch (Haight et al. 1993). According to Hau (1984), *ōpakapaka* is one of the primary target species due to the relatively high price it commands as a result of its constant demand at the fish auction. *Hāpuupuu* and white *ulua* are sought because of their sturdiness and ability to retain good flesh quality. In addition, white *ulua* can be caught in rough sea conditions when other species are difficult to capture. *Kāhala* are one of the least valuable bottomfish because large specimens have a reputation for carrying ciguatera toxin.

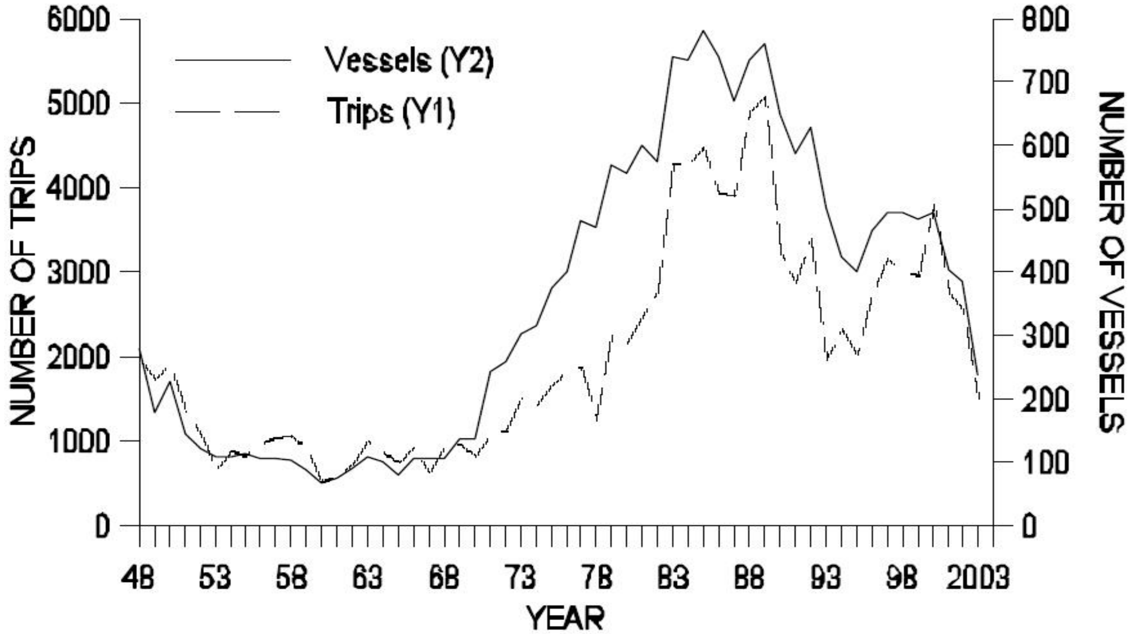

Figure 2: MHI Bottomfish Fishery Participation and Effort
(Source: WPFMC 2004)

Seasonal price variability causes part-time commercial fishermen to concentrate their bottomfish fishing effort during December, when they can take advantage of the year-end holiday demand for red snappers. Pelagic species are often an important secondary target during bottomfish fishing trips regardless of the season.

In contrast to the MHI fishery, bottomfish fishing in the NWHI is conducted solely by part-time and full-time commercial fishermen. The vessels venturing into the NWHI tend to be larger than those fishing around the MHI, as the distance to fishing grounds is greater (Haight et al. 1993b). As the number of vessels participating in the NWHI fishery increased during the 1980s, the fleet characteristics of the fishery became more diverse. Pooley and Kawamoto (1990) divided the fleet into three groups based on size and mode of propulsion: motor sailors, medium-sized powered vessels and large-sized powered vessels. The motor sailors are 46 to 66 ft long and are more streamlined in hull design than the standard powered vessels. The sail can be used to save on fuel costs, but it also limits the hold capacity compared with powered vessels of similar length. The powered vessels generally share one characteristic: a large working area on the back deck. The medium-sized powered vessels are 42 to 49 ft long. Because their smaller size limits fishing range and hold capacity, they usually operate in the lower (southeastern) end of the NWHI (Mau Zone) or in the MHI. The larger powered vessels are 47 to 64 ft long. With an average fuel capacity of 1,500 gallons, the vessels have a maximum range (round-trip) of 1,800 miles. The average maximum hold capacity is 4,000 pounds.

Many of the boats that fish in the Mau Zone switch to different fisheries and move to other fishing grounds during the year. The majority of vessels fish in the Mau Zone during a season that generally extends from November to April. Figure 3 provides the trend in number of bottomfish vessels operating in the NWHI since 1984.

A 1993 survey of participants in the NWHI fishery found that vessels fishing in the Mau Zone made an average of 12.7 trips to the area to target bottomfish and 3.4 trips to target pelagic fish or a mixture of pelagic species and bottomfish (Hamilton 1994). In addition, during that year an average of 5.6 trips were made by these vessels to bottomfish fishing grounds around the MHI. Although bottomfish fishing in the Mau Zone is not the only activity of these boats, it may be vital to the year-round operations of some fishermen.

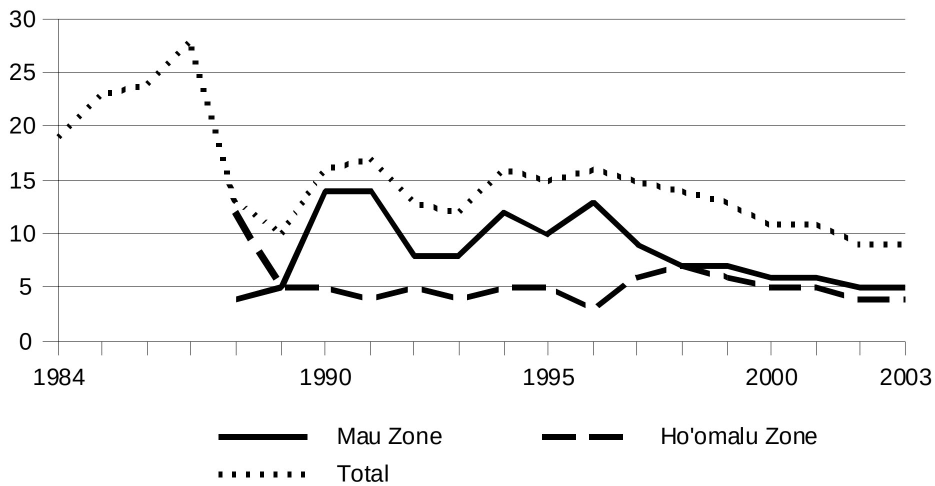

Figure 3: NWHI Bottomfish Fishery Participation (# of vessels)

The fishing strategies and catch levels of vessels fishing in the Ho’omalu Zone tend to be fairly uniform (Pan 1994). The 1993 survey referred to above found that all boats fishing in the Ho’omalu Zone were engaged exclusively in commercial bottomfish fishing (Hamilton 1994). They averaged 9 trips per year to the zone, and the average trip length was about three weeks.

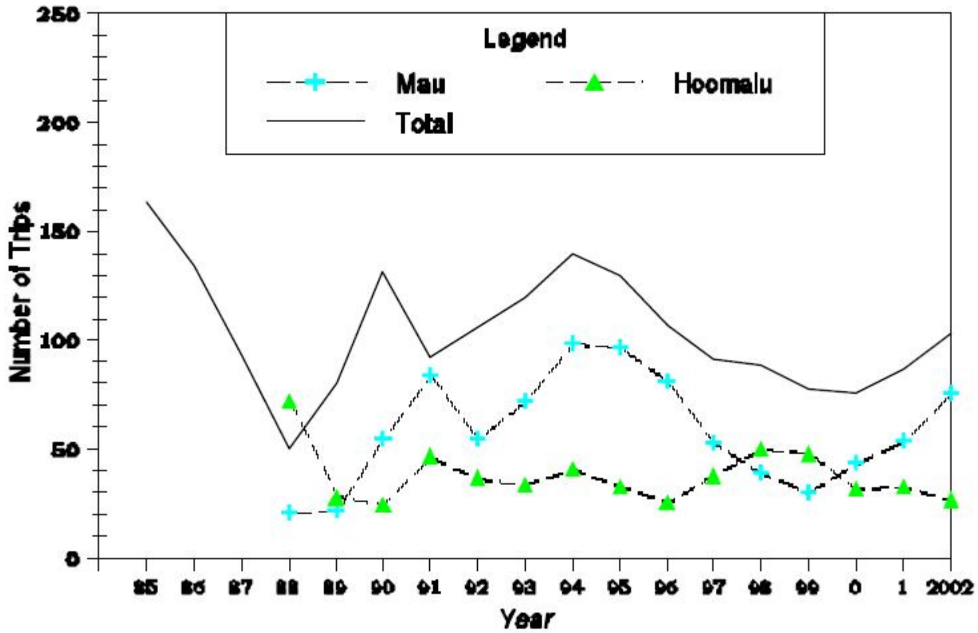

Figure 4: Trend in Number of Trips/year for NWHI Bottomfish Fishery Permit Holders
(Source: WPFMC 2004)

Popular fishing grounds in the Mau Zone include the waters around Nihoa Island and Necker Island (Table 1). Especially productive fishing areas in the Ho'omalu Zone are Brooks Bank, Laysan Island and Gardner Pinnacles.

Table1: Approximate Percentage of Total Catch in NWHI Bottomfish Fishery from Selected Areas Based on Historical Fishing Data

AREA	PERCENT OF TOTAL CATCH
Nihoa Island and Twin Banks	16.6
Brooks Bank and St. Rogatien Bank	14.2
Laysan Island	13.6
Necker Island	13
Gardner Pinnacles	12.9
Lisianski Island	6.8
French Frigate Shoals	5.6
Kure Atoll	4.4
Maro Reef	4.2
Pioneer Bank	4

AREA	PERCENT OF TOTAL CATCH
Raita Bank	2.6
Pearl and Hermes Reef	2.1
Midway Atoll	0

Note: Percentages from NMFS landings data for 1997-1999.
Source: M. Mitsuyasu pers. comm. 2000. WPRFMC

Harvests

Only commercial landings data are available for Hawaii's fisheries because there are no state or federal permitting or reporting requirements for Hawaii's recreational fisheries. It is estimated that the recreational/subsistence catch in the MHI bottomfish fishery is about equal to the commercial catch (WPRFMC 1999). Charter boat operators are considered to be commercial fishermen under Hawaii statute and therefore are required to submit monthly catch reports. Consequently, charter boat catches are included in estimates of commercial landings.

Based on recent (1998-2003) harvest data, commercial bottomfish catches in the NWHI fishery represent approximately 40 percent of the total commercial bottomfish harvest in Hawaii (WPRFMC 2004).

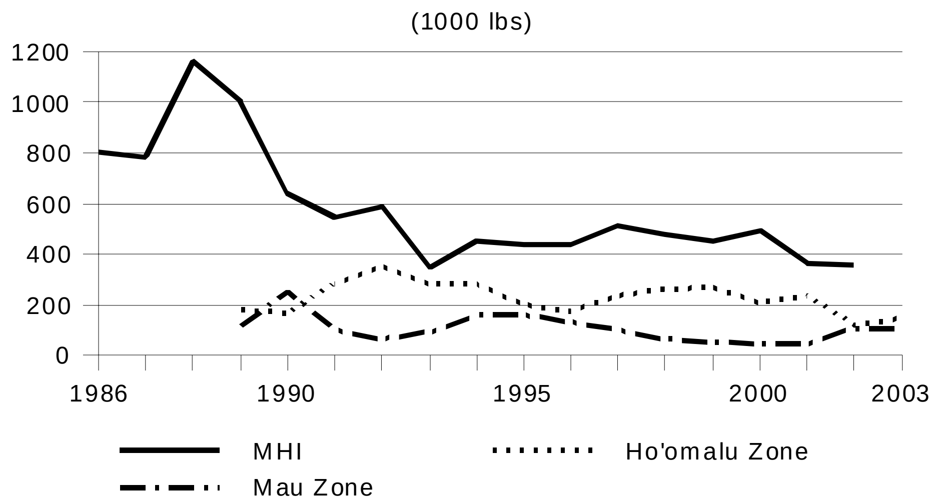

Figure 5: Trends in MHI and NWHI Bottomfish Landings
(Source: WPFMC 2004)

MHI bottomfish landings peaked in 1987 and then declined to relatively stable levels since. Much of this decline was caused by reductions in fishing participation (vessels and trips) due to limited entry and to a weak market for fresh bottomfish since the 1990s. Bottomfish landings from the Mau Zone have increased over recent years to over 100,000 lbs in 2002, and 2003 landings per trip more than doubled as compared to 2001 (Table 2). Trip lengths varied by vessel and trip strategy/target and most of the trips incorporated some trolling activity. The

Ho'omalu Zone showed the reverse pattern with 2003 bottomfish landings up 20.8 percent as compared to 2002 but per trip landings down by 20 percent (Table 3).

Table 2: Historical Annual Statistics for Mau Zone Bottomfish Fishery
(Source: WPFMC 2004b)

Year	Total Landings (lbs)	CPUE (lbs/trip)	Inflation Adjusted Revenue	Price per Pound	Number of Vessels
1986	NA	2,206	NA	NA	NA
1987	NA	2,889	NA	NA	NA
1988	NA	2,136	NA	NA	4
1989	118,000	4,463	$443,680	$3.76	5
1990	249,000	3,435	$836,640	$3.36	14
1991	103,000	1,199	$372,860	$3.62	14
1992	71,000	1,273	$248,500	$3.50	8
1993	98,000	1,321	$306,740	$3.13	8
1994	160,000	1,573	$537,600	$3.36	12
1995	166,000	1,635	$509,620	$3.07	10
1996	135,000	1,543	$449,550	$3.33	13
1997	105,000	1,976	$384,300	$3.66	9
1998	66,000	1,689	$196,680	$2.98	7
1999	54,000	1,808	$182,520	$3.38	7
2000	49,000	1,053	$173,460	$3.54	6
2001	50,000	916	$144,500	$2.89	6
2002	108,000	1,416	$342,360	$3.17	5
2003	77,000	2,070	$222,530	$2.89	5
Ave.	107,267	1,922	$356,769	$3.31	8
s.d.	53,957	894	$183,346	$0.28	3

Table 3: Historical Annual Statistics for Ho'omalu Zone Bottomfish Fishery

Year	Total Landings (lbs)	CPUE (lbs/trip)	Inflation Adjusted Revenue	Price per Pound	Number of Vessels
1986	NA	5,301	NA	NA	NA
1987	NA	8,187	NA	NA	NA
1988	NA	4,702	NA	NA	12
1989	184,000	5,481	$631,120	$3.43	5
1990	173,000	5,403	$576,090	$3.33	5
1991	283,000	5,871	$914,090	$3.23	4
1992	353,000	9,464	$1,221,380	$3.46	5
1993	287,000	8,412	$984,410	$3.43	4
1994	283,000	6,903	$996,160	$3.52	5
1995	202,000	6,130	$650,440	$3.22	5
1996	176,000	6,216	$621,280	$3.53	3
1997	241,000	6,351	$802,530	$3.33	6
1998	266,000	5,315	$837,900	$3.15	7
1999	269,000	5,611	$989,920	$3.68	6
2000	213,000	5,909	$832,830	$3.91	5
2001	236,000	5,757	$769,360	$3.26	5
2002	120,000	4,638	$433,200	$3.61	4
2003	145,000	3,713	$494,450	$3.41	4
Ave.	228,733	6,076	$783,677	$3.43	5
s.d.	63,033	1,416	$217,036	$0.20	2

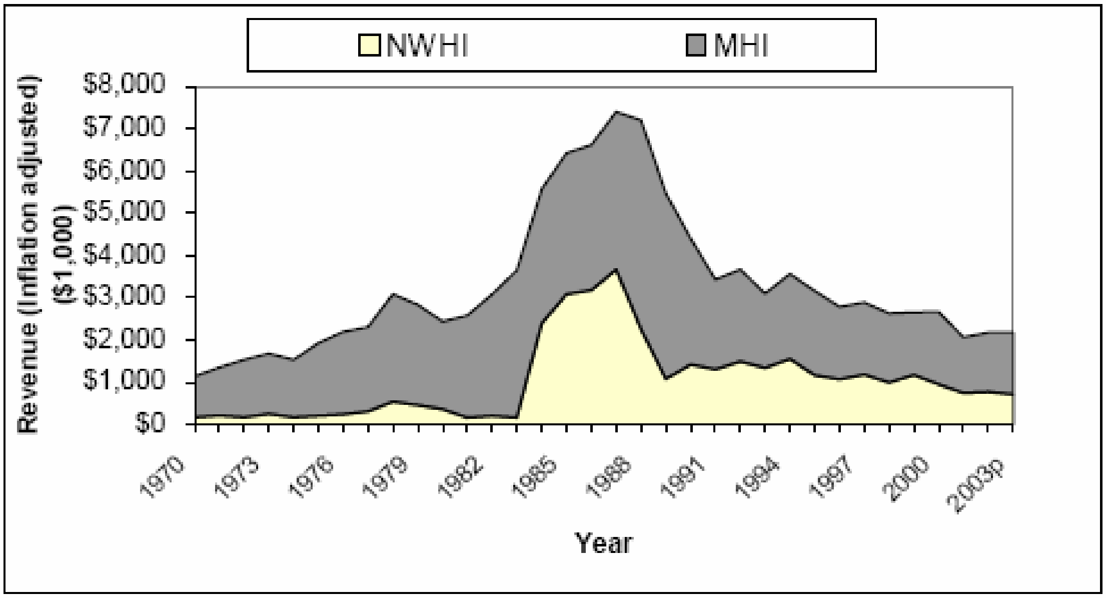

Figure 6: Hawaii Bottomfish Landings Revenue (inflation adjusted) by Area
(Source: WPFMC 2004)

Economic Performance

As shown in Figure 6 the inflation-adjusted gross revenue in the NWHI fishery grew dramatically in the mid-1980s and then declined as landings fell. Inflation-adjusted revenue in 2002 was only 20 percent of the 1987 peak. In recent years, the annual ex-vessel value of bottomfish landings in the NWHI fishery has averaged about $1,000,000. Table 4 presents the results of an examination of the expanded economic impact of Hawaii's bottomfish fisheries.

Table 4. Estimated Output, Household Income and Employment Generated by Bottomfish Fishing Activity in Hawaii

FISHERY	SALES ($)	FINAL DEMAND ($)	OUTPUT ($)	HOUSEHOLD INCOME ($)	EMPLOYMENT (JOBS)[1]
NWHI bottomfish fishery					
Commercial vessels[2]	1,096,200	580,986	1,382,747	482,218	25
MHI bottomfish fishery					
Commercial vessels[2]	1,625,800	861,674	2,050,784	715,189	36

FISHERY	SALES ($)	FINAL DEMAND ($)	OUTPUT ($)	HOUSEHOLD INCOME ($)	EMPLOYMENT (JOBS)[1]
Charter vessels[3]	305,664	293,437	760,002	269,962	14
Recreational vessels[4]		2,827,096	6,587,134	1,046,026	38
Total			10,780,667	2,513,431	113

[1] Calculated as full-time jobs. The input-output model assumes that fishing accounts for 20 percent of the employment time of part-time commercial fishermen (Sharma et al. 1999).
[2] Average annual sales estimate for 1994-1998 from WPRFMC (1999).
[3] Sales estimate based on the following assumptions: 199 active vessels; average annual sales of $76,800 per vessel from charter fees and mount commissions; and 2 percent of total sales attributed to bottomfish fishing trips (Hamilton 1998).
[4] Expenditure estimates based on the following assumptions (Hamilton and Huffman 1997; Pan et al. 1999):

Number of recreational boats	2490
Annual number of bottomfish fishing trips	3.81
Average trip costs	84.75
Average fixed costs: apportioned according to ratio of bottomfish fishing trips to total number of trips	213

Historically, bottomfish caught in the main Hawaiian Islands tended to have higher aggregate prices, reflecting both species composition and greater freshness. However, the MHI price declined in general in 1990s, while NWHI price was relatively steady during the same period. This relative lowering of the MHI bottomfish prices may have reflected the softness of the upscale part of the Hawaii market. As a result, it brought the prices of the two areas to a similar range in 1999, and slightly converge in 2000 as NWHI price was $3.76 and MHI was $3.75. In 2001, the prices from both areas drops, but to a greater degree for bottomfish caught in the Northwestern Hawaiian Islands. In 2002, the prices from both areas increased slightly, but in a greater degree for the MHI price. In 2003, the MHI price continued the increase trend from 2002, while the NWHI price fell slightly. As a result, the MHI price was higher substantially, $1.22 per pound, than NWHI in 2003 (Figure 7).

Onaga and opakapaka comprise the largest valued landings in each area for most years (ignoring the highly fluctuating landings of uku); NWHI ex-vessel prices were $4.53 and $4.79 per pound respectively in 2003 while MHI were $5.89 and $5.01, respectively. However, the NWHI landings are comprised of a higher percentage of these higher priced species compared to the MHI, so the difference in price for individual species by area is ironed out by the different species compositions between the two areas.

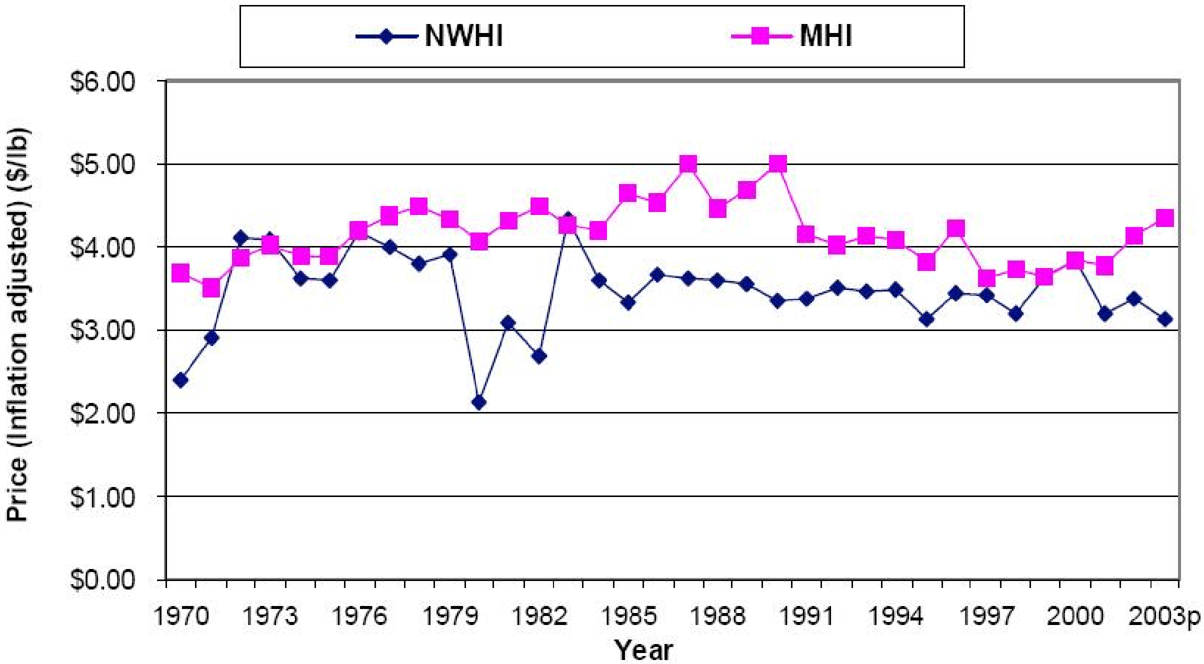

Figure 7: Average Price/lb for Hawaii Caught BMUS
(Source: WPFMC 2004)

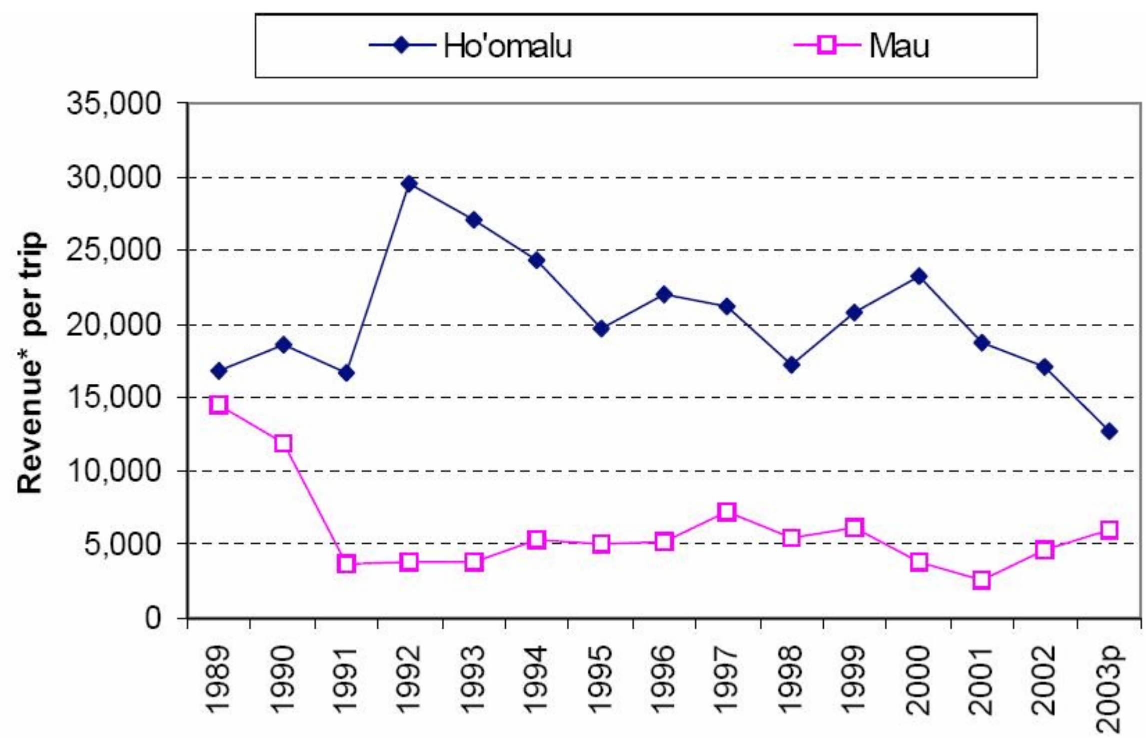

Figure 8: Mau Zone and Ho'omalu Zone Average Revenues per Trip
(Source: WPFMC 2004)

Independent, owner-operator fishing operations prevail in both zones of the NWHI bottomfish fishery. In 1988, a limited access program was established for the Ho'omalu Zone, the primary motivation for which was avoidance of economic overfishing (Pooley 1993b). When the limited access program provisions began to take effect in 1989-91, the revenue per trip for Ho'omalu Zone vessels rose dramatically (Figure 8). Since that time the revenue per trip in the Ho'omalu Zone has consistently been higher than that of the Mau Zone.

The two trends in inflation-adjusted revenue per trip show the distinct difference between Ho'omalu and Mau zone operations. When the limited entry provisions began to take effect in the Ho'omalu zone in 1989-91, revenue rose dramatically but has subsequently declined to slightly more than its average for the period. Revenue (inflation-adjusted) in the Mau Zone initially fell (as the limited entry vessels could no longer fish in the Mau zone, only smaller boats remained in the Mau zone). After that initial drop, however, revenue per trip in the Mau Zone rose for several years, but has subsequently declined from 1997 to 2001. Revenue per trip in Mau Zone rose again in 2002 and 2003, while it declined in Ho'omalu Zone. The limited entry program, which was implemented in the Mau Zone in 2001, may has improved the economic performance for the vessels that have a permit to fish in the Mau Zone.

Estimates of annual net revenue for vessels operating in the Mau Zone and Ho'omalu Zone were first presented in a 1993 cost-earnings profile of the NWHI bottomfish fishery (Hamilton 1994). The study revealed that on average Ho'omalu Zone vessels realized a positive economic return of $2,238 per vessel in 1993 while Mau Zone vessels averaged an economic loss of $21,947 per vessel. The principal factor explaining the disparity in the economic performance of vessels operating in the two zones was the difference in catch rates (Pan 1994). In comparison to boats fishing in the Mau Zone, boats operating in the Ho'omalu Zone caught more fish per fishing day and more of their catch consisted of high-valued bottomfish such as *onaga* and *ōpakapaka*.

Since 1993 however, the revenues of Ho'omalu Zone vessels have shown a downward trend due to decreasing catch rates for some species, particularly the high-priced *ōpakapaka.* As a result of this decrease in revenues, in recent years the average vessel fishing in the Ho'omalu Zone has failed to cover its total annual economic costs through bottomfish fishing (WPRFMC 2003). In 2000, Ho'omalu vessels averaged an economic loss of $38,047 per vessel (Table 20). The average vessel earned a positive return on operations, and presumably vesselowners derive sufficient income from other economic activities to cover fixed costs.

Table 5: Average Income Statement for Vessels Fishing in the Mau Zone and Ho'omalu Zone, 2000

(Source: WPRFMC 2003)

CATEGORY	MAU ZONE VESSELS	HO'OMALU ZONE VESSELS
Revenue	$38,639	$148,522
Fixed Costs:		
Capital	$4,093	$18,056
Annual Repair	$4,840	$12,694
Vessel Insurance	$2,833	$31,516
Administrative	$1,535	$7,441
Other	$0	$1,970
Total	**$13,301**	**$71,678**
Operating Costs:		
Fuel and Oil	$4,158	$9,958
Ice	$1,094	$2,298
Bait	$1,641	$5,253
Handling	$3,900	$14,900
Provisions	$1,751	$7,113
Gear and Supplies	$2,407	$8,426
Other (trip basis)	$3,283	$10,943
Crew's Income	$6,100	$35,000
Captain's Income	$8,800	$21,000
Total	**$33,134**	**$114,892**
Net on Operations	**$5,505**	**$33,631**
Total Cost	**$46,435**	**$186,569**
Net Revenue	**- $7,796**	**- $38,047**

Updated cost-earnings data for vessels operating in the Mau Zone indicate that the net economic returns to the average boat is still negative (Table 5). The poor economic performance of a substantial number of Mau Zone vessels has resulted in a considerable turnover pattern of entry and exit (Hamilton 1994). Between 1989 and 1997, over 15 vessels entered and left the fishery. Because access to the Mau Zone was unrestricted, economic failure of vessels in the fishery did not reduce fishing effort to more appropriate levels (WPRFMC 1998b). Bankrupt vessels were sometimes bought for a fraction of their initial capital cost and returned to the Mau Zone with new owners who believed that reduced capital servicing obligations would give them a competitive edge over other fishermen. In addition, vessels displaced from overfished U.S. mainland fisheries arrived in Hawaii at a steady rate on a “look-see” basis. These owners and captains were largely unaware of the economic performance of those vessels already fishing in the Mau Zone.

In 1999, a limited access program was established for the Mau Zone to support long-term productivity of bottomfish resources in the zone and to improve the economic stability of the fishery (WPRFMC 1998b). The limited access program is intended to decrease the large reserve of potential effort that could threaten the resources and allow attrition due to market forces and freedom of choice to reduce the Mau Zone fleet to more economically rational levels.

Markets

A market for locally caught bottomfish was well-established in Hawaii by the late nineteenth century. Today, fresh bottomfish continues to be an important seafood for Hawaii residents and visitors. Nearly all bottomfish caught in the NWHI fishery are sold through the Honolulu fish auction (United Fishing Agency, Ltd.). Prices received at the auction change daily, and the value of a particular catch may even depend on the order in which it is placed on the floor for bidding (Hau 1984). Bottomfish caught in the MHI fishery are sold in a wide variety of market outlets (Haight et al. 1993b). Some are marketed through the fish auction in Honolulu and intermediary buyers on all islands. Sales of MHI bottomfish also occur through less formal market channels. For example, local restaurants, hotels, grocery stores and individual consumers are important buyers for some fishermen. In addition to being sold, MHI bottomfish are consumed by fishermen and their families, given to friends and relatives as gifts, and bartered in exchange for various goods and services.

Historically, the demand for bottomfish in Hawaii has been largely limited to fresh fish. Seventy years ago Hamamoto (1928) remarked on the fact that fish dealers in Honolulu refused to buy fish that had been harvested in the NWHI and frozen on-board because the demand for this product was so low. In the last few years the price differential between frozen and fresh product has narrowed for some species of bottomfish, but it remains substantial for *onaga* and *ehu*, the two highest priced fish. Until the market for frozen bottomfish develops, participants in the NWHI fishery will be caught in the same on-going dilemma – they must stay out long enough to cover trip expenses, but keep the trips short enough to deliver a readily saleable, high-quality product (Pan 1994). In the past, bottomfish catches from the MHI have tended to command higher aggregate prices than those caught in the NWHI, reflecting a larger proportion of preferred species and greater freshness. Bottomfish caught around the MHI are iced for only one to two days before being landed, whereas NWHI fresh catches may be packed in ice for ten days or more. By the late 1990s, however, the prices appeared to converge, perhaps due to the softness of the upscale part of the Hawaii market as the state’s economic recession continued (WPRFMC 1999).

Catches of bottomfish around the MHI typically consist of plate-sized fish preferred by household consumers in Hawaii and by restaurants where fish are often served with the head on. Bottomfish caught around the NWHI tend to be the medium to large fish (over 5 pounds) preferred for the restaurant fillet market. Because the percent yield of edible material is high, handling costs per unit weight are lower and more uniform portions can be cut from the larger fish.

According to U.S. Customs data for the Port of Honolulu, 801,000 pounds of snapper were imported in 2003 worth $2.26 million ($2.82 per pound). This amounts exceeded domestic supply and thus was a significant factor in ex-vessel prices. Tonga and Australia were the largest sources of fresh snapper, with Fiji and New Zealand also being major sources. Not only has the quantity of foreign-caught fresh fish increased during the last few years, but the number of countries exporting fresh fish to Hawaii has also increased. A decade ago, for example, fresh snapper was exported to Hawaii mainly from within the South Pacific region. In recent years, Tonga and Australia were the largest sources of imported fresh snapper, with Fiji and New Zealand also being major sources, and Viet Nam, Chad (fresh-water fish) and Madagascar as minor sources.

Both the restaurant and hotel trade and the charter fishing industry are closely linked to the tourism base that is so important to Hawaii's economy. A 2004 survey of 24 chefs at Oahu's "white tablecloth" restaurants found that 77% of the chefs reported that bottomfish is on their list of "most desirable fish species" and 43% said that their customers are willing to pay more for Hawaii-caught bottomfish. Although other locations would fill the market demand in Hawaii, many Hawaii restaurant owners and chefs would prefer to have fresh locally caught bottomfish on their menus due to their marketable qualities , i.e. "fresh island fish" (Coffman 2004).

Crustacean Fishery: Most of the information in this section pertains only to the lobster fishery occurring in the NWHI. Because there are few shallow banks in the EEZ around the MHI, the MHI lobster fishery occurs almost entirely within State of Hawaii waters. One federally permitted vessel began to operate in the EEZ surrounding the MHI in 1997, but has since discontinued operations. The NWHI lobster fishery has been inactive since 2000 when NMFS scientists noted an increase in uncertainty of parameters used in the models that are used to predict exploitable populations and provide annual harvest guidelines (currently set at 13% of exploitable populations which has been estimated to result in a 10% risk of overfishing) (65 FR 39314 June 26, 2000). In 2001 NMFS clarified that the NWHI stock was not considered to be overfished (66FR 11156 February 22, 2001). Between 2000 and 2005, NMFS did not issue any harvest guidelines for this fishery, thus prohibiting fishing from occurring. In 2006 NMFS issued a harvest guideline of zero lobsters for the fishery, again prohibiting fishing from occurring. Since 2000, NMFS scientists have been assessing and improving their stock assessment models and a new model is anticipated to be available in the near future.

Fishing Methods and Use Patterns

Two distinct types of vessels have historically operated in the NWHI lobster fishery (Maine Aquaculture Innovation Center 2000). About one-third of the permit holders operate North

Pacific catcher-type crab vessels that travel to Hawaii for the lobster season. The other two-thirds operate Honolulu-based vessels that were also used in the pelagic longline fishery. The North Pacific crabbers are larger than the longline boats, but every vessel had the capability to carry and deploy the maximum number of traps allowed (1,200).

All participants in the 1999 NWHI fishery use a plastic dome-shaped, single-chambered traps with two entrance funnels located on opposite sides (Polovina 1993). Although the minimum size limit established in 1985 was revoked in 1996, traps are still required to have escape vents. The traps are typically fished in strings of several hundred traps per string. The traps are set before sunset in depths from 20 to 70 m, and retrieved the next day. Both spiny and slipper lobsters may be caught in the same trap, but fishermen can alter the proportion of each species by selecting the trapping area and depth (Polovina 1993). Almost all lobsters harvested were sold as a frozen tail product. Catch was processed, packed and frozen at sea by the individual vessels, in contrast to most other lobster fisheries in which each vessel's catch is held live on-board and transported to shore-side plants for processing and packing (Sample and Gates 1987). From 1996 to 1998, the fleet also landed a significant quantity of live lobsters.

This is a seasonal fishery with vessel operators participating in other Hawaiior U.S. mainland fisheries during the remainder of the year. In 1999, the average vessel fished for lobster for 42 days (WPRFMC 2000). Although all participants in the lobster fishery engage in other fisheries, the lobster fishery occurs during a comparatively slow season for alternate fishing activities (NMFS 2000). Therefore, the lobster fishery may represent an important component of the participants' annual fishing operations and income.

Fishing beyond September involves the risk of encountering severe weather. Poor sea conditions increase operational problems, increase trap losses and reduce the fishing effectiveness of traps (Maine Aquaculture Innovation Center 2000).

Necker Island, Gardner Pinnacles and Maro Reef are the most productive banks in the NWHI lobster fishery (Table 6). Since 1998, the first year that area-specific quotas were established, fishermen have spread out their effort over a larger area (Kawamoto and Pooley 2000). During both the 1998 and 1999 seasons all four subareas received fishing pressure. In 1999, the Necker Island, Gardner Pinnacles and Maro Reef Lobster Grounds were closed within two months while the "all other banks" area (General NWHI Lobster Grounds) remained open until the fishery was closed at the end of the year. Five of the six vessels that participated in the fishery that year fished in the General NWHI Lobster Grounds. Three vessels fished on Necker Bank and Gardner Pinnacles and four vessels fished on Maro Reef. The harvest from Necker Island, Gardner Pinnacles and Maro Reef accounted for about 75 percent of the total landings.

Table 6: Approximate Percentage of Total Catch at Selected Areas in the NWHI Lobster Fishery Based on Landings Data

AREA	PERCENT OF TOTAL CATCH
Necker Island	38.5

AREA	PERCENT OF TOTAL CATCH
Maro Reef	34.0
Gardner Pinnacles	14.3
Pearl and Hermes Reef	6.7
Kure Atoll	2.8
Lisianski Island	1.5
French Frigate Shoals	1.2
Nihoa Island	0.6
St. Rogatien Bank	0.3
Pioneer Bank	0.1
Brooks Bank	0.0
Raita Bank	0.0
Twin Banks	0.0
Laysan Island	0.0
Midway Atoll	0.0

(Source: M. Mitsuyasu, pers. comm. 2000. WPRFMC)

Harvest

Between 1985 and 1991, total landings showed an overall downward trend (Figure 9). Since 1992, landings have been largely determined by a harvest quota. The catch per unit effort (CPUE) expressed as number of lobsters caught per trap haul showed an overall decrease between 1983 and 1991 (Figure 15). There was an increase in CPUE in 1996 and 1997, followed by another decline. It is uncertain, because of the lack of catch size data, if the increased CPUE in 1996 and 1997 resulted from the 1995 implementation of Amendment 9, which instituted the "retain-all" policy. The retain all policy was put into place to offset the high lobster mortality associated with the handling and discarding (e.g. predation) associated with the NWHI lobster fishery. Using an equilibrium yeild-per-recruit model, Kobayashi (2001) found that that the reproductive potential of the NWHI lobster population more than doubled and mean weight per individual increased by 22 percent if the mortality rate of lobsters was above 75 percent. In 1996, the fishery had a discard rate of 62 percent with the discard mortality presumed to be above 75 percent (Dinardo et al. 2002). In response, te Council amended the Crustaceans FMP in 1996 to require the retention of all lobsters caught in the NWHI lobster fishery so that these mortalities would be subject to the quota on total catch.

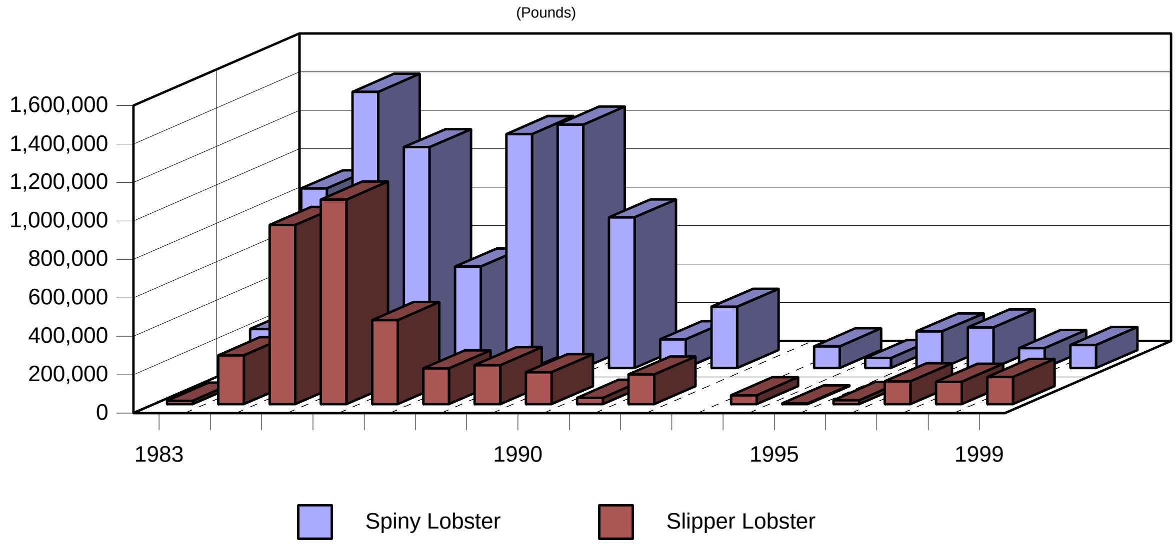

Figure 9: Landings of Spiny and Slipper Lobsters in the NWHI Lobster Fishery, 1983-1999
(Source: PIFSC 2002)

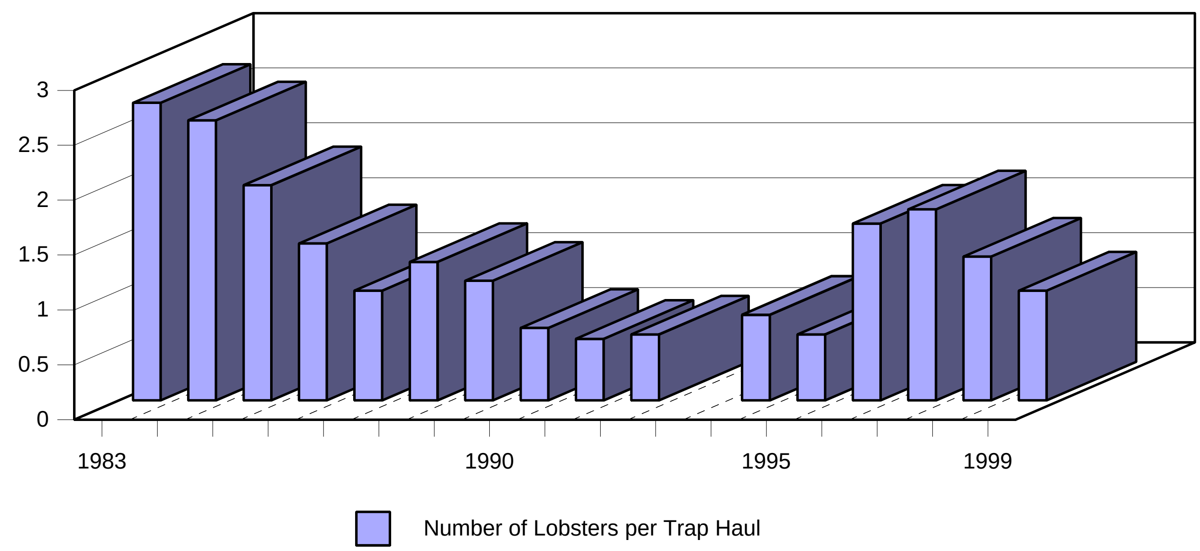

Figure 10: Catch per Unit Effort in the NWHI Lobster Fishery, 1983-1999
(Source: PIFSC 2002)

Participation

At present, the 15 federal limited access permits for the NWHI lobster fishery are owned by 12 permit holders.[16]

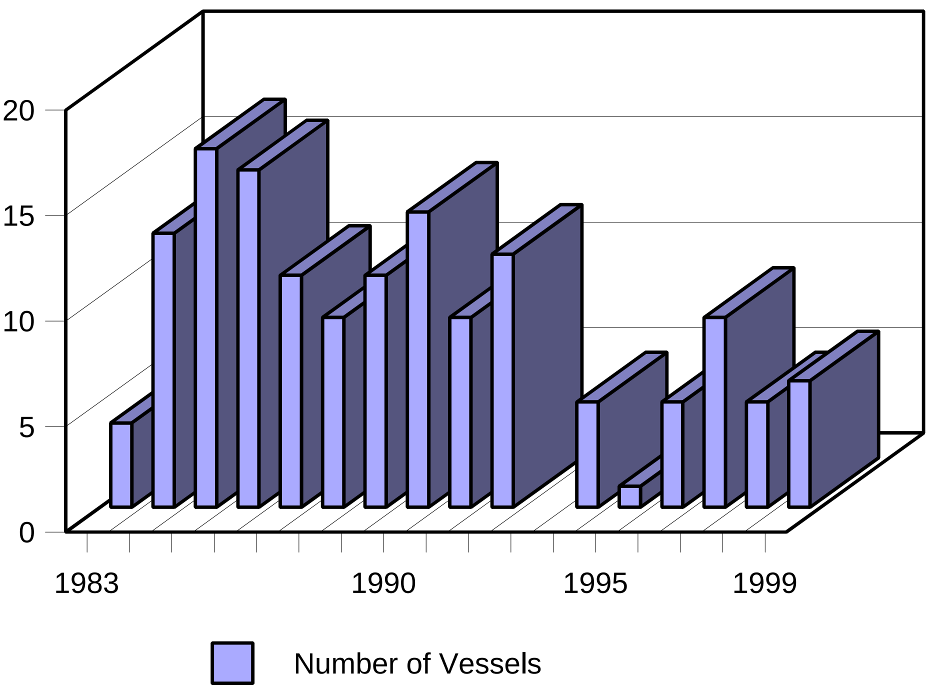

Figure 11: Trend in Number of NWHI Lobster Vessels

During the first years of the fishery the turnover of participants was relatively high due to the profit seeking entry-exit behavior by vessel owners who were flexible in the choice of fishing activities (Samples and Sproul 1988). The high turnover continued after 1992, the first year of the limited access program and harvest quota. The quota announced prior to the start of the fishing season weighed heavily in the participation decision as did the annual start-up costs of participating in the lobster fishery and the potential earnings in alternative fisheries (Kawamoto and Pooley 2000). In addition, during the first five years of the limited access program there were a total of 20 permit transfers. By 1997, less than half of the permits that were issued in 1991 were still held by the original recipients.

To date, approximately 37 limited access permits to participate in the NWHI lobster fishery have been issued, but only 19 of the permits have been actually used (Figure 11). The turn-over rate has been fairly high, with only 4 of the 19 active permit holders participating in the fishery for more than two years (Katekaru, 2001, pers. comm.).

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16 The federal regulations that established the limited access program for the NWHI lobster fishery in 1992 prohibit an individual, partnership or corporation from holding a whole or partial interest in more than one permit. However, two qualified individuals who held multiple permits at the time the limited access program was implemented were allowed to retain all of their permits.

Economic Performance

The total gross revenue of the NWHI lobster fishery has followed the trend in landings (Figure 12).The average gross revenue per trap has declined sharply since 1997 due to the overall decrease in CPUE and the higher catches of slipper lobsters which have a smaller average size and lower ex-vessel value in comparison to spiny lobsters (Kawamoto and Pooley 2000).

A cost-earnings study of the NWHI lobster fleet was conducted by Clarke and Pooley (1988) based on economic data collected in 1985 and 1986. The study found that despite record revenues in the fishery in 1986, fishermen as a group earned little or no economic profit. Low fleet net returns appeared to be tied to high fishing costs and diminished average catch rates. That study does not reflect current operational characteristics of the fleet, as the fishery in the mid-1980s was essentially a year-round fishery.

Since the mid-1980s, adjustments in the regulatory regime for the fishery have changed the economic conditions of the fishery (Pooley and Kawamoto 1998). Because the fishery is now seasonal rather than year-round, start-up costs have become significant determinants in yearly participation by permit holders. The brief fishing season means that fixed costs have to be amortized over a shorter time period. Similarly, travel costs have become a higher percentage of total costs due to a decrease in the number of fishing days per trip. The establishment of area-specific quotas in 1998 and the resultant successive closure of banks during the 1998 and 1999 seasons as quotas were reached caused an increase in travel times and associated vessel operating costs as vessels were forced to move from bank to bank (WPRFMC 1999).

At least some of the permit holders have been able to adapt to these changing economic conditions. Fishery participants during the 1998 season realized a positive return on operations (gross revenues less operating costs) and were able to cover a portion of their fixed costs (WPRFMC 1999). In addition, the market value of the freely transferable limited access permits indicates that both economic and financial profits can still be earned in the fishery. Although the price of transferred permits is not recorded by NMFS, dockside reports in 1998 indicated that a permit was worth $40,000 to $100,000 (Pooley and Kawamoto 1998). However, the fact that generally only about half of the permits holders participated in the fishery in recent years suggests that profits from lobster fishing are low as compared to other available activities (Maine Aquaculture Innovation Center 2000). The MHI represent the young portion of the Hawaiian Archipelago. Consequently, they have less well-developed fringing reefs that have not subsided as far below sea level as those in the NWHI (Green 1997). The best reef development and highest live coral cover in the MHI are found in areas sheltered or partially sheltered from open ocean swell (Grigg 1997).

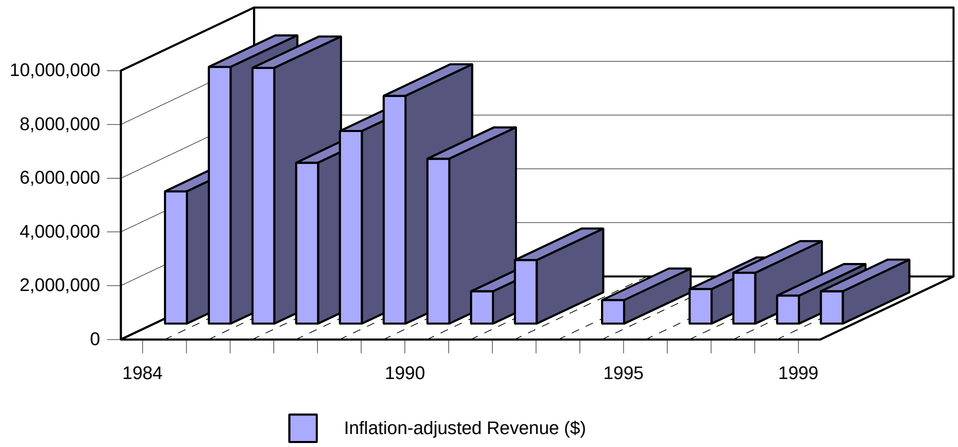


Figure 12: Inflation adjusted Revenue from the NWHI Lobster Fishery, 1983-1999
(Source: PIFSC 2002)

Markets

As an internationally traded commodity, supply and demand circumstances for lobsters tend to be volatile, resulting in frequent price adjustments (Samples and Gates 1987). In addition, the Hawaii fishery has changed over the years in terms of target species and product form. In the early years of the fishery (1977-1984) landings consisted mainly of spiny lobsters. However, for a three-year period from 1985 to 1987 the fishery targeted a previously lightly exploited population of slipper lobsters (Polovina 1993). Between 1988 and 1997 the target was again spiny lobsters, but the catch in 1998 and 1999 consisted mainly of slipper lobsters.

The traditional way of marketing lobsters in Hawaii was selling them live in local markets (HDAR 1979). In 1978, however, a Hawaii-based fishing company leased a modern fishing boat from the U.S. mainland equipped with on-board refrigeration for storing frozen lobster tails. Soon almost all lobsters harvested in Hawaii were sold as a frozen tail product to Hawaii and U.S. mainland buyers (Pooley 1993). This product form dominated until 1996, when the fleet landed a significant amount of live lobsters, which were exported to Japan, Taiwan and Hong Kong or sold in up-scale restaurants in Hawaii (Pooley and Kawamoto 1998). In 1999, however, nearly all fishery participants reverted to producing frozen tails because of a drop in the price of live spiny lobsters caused by the economic downturn in Asia (Kawamoto and Pooley 2000).

Because the NWHI lobster fishery is relatively small and harvest levels have fluctuated widely, product marketing has been challenging (NMFS 2000). Typically, seafood wholesalers and retailers prefer predictable and reliable supply sources. However, NWHI lobster have established a reputation as a locally-produced quality product, and fishery participants have found buyers willing to participate on a seasonal basis.

Imports of frozen lobster tails into Hawaii from various Pacific Basin countries have shown an overall decline over the past decade, from 41,023 lbs in 1990 to 3,866 lbs in 1999 (NMFS Fisheries Statistics and Economics Division n.d.). A small number of live spiny lobsters are imported into Hawaii from Australia and Kiribati. The average annual amount during the past decade has been about 1,450 lbs (NMFS Fisheries Statistics and Economics Division.).

Precious Corals Fishery

In 1965, Japanese coral fishermen discovered a large bed of pink coral (*Corallium* spp.) on the Milwaukee Banks in the Emperor Seamount Chain near the northwestern end of the Hawaiian Archipelago (Grigg 1993). Intermittently, over the next two decades dozens of foreign vessels employed tangle-net dredges to harvest precious corals in the waters around the NWHI. During the 1980s, Japanese and Taiwanese coral vessels frequently fished illegally in the EEZ near the Hancock Seamounts (Grigg 1993). In 1985, Taiwanese vessels reportedly poached about 100 tons of pink coral from north of Gardner Pinnacles and Laysan Island (Grigg 1993). The discontinuation of poaching in the late 1980s probably indicated that the resources in those areas were reduced to the point that the fishery was no longer economically viable. (Carleton 1987).

In 1966 researchers at the University of Hawaii located a small bed of pink coral off Makapuu, Oahu. Over the next three years, a small group of fishermen harvested this bed using tangle net dredges. By 1969, the precious coral industry in Hawaii was producing about $2 million in retail sales. Part of these sales consisted of pink coral jewelry imported from Taiwan and Japan. Further research on precious corals conducted by the University of Hawaii led to the development of a selective harvesting system using a manned submersible. Starting in 1973, Maui Divers of Hawaii, Inc., the leading manufacturer and retailer of precious coral jewelry in Hawaii, adopted this system for the commercial harvest of pink, gold and bamboo coral at the Makapuu Bed. However, harvest operations were discontinued in 1978 because of high operating costs.

In 1988, the domestic vessel *Kilauea* used a tangle net dredge to harvest beds at Hancock Seamount. The owners of the *Kilauea* received a federal Experimental Fishing Permit that allowed them to collect an amount of precious coral in excess of the harvest quotas that had been established by the WPRFMC in 1980. However, their catch consisted mostly of dead or low quality pink coral, and the operation was soon discontinued (Grigg 1993). One company in Hawaii experimented with manned submersibles and remotely operated vehicles (ROVs). These technologically advanced devices are equipped with spotlights, cameras and a variety of maneuverable tools. It is possible to harvest individual colonies, place the cut material in collecting cages and bring them to the surface in a highly controlled and efficient manner (Carleton 1987). While this fishing gear is still very expensive, innovations in submersible technology within the petroleum and defense industries during the past two decades have significantly reduced the capital and operating costs. In particular, the expense of operating manned submersibles has declined, one reason being that the submersibles are smaller and, consequently, the tender vessels can be smaller. This operation has been discontinued.

The worldwide glut of *Corallium* produced during the boom years of the early 1980s caused the market value of pink coral to fall even below breakeven prices for Taiwanese and Japanese coral fishermen (Grigg 1993). Consequently, many fishermen dropped out of the fishery and the worldwide supply of deep-water precious corals has dwindled. For the past 20 years Hawaii businesses engaged in the manufacture of deep-water precious coral jewelry have relied on local stockpiles of gold coral and imports of pink coral from foreign suppliers. Prices for precious corals gradually increased, and specimens of the highest quality pink coral currently sell for

$5,000/lb in international auctions. However, changes in the jewelry industry during the past decade may have diminished the demand for precious corals. Products such as black pearls have captured a substantial share of the market formerly held by precious corals (C. Marsh, Maui Divers of Hawaii, Inc., pers. comm.). In 1993 Hawaii's precious coral jewelry industry was valued at about $25 million at the retail level (Grigg 1993).

Coral Reef Ecosystems Fishery: Main Hawaiian Islands - In recent decades, there has been a notable decline in nearshore fishery resources in the main Hawaiian Islands (Shomura 1987). Overfishing is considered to be one of the major causes of this decline (Grigg 1997; Harman and Katekaru 1988), but coastal construction, sedimentation, and other effects of urbanization have caused extensive damage to coral reefs and benthic habitat near the populated islands.

The majority of the total commercial catch of inshore fishes, invertebrates, and seaweed comes from nearshore reef areas around the MHI. The exceptions are crustaceans: over 90 percent of the spiny lobster landings come from the NWHI and over 50 percent of Kona crab landings come from Penguin Bank.

Limited information is available on coral reef fish community structure at Penguin Bank. An investigation of deepwater artificial reefs on the bank, using manned submersibles, recorded 62 taxa (25 families), of which 32 were considered resident, 25 transient, and five incidental (Friedlander 1996). Estimates of mean biomass ranged from 3-290 mt/km^2 for resident species to 90-2,460 mt/km^2 for transient species. However, these estimates are considered high for the area, since several studies have shown that artificial reefs tend to support a higher biomass than natural reefs under similar circumstances.

When reef-associated species that are presently managed under other Council FMPs are excluded from the analysis, almost all of the coral reef fisheries in Hawaii take place in inshore (state) waters in the MHI (Friedlander 1996). For example, in Hawaii less than 12 percent of the inshore fishes are caught in federal waters, based on reported commercial catch from 1991-1995. Similarly, only 18 percent of molluscs, 1 percent of seaweeds, and no echinoderms are harvested in federal waters. Of the crustaceans, less than 50 percent of the reported commercial catch of Kona crab—or 14,191 lbs. valued at $57,436—were taken in federal waters on Penguin Bank. Overall, only 1 percent of total catch, measured either by weight or value, comes from EEZ waters.

Northwestern Hawaiian Islands

Surveys of the NWHI demonstrate that coral reefs are in good condition (Maragos and Gulko 2002) with high standing stocks of many reef fish. Nearshore coral reefs receive little human use because of their remoteness, exposure to harsh seasonal ocean conditions, and their protected status as part of a national wildlife refuge. Most of the shallow reefs of the NWHI lie within the boundaries of the State of Hawaii, where access and resource use are controlled by special permit.

There is a long history of fishing in the NWHI. Iverson et al. (1989) found ample evidence of fishing by the ancient Hawaiians as far northwest as Necker Island. Starting in the 1920s, a handful of commercial boats ventured into the NWHI to fish for shallow and deepwater bottomfish, spiny lobsters, and other reef and inshore species. Black-lipped pearl oysters at Pearl and Hermes Reef in the NWHI were overfished in the late 1920s and recent surveys show that stocks have still not recovered, due to lack of suitable oyster shell habitat (Green 1997). As discussed above, from the late 1940s to the late 1950s, there was a fishery for *akule* and reef fish around French Frigate Shoals and Nihoa Island.

Currently, there are no coral reef fisheries operating in the NWHI. Occasional visitors, including federal government personnel and contract workers at Midway Atoll, fish recreationally in the NWHI. Because NMFS disapproved those aspects of the Council's Coral Reef Ecosystems Fishery Management Plan that would have applied to the NWHI (69 FR 8336 February 24, 2004), there are currently no federal MSA permit or reporting requirements or other management measures for commercial or recreational fishermen targeting these species in the NWHI.

Pelagic Fishery: Hawaii's pelagic fisheries are small in comparison with other Pacific pelagic fisheries, but comprise the largest fishery sector in the State of Hawaii (Pooley 1993) (Table 7). Tuna, billfish and other tropical pelagic species supply most of the fresh pelagic fish consumed by Hawaii residents and support popular recreational fisheries (Boggs and Kikawa 1993).

The longline fishery accounted for the majority of Hawaii's commercial pelagic landings (17.3 million lb) in 2003 (Table 7-28). The fleet includes a few wood and fiberglass vessels, and many newer steel longliners that were previously engaged in fisheries off the U.S. mainland. None of the vessels are over 101 ft in length and the total number is limited to 164 vessels by a permit moratorium. Longline fishing is prohibited with 50 nm of the NWHI (56 FR 522214 October 18, 1991) which corresponds to the boundaries of the proposed NWHI sanctuary.

The Hawaii-based skipjack tuna, or *aku* (skipjack tuna) fishery, is also known as the pole-and-line fishery or the bait boat fishery because of its use of live bait. The *aku* fishery is a labor-intensive and highly selective operation. Live bait is broadcast to entice the primary targets of skipjack and juvenile yellowfin tuna to bite on lures made from barbless hooks with feather skirts. Tuna are hooked on lines and in one motion swung onto the boat deck by crew members. The aku fishing fleet has declined from a maximum of 32 vessels in the 1950s to only 2-3 vessels. In 2003 this fleet landed about 700,000 lbs of fish (Table 24).

Pelagic handline fishing is used to catch yellowfin and bigeye tunas with simple gear and small boats. Handline gear is set below the surface to catch relatively small quantities of large, deep-swimming tuna that are suitable for *sashimi* markets. This fishery continues in isolated areas of the Pacific and is the basis of an important commercial fishery in Hawaii (Table 7). Three methods of pelagic handline fishing are practiced in Hawaii, the *ika-shibi* (nighttime) method, the *palu-ahi* (daytime) method and seamount fishing (which combines both handline and troll methods).

Troll fishing is conducted by towing lures or baited hooks from a moving vessel, using big-game-type rods and reels as well as hydraulic haulers, outriggers and other gear. Up to six lines rigged with artificial lures or live bait may be trolled when outrigger poles are used to keep gear from tangling. When using live bait, trollers move at slower speeds to permit the bait to swim "naturally." The majority of Hawaii-based commercial troll production is generated by part time fishermen; however, some full-time commercial trollers do exist.

The total volume of pelagic fish caught annually from the NWHI by the commercial pelagic handline and troll fishery amounts about 450,000 lbs (Reginald Kokubun, Hawaii Division of Aquatic Resources, pers comm.), comprising principally yellowfin tuna and wahoo. Total pelagic fish catches in Hawaii, from commercial and recreational fishing amount to about 33 million lbs, of which the NWHI amount to about 1.4 percent. Yellowfin biomass in the Central and Western Pacific is currently estimated to lie between 1.5 and 3.1 million mt (Hampton et al, 2004). The total volume of yellowfin caught annually from the NWHI by the commercial mixed handline and troll fishery amounts about 170,000 lbs (77 mt) (Reginald Kokubun, Hawaii Division of Aquatic Resources, pers comm.), or 0.003-0.005 percent of the biomass

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.

The recreational fleet primarily employs troll gear to target pelagic species. Although their motivation for fishing is recreational, some of these vessel operators sell a portion of their landings to cover fishing expenses and have been termed "expense" fishermen (Hamilton 1999). While some of the fishing methods and other characteristics of this fleet are similar to those described for the commercial troll fleet, a survey of recreational and expense fishermen showed substantial differences in equipment, avidity and catch rates compared to commercial operations. Vessel operators engaged in subsistence fishing are included in this recreational category.

Because there are no state or federal permit or reporting requirements for Hawaii's fisheries, little is known about the scale of recreational fishing activities in the NWHI. A charter vessel operation was maintained at Midway Atoll by an eco-tourism operator, but this activity terminated in 2002. Some long range charter operators may be interested in fishing in the NWHI (David Itano, University of Hawaii pers comm.) where competition for pelagic fish is several orders of magnitude lower than in the Main Hawaiian Islands.

Table 7: Fishery information for Hawaii's non-longline pelagic fisheries for 2002
(Source: WPRFMC, 2004b)

Gear/Vessel Type	**Troll/Handline**	**Pole-and-line Fishery** *(Aku Fishery)*
Area Fished	Inshore and EEZ	Inshore and EEZ

Gear/Vessel Type	Troll/Handline	Pole-and-line Fishery *(Aku Fishery)*
Total Landings	3.4 million pounds	696,000 pounds
Catch Composition	48 percent yellowfin 18 percent mahimahi 10 percent wahoo 8 percent albacore 7 percent blue marlin	99.6 percent skipjack tuna <1 percent <1 percent <1 percent <1 percent
Season	All year	All year
Active Vessels	1455	6
Total Permits	NA	NA
Total Trips	18700	198
Total Ex-vessel Value	$8 million	$1.1 million

Description of the Alternatives

This section describes the alternatives currently being considered as amendments to the Council's Fishery Management Plans. These range from No Action (Alternative 1) to a ban on all fishing within the proposed NWHI sanctuary (see Figure 13) that would take effect five years after the (yet to be determined) sanctuary designation.

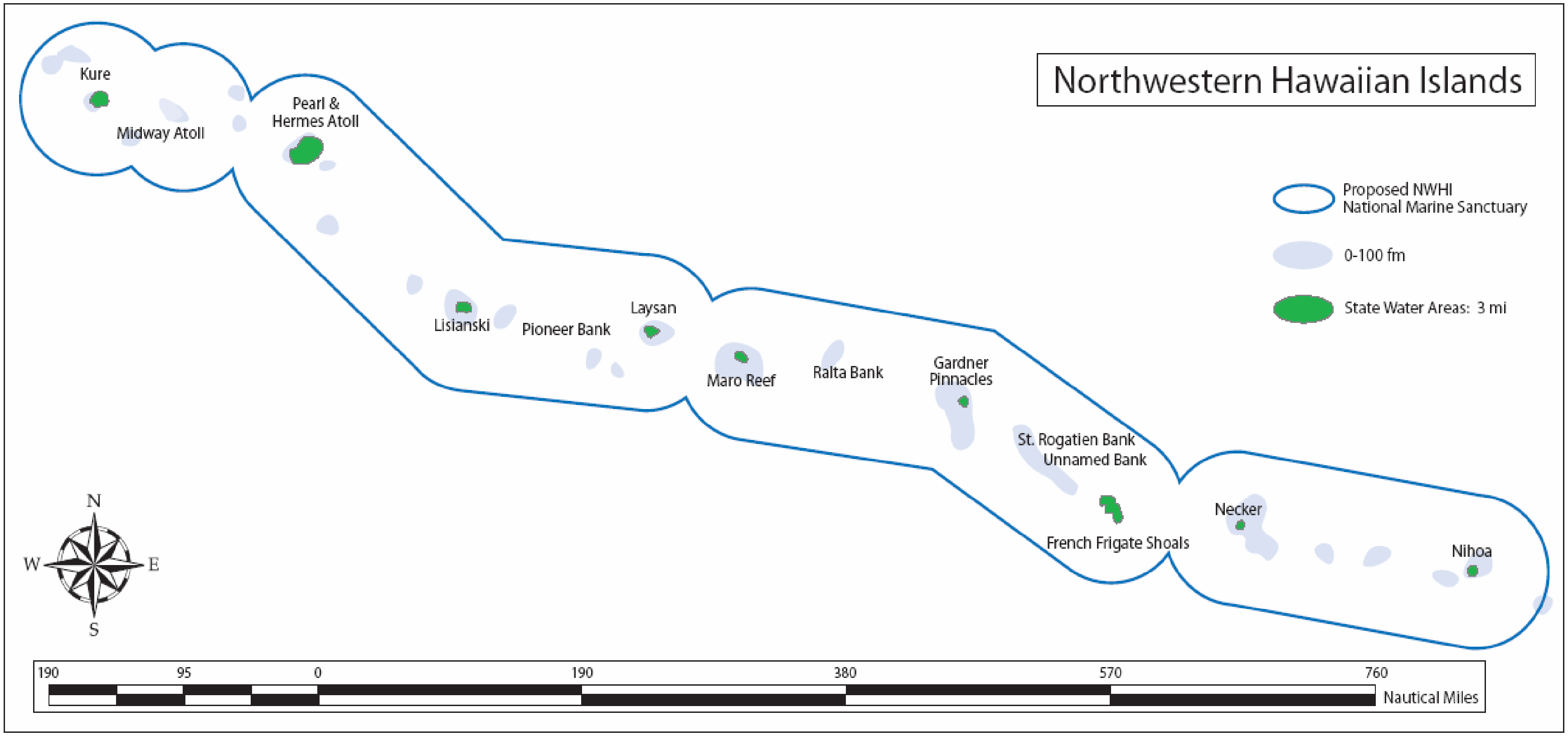


Figure 13: Proposed NWHI Sanctuary

Alternative 1A: FMP Status Quo (No Action A)

Under this alternative, all NWHI federal fisheries would be conducted according to the existing management measures of the following five FMPs that have been developed, approved, and implemented for the NWHI by the Council NMFS. Please see section 660 of Title 50 of the Code of Federal Regulations for the regulations implementing the following FMPs. Under all alternatives, rules implemented in September 2005 by the State of Hawaii that prohibit all entry (and fishing) within state waters around the NWHI without a special permit would remain in place.

Bottomfish and Seamount Groundfish FMP

The NWHI bottomfish fishery is divided into two sections, the more northern Ho'omalu Zone and the southerly Mau Zone. Each zone is managed under a limited entry program with no more than seven vessels allowed in the Ho'omalu Zone and no more than ten allowed in the Mau Zone. Bottom trawling, nets, poison, explosives and other destructive gears are prohibited. Vessels can be no more than 60 ft in length and vessel captains must attend protected species workshops and carry federal observers if requested by NMFS. Fishing for armorhead is prohibited on the Hancock Seamount while stocks recover from the impacts of foreign fishing prior to the implementation of the Magnuson-Stevens Fishery Conservation and Management Act.

The Bottomfish and Seamount Groundfish FMP was implemented in 1986. It prohibits certain destructive fishing techniques, including explosives, poisons, trawl nets and bottom-set gillnets; establishes a moratorium on the commercial harvest of seamount groundfish stocks at the Hancock Seamounts; and implements a permit system for fishing for bottomfish in the EEZ around the NWHI. (The moratorium on the commercial harvest of seamount groundfish stocks at the Hancock Seamounts, the only exploitable seamount habitat in the management area, remains in effect. At its 123rd meeting (June 21-24, 2004), the Council approved an extension of the moratorium until August 31, 2010 (69 FR 51400). Consequently, there is no seamount groundfish fishery in the region. The plan also establishes a management framework that includes adjustments such as catch limits, size limits, area or seasonal closures, fishing effort limitation, fishing gear restrictions, access limitation, permit and/or catch reporting requirements and a rules-related notice system.

Implemented in 1987, Amendment 1 includes the establishment of potential limited access systems for bottomfish fisheries in the EEZ surrounding American Samoa and Guam within the framework measures of the FMP. Amendment 2 (1988) divides the EEZ around the NWHI into two zones: the Ho'omalu Zone to the northwest and the Mau Zone to the southeast. The amendment also establishes a limited access system for the Ho'omalu Zone. Amendment 3 (1991), which has been supplanted by Amendment 6, defined recruitment overfishing as a condition in which the ratio of the spawning stock biomass per recruit at the current level of fishing to the spawning stock biomass per recruit that would occur in the absence of fishing is equal to or less than 20 percent. Amendment 3 also delineated the process by which overfishing is monitored and evaluated. Amendment 4 (1990) requires vessel owners or operators to notify

NMFS at least 72 hours before leaving port if they intend to fish in a 50 nm “protected species study zone” around the NWHI. This notification allows federal observers to be placed on board bottomfish vessels to record interactions with protected species if this action is deemed necessary. Amendment 5 (1999) establishes a limited access system for the Mau Zone and a framework for a Western Pacific Community Development Program. Amendment 6 (1999) identifies and describes essential fish habitat for managed species of bottomfish, discusses measures to minimize bycatch and bycatch mortality in the bottomfish fishery, provides criteria for identifying when overfishing has occurred in the fishery and describes fishing communities in the Region. Amendment 6 initially was only partially approved, with the provisions for bycatch, overfishing and fishing communities in Hawaii disapproved. The disapproved provisions were rewritten and the revised provisions have been implemented. Amendment 7 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Bottomfish and Seamount Groundfish Management Unit Species (BMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also recommended for the NWHI, but all measures recommended in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with Executive Orders 13178 and 13196.

Crustaceans FMP

A limited entry program is in place for the NWHI lobster fishery, with no more than 15 vessels allowed in the NWHI. The fishery is further limited by an annual harvest guideline. Because the majority of fishing occurs around Necker Island, Maro Reef, and Gardner Pinnacles, this harvest guideline is divided into four fishing areas (the fourth is “all other areas”). No harvest guideline has been issued by NMFS for this fishery since 1999, due to uncertainties in the population modeling results. This model calculates the exploitable biomass in each fishing area; managers then determine the annual harvest based on a given risk of overfishing ratio. Through 1999 this ratio indicated that an annual harvest of 13 percent of the exploitable population was associated with a 10 percent risk of overfishing, and these were the harvest and risk levels that were chosen. When an anticipated new model is released by NMFS it may contain a different risk ratio and managers may have to choose a new harvest level to maintain the 10 percent risk level. Fishery participants must use specified traps designed to allow small lobsters to escape, as well as to prevent monk seal entanglement. Federal observers are carried on every vessel and no lobster fishing is permitted within 20 miles of Laysan Island or within 10 fathoms of all other NWHI.

The FMP was implemented in 1983. Initial provisions in the FMP include: a prohibition on fishing for spiny lobster within 20 nm of Laysan Island and within the EEZ landward of the 10 fm curve as depicted on National Ocean Survey Charts Numbers 19022, 19019, and 19016; a minimum size limit; requirements for gear design; prohibitions on retention of ovigerous females; and a mandatory federal logbook and permit program. Since its implementation in 1983, the FMP has been amended ten times. Amendment 1, implemented in 1983, adopted State of Hawaii regulations in the EEZ around the main Hawaiian Islands (MHI). Amendment 2, implemented in 1983, specified trap opening dimensions. Amendment 3, implemented in 1985, clarified definitions for minimum size and tail length. Amendment 4, implemented in 1986, prohibited all lobster fishing in the FMP closed areas in the NWHI. Amendment 5, implemented in 1987, established a minimum size for retained slipper lobsters and required escape panels in traps. Amendment 6, implemented in 1990, defined recruitment overfishing. Amendment 7, implemented in 1991, established a closed season, limited access system and adjustable annual harvest quota. Amendment 8, implemented in 1994, eliminated the "use-it-or-lose-it" landing requirement for permittees. Amendment 9, implemented in 1995, revised the annual harvest guideline and, based on high discard mortality rates, replaced minimum size and condition restrictions in the NWHI with a "retain-all" fishery in which every lobster brought aboard is counted against the annual harvest guideline. Amendment 10, implemented in 1998, identified and described essential fish habitat for crustacean management unit species, discussed measures to minimize bycatch and bycatch mortality, and provided criteria for identifying when overfishing has occurred. In 1998, bank-specific harvest guidelines were established through a framework regulatory measure. The annual harvest guideline represents 13 percent of the exploitable population, which results in a 10 percent chance of overfishing the lobster stock at a particular permit area. In 1999, a process was established by which NMFS is authorized, in consultation with the Council, to allocate the annual harvest guideline among permit subareas (i.e. Necker Island, Gardner Pinnacles and all other NWHI lobster fishing grounds). Amendment 11 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Crustacean Management Unit Species (BMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also recommended for the NWHI, but all measures recommended in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with Executive Orders 13178 and 13196.

Precious Corals FMP

The Precious Corals FMP utilizes a combination of minimum sizes, quotas and other measures to manage potential NWHI harvests of these deep-water species (none have occurred since the Council began managing the fishery in 1983). There are several known beds of precious corals in the NWHI and the use of non-selective gear (such as dredges or tangle nets) is prohibited in all areas.

The FMP was implemented in 1983. The plan established harvest quotas for separate beds, a minimum size limit for pink coral, gear restrictions, area restrictions and fishing seasons. The FMP has been amended four times. Amendment 1, implemented in 1988, applied the management measures of the FMP to U.S. Pacific Insular Areas other than Guam, American Samoa and the Northern Mariana Islands by incorporating them into a single exploratory permit area; expanded the managed species to include any coral of the genus *Corallium*; and outlined provisions for experimental fishing permits. Amendment 2, implemented in 1991, defined a bed as overfished with respect to recruitment when the total spawning biomass (all species combined) has been reduced to 20 percent of its unfished condition. Amendment 3, implemented in 1998, established a framework procedure for adjustment of management measures. Amendment 4, implemented in 1998, identified and described essential fish habitat for managed species of precious corals, discussed measures to minimize bycatch and bycatch mortality in the precious corals fishery and provided criteria for identifying when overfishing has occurred in the fishery.

In 2002 NMFS partially approved a regulatory amendment to the FMP which prohibited the use of non-selective gear to harvest precious corals, defined live and dead corals, established minimum size limits for live pink and black corals, and suspended the harvest of gold coral at Makapu'u Bed. Additional recommendations contained in the regulatory amendment would have revised the boundaries of the NWHI Brooks Bank Bed and reduced its harvest quota for pink coral as well as suspending its quota for gold coral, designate a newly discovered bed at French Frigate Shoals (Gold Pinnacle Bed) as a conditional bed and implement a zero harvest quota for all precious corals at this bed. These recommendations were disapproved by NMFS as inconsistent with Executive Orders 13178 and 13196.

Amendment 5 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Coral Reef Ecosystems Management Unit Species (BMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also recommended for the NWHI, but all measures recommended in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with Executive Orders 13178 and 13196.

Coral Reef Ecosystems FMP

This FMP was developed to manage coral reef ecosystem associated species but was only partially implemented by NMFS. Those measures that would apply to the NWHI were disapproved as potentially in conflict with the NWHI Reserve established by President Clinton as a precursor to sanctuary designation.

The Council completed the Fishery Management Plan for Coral Reef Ecosystems of the Western Pacific Region in October of 2001. On June 14, 2002 NMFS issued a Record of Decision that partially approved the FMP. NMFS disapproved a portion of the plan that governs fishing in the NWHI because of possible conflict and duplication with Executive Orders 13178 and 13196. A final rule implementing the Coral Reef Ecosystem FMP was published on February 24, 2004 (69 FR 8336).

The FMP is the nation's first ecosystem-based plan for fisheries and includes specific measures to promote sustainable fisheries while providing for substantial protection of coral reef ecosystem resources and habitats throughout the Council's jurisdiction. The management measures of the Coral Reef Ecosystems FMP:

1. Establish a network of marine protected areas (MPA) in the Pacific Remote Island Areas (PRIA). Howland, Baker, Jarvis Islands, Rose Atoll and Kingman Reef have been designated as no-take MPAs. Palmyra, Johnston Atolls and Wake Islands are designated as low-use MPAs where fishing is allowed under special fishing permits. Both no-take and low-use MPAs were proposed for the NWHI in the FMP but disapproved by NMFS;
2. Establish a special permit and federal reporting system for controlling and monitoring the harvest of certain coral reef ecosystem MUS for which there is little or no information. Special permits are also required to fish in all areas designated as low-use MPAs. The FMP also uses data collected under existing local reporting systems to monitor the harvest of currently fished coral reef ecosystem management unit species (MUS);
3. Prohibit the use of destructive and non-selective fishing gears;
4. Prohibit harvesting of coral and live rock, but allow limited take under the special permit system for collection of seed stock by aquaculture operations, and religious/cultural use by indigenous peoples;
5. Incorporate an adaptive management approach using a framework process for rapid regulatory modifications in the event of major changes within coral reef ecosystems or coral reef fisheries;
6. Consider and take into account in management, the historical and cultural dependence of coral reef resources by indigenous people and;
7. Identify and prioritize coral reef related research needs for each island area, including socio-economic and cultural research for future potential allocation of resources.

Pelagics FMP

Under the Pelagics FMP, longlining within 50 miles of the NWHI is prohibited but other types of pelagic fishing (trolling, handlining) are allowed. Drift gillnets and shark finning are prohibited.

The Fishery Management Plan for the Pelagic Fisheries of the Western Pacific Region became effective on March 23, 1987. The Pelagic Management Unit Species at that time were billfish, wahoo, mahimahi, and oceanic sharks. The FMP's first measures prohibited drift gillnet fishing within the region's waters of the Exclusive Economic Zone and prohibited foreign longline fishing within certain areas of the EEZ.

Amendment 1 became effective on March 1, 1991 (56 FR 9686, March 7, 1991) and defined recruitment overfishing for each PMUS. It also defined the optimum yield for PMUS as the amount of fish that can be harvested by domestic and foreign vessels in the EEZ without causing local overfishing or economic overfishing.

Amendment 2 became effective on May 26, 1991 (56 FR 24731, May 31, 1991). It implemented requirements for domestic pelagic longline fishing and transshipment vessel operators to have Federal permits, to maintain Federal fishing logbooks, and, if wishing to fish within 50 nm of the Northwestern Hawaiian Islands (NWHI), to have observers placed on board if directed by the National Marine Fisheries Service (NMFS). Amendment 2 also required longline gear to be marked with the official number of the permitted vessel, and incorporated the waters of the EEZ around the Commonwealth of the Northern Mariana Islands into the area managed under the FMP.

Amendment 3, which became effective on October 14, 1991 (56 FR 52214, October 18, 1991), created a 50 nm longline exclusion zone around the NWHI to protect endangered Hawaiian monk seals. This is a contiguous area extending 50 nm from named features in the NWHI and connected by corridors between those areas where the 50-nm-radius circles do not intersect. Amendment 3 also implemented framework provisions for establishing a mandatory observer program to collect information on interactions between longline fishing and sea turtles.

Amendment 4 was effective October 10, 1991 through April 22, 1994 (56 FR 14866, October 16, 1991). It established a three-year moratorium on new entry into the Hawaii-based domestic longline fishery. The amendment also included provisions for establishing a mandatory vessel monitoring system for domestic longline vessels fishing in the Western Pacific Region.
A final rule effective December 15, 1994 (59 FR 58789, November 15, 1994) under Amendment 4 required Hawaii-based longline vessels to carry and use a NMFS-owned vessel monitoring system (VMS) transmitter to ensure that they do not fish within prohibited areas.

Amendment 5 became effective on March 2, 1992 (57 FR 7661, March 4, 1992) and created a domestic longline vessel exclusion zone around the Main Hawaiian Islands (MHI) ranging from 50 to 75 nm, and a similar 50 nm exclusion zone around Guam and its offshore banks. The zones were designed primarily to prevent gear conflicts and vessel safety issues arising from interactions between longline vessels and smaller fishing boats. A seasonal reduction in the size of the closure was implemented in October 1992; between October and January longline fishing is prohibited within 25 nm of the windward shores of all Main Hawaiian Islands except Oahu, where it is prohibited within 50 nm from the shore.

Amendment 6, which became effective on November 27, 1992 (57 FR 48564, October 27, 1992), specified that all tuna species are designated as fish under U.S. management authority and included tunas and related species as Pelagic Management Unit Species under the FMP. It also applied the longline exclusion zones of 50 nm around the island of Guam and the 25-75 nm zone around the MHI to foreign vessels.

Amendment 7 became effective on June 24, 1994 (59 FR 26979, May 25, 1994). It instituted a limited entry program for the Hawaii-based domestic longline fishery with transferable permits, a limit of 164 vessels, and a maximum vessel size of 101' in length overall.

Amendment 8 addressed new requirements under the 1996 Sustainable Fisheries Act (SFA). Portions of the amendment that were immediately approved included designations of essential fish habitat and descriptions of some fishing communities. Those provisions became effective on February 3, 1999 (64 FR 19067, April 19, 1999). Remaining portions that were approved on August 5, 2003 (68 FR 46112) were provisions regarding Hawaii fishing communities, overfishing definitions, and bycatch.

In August 2000, the State of Hawaii enacted a law prohibiting the retention or landing of shark fins without their associated carcasses (a practice called "finning"). Effective March 13, 2002 the Magnuson-Stevens Fishery Conservation and Management Act was amended with a similar nation-wide prohibition (67 FR 6194, February 11, 2002).

Framework Measure 1 became effective March 1, 2002 (67 FR 4369, January 30, 2002) and established an area seaward of 3 nm out to approximately 50 nm around the islands of American Samoa in which fishing for PMUS is prohibited by vessels greater than 50' in length overall that did not land PMUS in American Samoa under a Federal longline general permit prior to November 13, 1997.

Framework Measure 2 became effective June 13, 2002 (67 FR 34408, May 14, 2002) and incorporated the terms and conditions of a November 28, 2000 Biological Opinion issued by the U.S. Fish and Wildlife Service under section 7 of the Endangered Species Act. These measures required Hawaii-based pelagic longline vessel operators to use blue-dyed bait, strategic offal discards, and line shooters with weighted branch lines to mitigate seabird interactions when fishing north of 23° N. Also included was a requirement that all Hawaii-based longline vessel owners and operators annually attend a protected species workshop conducted by NMFS.

Regulatory Amendment 1 to the FMP became effective June 9, 2002 (67 FR 40232, June 12, 2002) and incorporated the reasonable and prudent alternative of a March 2001 Biological Opinion issued by NMFS under section 7 of the Endangered Species Act (this followed and superceded a series of emergency and interim rules issued by NMFS between December 2000 and December 2002 which arose out of litigation activities and are not itemized here). To mitigate interactions with sea turtles, this amendment prohibited shallow set pelagic longlining north of the equator by vessels managed under the FMP and closed waters between 0° and 15° N from April through May of each year to longline fishing. It also instituted sea turtle handling requirements for all vessels using hooks to target pelagic species in the region's EEZ waters. It also extended the protected species workshop requirement to include the operators of vessels registered to longline general permits.

Regulatory Amendment 2 to the FMP became effective October 4, 202 (67 FR 59813, September 24, 2002) and established Federal permit and reporting requirements for any vessel using troll or handline gear to catch PMUS in EEZ waters around the Pacific Remote Island Areas of Kingman Reef, Howland, Baker, Jarvis, Johnston and Wake Islands, and Palmyra and Midway Atolls.

Amendment 10 was prepared and transmitted to NMFS for approval in parallel with the FMP for Coral Reef Ecosystems of the Western Pacific Region. This amendment prohibits the harvest of Pelagic Management Unit Species (PMUS) in the no-take marine protected areas established under the Coral Reef Ecosystems FMP. The Coral Reef Ecosystems establishes such areas around Rose Atoll in American Samoa, Kingman Reef, Jarvis Island, Howland Island, and Baker Island. No-take areas were also proposed for the NWHI, but all measures proposed in the Coral Reef Ecosystems FMP that would have applied to the waters around the NWHI (including Midway) were disapproved because of possible conflict and duplication with the management regime of the NWHI Coral Reef Ecosystem Reserve. Accordingly, NMFS issued a Record of

Decision on June 14, 2002 that partially approved the Coral Reef Ecosystems FMP and Amendment 10 to the Pelagics FMP. A final rule implementing the Coral Reef Ecosystem FMP (including Amendment 10 to the Pelagics FMP) was published on February 24, 2004 (69 FR 8336).

Regulatory Amendment 3 implements management measures for the longline fisheries managed under the Pelagic FMP, with the objective of achieving optimum yield from these fisheries, without being likely jeopardize the long term existence of sea turtles and other listed species. The amendment established a limited model shallow-set swordfish fishery using circle hooks with mackerel bait. This hook and bait combination has been found to reduce interactions with leatherback and loggerhead turtles by 67 percent and 92 percent respectively in the U.S. Atlantic longline fishery. Fishing effort in the model shallow-set swordfish fishery is limited, in the first instance, to 50 percent of the 1994-1999 annual average number of sets, or just over 2,100 sets, allocated between those fishermen applying to participate in the fishery. As an additional safeguard a 'hard' limit on the number of leatherback (16) and loggerhead (17) turtles that could be taken by the swordfish fishery. In addition the amendment includes a number of conservation projects to protect sea turtles in their nesting and coastal habitats.

Amendment 11 established a limited access system for pelagic longlining in EEZ waters around American Samoa with initial entry criteria based on historical participation in the fishery. The final rule to implement Amendment 11 was published on May 24, 2005 (70 FR 29646).

Regulatory Amendment 4 includes a range of measures to minimize interactions with turtles by non-Hawaii based domestic longline vessels operating in the Western Pacific under general longline permits. Under this amendment, vessels with longline general permits making shallow sets north of the equator are required to use 18/0 circle hooks with mackerel-type bait and dehookers to release any accidentally caught turtles. The amendment also requires both operators and owners of vessels with general longline permits to annually attend protected species training workshops. Further, operators of vessels with general longline permits are required to carry and use specific mitigation gear to aid in the release of sea turtles accidentally hooked or entangled by longlines. These include dipnets, long-handled line clippers and bolt cutters (with allowances for boats with < 3' freeboard). This regulatory amendment also requires operators of non-longline pelagic vessels (e.g., trollers and handliners) to follow handling guidelines and remove trailing gear wherever they fish. The final rule implementing this amendment was published on November 15, 2005 (70 FR 69282).

Alternative 1B: Reserve Status Quo (No Action B)

Under this alternative, NWHI fisheries would be conducted according to the existing management measures of the above Fishery Management Plans as well as the following non-regulatory measures in place for waters between 3 and 50 miles from emergent NWHI lands which were established by Executive Order 13178 and subsequently amended by Executive Order 13196 as follow:

Executive Order 13178

Sec. 7. *Protection and Conservation Measures.* The conservation measures in this section apply throughout the Reserve.
(a) (1) *Commercial Fishing.* All currently existing commercial Federal fishing permits and current levels of fishing effort and take, as determined by the Secretary and pursuant to regulations in effect on the date of this order, shall be capped as follows:
(A) No commercial fishing may occur in Reserve Preservation Areas pursuant to section 8 of this order;
(B) There shall be no increase in the number of permits of any particular type of fishing (such as for bottomfishing) beyond the number of permits of that type in effect the year preceding the date of this order;
(C) The annual level of aggregate take under all permits of any particular type of fishing may not exceed the aggregate level of take under all permits of that type of fishing in the years preceding the date of this order, as determined by the Secretary, provided that the Secretary shall equitably divide the aggregate level into individual levels per permit, and further provided that the Secretary may make a one-time reasonable increase to the total aggregate to allow for the use of two Native Hawaiian bottomfishing permits;
(D) There shall be no permits issued for any particular type of fishing for which there were no permits issued in the year preceding the date of this order; and
(E) The type of fishing gear used by any permit holder may not be changed except with the permission of the Secretary, as provided under paragraph 3 of this section.
(2) *Recreational Fishing.* All currently existing (preceding the date of this order) levels of recreational fishing effort, as determined by the Secretary and pursuant to regulations in effect on the day of this order, shall be capped (i.e., no increase of take levels or levels of fishing effort, species targeted, or change in gear types) throughout the Reserve. However, fishing is further restricted as provided in section 8 of this order.
(3) The Secretary, after consultation with the Secretary of the Interior and Governor of the State of Hawaii, and after public review and comment and consideration of any advice or recommendations of the Reserve Council and Western Pacific Regional Fishery Management Council, may further restrict the fishing activities under subparagraphs (a)(1) and (a)(2) of this section if necessary to protect Reserve resources, or may authorize or require alternate gear types if such gear would offer equal or greater protection for Reserve resources.
(b) In addition to the conservation measures in paragraph (a) of this section, the following activities are prohibited throughout the Reserve:
(1) Exploring for, developing, or producing oil, gas, or minerals;
(2) Having a vessel anchored on any living or dead coral with an anchor, an anchor chain, or an anchor rope when visibility is such that the seabed can be seen;
(3) Drilling into, dredging, or otherwise altering the seabed; or constructing, placing, or abandoning any structure, material, or other matter on the seabed, except as an incidental result of anchoring vessels;
(4) Discharging or depositing any material or other matter into the Reserve, or discharging or depositing any material or other matter outside the Reserve that subsequently enters the Reserve and injures any resource of the Reserve, except fish parts (i.e., chumming material or bait) used

in and during authorized fishing operations, or discharges incidental to vessel use such as deck wash, approved marine sanitation device effluent, cooling water, and engine exhaust; and
(5) Removal, moving, taking, harvesting, or damaging any living or nonliving
Reserve resources, except as provided under paragraph (a) of this section and sections 8(a) and 9 of this order.
c) The Secretary may conduct, or authorize by permit the activities listed in subparagraphs (b)(3)-(5) of this section to the extent that they are necessary for research, monitoring, education, or management activities that further the Management Principles of section 4 of this order.

Sec. 8. *Reserve Preservation Areas.*
(a) To further protect Reserve resources, the following areas are hereby established as Reserve Preservation Areas until some or all are made permanent after adequate public review and comment, within which all activities referred to in paragraph (b) of this section are prohibited.
(1) From the seaward boundary of Hawaii State waters and submerged lands to a mean depth of 100 fathoms (fm) around:
(A) Nihoa Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 10fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(B) Necker Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 20fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(C) French Frigate Shoals;
(D) Gardner Pinnacles, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 10fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(E) Maro Reef, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 20fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(F) Laysan Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 50fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(G) Lisianski Island, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue seaward of a mean depth of 50fm, unless and until the Secretary determines otherwise after adequate public review and comment;
(H) Pearl and Hermes Atoll; and
(I) Kure Island.
(2) Twelve nautical miles around the approximate geographical centers of:
(A) The first bank immediately east of French Frigate Shoals;
(B) Southeast Brooks Bank, which is the first bank immediately west of French Frigate Shoals, provided that the closure area shall not be closer than approximately 3nm of the next bank immediately west;
(C) St. Rogatien Bank, provided that the closure area shall not be closer than approximately 3nm of the next bank immediately east, provided further that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue, unless and until the Secretary determines otherwise after adequate public review and comment;

(D) The first bank west of St. Rogatien Bank, east of Gardner Pinnacles;
(E) Raita Bank; and
(F) Pioneer Bank, provided that bottomfishing in accordance with the requirements of section 7(a)(1) of this order shall be allowed to continue, unlessand until the Secretary determines otherwise after adequate public review and comment.
(b) Activities Prohibited Within Reserve Preservation Areas.
(1) In addition to the conservation measures in section 7 of this order, which are applicable to the entire Reserve, the following activities are prohibited within the Reserve Preservation Areas listed in paragraph (a) of this section, except as expressly otherwise stated in this paragraph and sections (8)(a) and 9 of this order:
(A) Commercial and recreational fishing;
(B) Anchoring in any area that contains available mooring buoys, or anchoring outside an available anchoring area when such area has been designated by the Secretary;
(C) Any type of touching or taking of living or dead coral;
(D) Discharging or depositing any material or other matter except cooling water or engine exhaust; and
(E) Such other activities that the Secretary identifies after adequate public review and comment, and after consideration of any advice and recommendations of the Reserve Council.
(2) Notwithstanding the prohibitions in this paragraph, the Secretary may conduct, or authorize by permit, research, monitoring, education, or management activities within any Reserve Preservation Area that further the Management Principles of section 4 of this order.
(3) The Reserve Preservation Areas in this section are approximated using fathoms. The Secretary will develop straight line boundaries based on longitude and latitude coordinates to encompass each Reserve Preservation Area, to provide for clarity and ease of identification. The Secretary may make technical modifications to any such boundaries.

Sec. 9. *Native Hawaiian Uses.* Native Hawaiian noncommercial subsistence, cultural, or religious uses may continue, to the extent consistent with existing law, within the Reserve and Reserve Preservation Areas identified under section 8 of this order. The Secretary shall work with Native Hawaiian interests to identify those areas where such Native Hawaiian uses of the Reserve's resources may be conducted without injury to the Reserve's coral reef ecosystem and related marine resources and species, and may revise the areas where such activities may occur after public review and comment, and consideration of any advice and recommendations of the Reserve Council.

Executive Order 13196

Sec. 3. *Amendments to Sections 7 of Executive Order 13178.*
1. Section 7(a)(1) of Executive Order 13178 is hereby amended by revising the first sentence to read as follows:
''Commercial Fishing. All currently existing commercial Federal fishing permits and current levels of fishing effort and take, which also includes the non-permitted level of trolling for pelagic species by currently permitted bottom fishers, as determined by the Secretary and pursuant to regulations in effect on December 4, 2000, shall be capped as follows:''
2. Section 7(a)(1)(C) of Executive Order 13178 is hereby revised to read as follows:

‘‘(C) The annual level of aggregate take under all permits of any particular type of fishing may not exceed the aggregate level of take under all permits of that type of fishing as follows:
(1) Bottomfishing—the annual aggregate level for each permitted bottomfisher shall be that permittee’s individual average taken over the 5 years preceding December 4, 2000, as determined by the Secretary, provided that the Secretary, in furtherance of the principles of the reserve, may make a onetime reasonable increase to the total aggregate to allow for the use of two Native Hawaiian bottomfishing permits;
(2) All other commercial fishing—the annual aggregate level shall be the permittee’s individual take in the year preceding December 4, 2000, as determined by the Secretary.’’
3. A new section 7(a)(1)(F) is hereby added to Executive Order 13178 and reads as follows:
‘‘(F) Trolling for pelagic species shall be capped based on reported landings for the year preceding December 4, 2000.’’
4. Section 7(b)(4) is revised to read as follows:
‘‘(4) Discharging or depositing any material or other matter into the Reserve, or discharging or depositing any material or other matter outside the Reserve that subsequently enters the Reserve and injures any resource of the Reserve, except:
(A) fish parts (i.e., chumming materia or bait) used in and during fishing operations authorized under this order;
(B) biodegradable effluent incident to vessel use and generated by a marine sanitation device in accordance with section 312 of the Federal Water Pollution Control Act, as amended;
(C) water generated by routine vessel operations (e.g., deck wash down and graywater as defined in section 312 of the Federal Water Pollution Control Act), excluding oily wastes from bilge pumping; or (D) cooling water from vessels or engine exhaust; and’’.

Sec. 4. *Amendments to Sections 8 of Executive Order 13178.*
1. Section 8 of Executive Order 13178 is modified by substituting ‘‘provided that commercial bottomfishing and commercial and recreational trolling for pelagic species in accordance with the requirements of sections 7(a)(1) and 7(a)(2) of this order, respectively,’’ for ‘‘provided that bottomfishing in accordance with the requirements of section 7(a)(1)’’ everywhere the latter phrase appears in section 8.
2. Section 8(a)(1)(A) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 10fm.’’
3. Section 8(a)(1)(B) is modified by substituting ‘‘a mean depth of 25 fm’’for ‘‘a mean depth of 20fm.’’
4. Section 8(a)(1)(D) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 10fm.’’
5. Section 8(a)(1)(E) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 20fm.’’
6. Section 8(a)(1)(G) is modified by substituting ‘‘a mean depth of 25 fm’’ for ‘‘a mean depth of 50fm.’’
7. Section 8(a)(1)(I) is revised to read ‘‘Kure Atoll.’’
8. Sections 8(a)(2)(D) and (E) are hereby deleted and a new section 8(a)(3) is hereby substituted as follows:
‘‘(3) Twelve nautical miles around the approximate geographical centers of

(A) The first bank west of St. Rogation Bank, east of Gardner Pinnacles, provided that commercial bottomfishing and commercial and recreational trolling for pelagic species in accordance with the requirements of sections 7(a)(1) and 7(a)(2) of this order, shall be allowed to continue for a period of 5 years from the date of this order; and
(B) Raita Bank, provided that commercial bottomfishing and commercial and recreational trolling for pelagic species in accordance with the requirements of sections 7(a)(1) and 7(a)(2) of this order, shall be allowed to continue for a period of 5 years from the date of this order; and
(C) Provided that both banks described above in (3)(A) and (3)(B) shall only continue to allow commercial bottomfishing and commercial and recreational trolling for pelagic species after the 5-year time period if it is determined that continuation of such activities will have no adverse impact on the resources of these banks.''

Alternative 2: Limited NWHI Sanctuary Fishing

Alternative 2 includes three aspects that address each of the regulatory regimes currently under consideration by NOAA for the proposed NWHI sanctuary. The first would allow limited fishing activities within the proposed sanctuary to continue indefinitely, the second would end such fishing by 2025, and the third would end it after five years following the (yet to be determined) effective date of the NWHI sanctuary designation. The first two variations include catch levels and permit limits for the proposed sanctuary. For the five year variation, the number of permits would be limited to those permits active at the time of designation.

Under all three scenarios, NWHI fisheries for crustaceans, precious corals and coral reef associated species would be subject to moratoriums on all harvests within a corridor that is 50 nautical miles from the geographic center of each of individual islands in the NWHI (i.e. throughout the proposed NWHI sanctuary, see Figure 13).

Also under all three scenarios, commercial fishing for NWHI bottomfish would continue to be managed under those limited access programs described in Alternative 1A. NWHI commercial bottomfish fishing permits would be non-transferable and if relinquished by the permit holder, would be reissued without delay by NMFS in accordance with the procedures set forth for the Ho'omalu Zone in Section 660.61 of the Code of Federal Regulations, and for the Mau Zone as described in an amendment to the Bottomfish FMP that has been recommended by the Council to establish a similar process to reissue Mau Zone permits that have been relinquished or revoked. Permit holders would not be subject to minimum landing requirements but would be required to maintain federal MSA logbooks.

Also included in all scenarios is the implementation of eligibility criteria for two Mau Zone limited access permits set aside under the Western Pacific Community Development Program for the use of indigenous communities. These would be allocated and managed as described in an amendment to the Bottomfish FMP that has been recommended by the Council.

Under all three scenarios, commercial fishing for pelagic species would continue to be allowed within the proposed sanctuary by use of trolling or handline hook-and-line gear, with longline, trawls, purse seines, and set nets prohibited. These pelagic fishing vessels would be subject to new federal MSA permitting and logbook requirements.

Finally, under all three scenarios all recreational (i.e. non-commercial) fishery participants within the proposed sanctuary would be subject to new federal MSA permitting and logbook requirements. The one exception would be Midway-based recreational fishing that takes place within a 12 mile circle surrounding Midway Atoll. These operations would be subject to the federal MSA permitting requirement but would otherwise continue to be managed by the U.S. FWS, who would collect fishery monitoring data and share it with NMFS.

Scenario 1: Allow Limited NWHI Sanctuary Fishing Indefinitely

In addition to the measures common to all scenarios that are described above, under Scenario 1 federal MSA catch and permit limits would be implemented for all commercial NWHI fishery participants targeting bottomfish or pelagic species within the proposed NWHI sanctuary.

The number of permits available at any one time for commercial bottomfish fishing would be limited to seven for the Mau Zone (including two CDP permits) and seven for the Ho'omalu Zone. The total fleet-wide catch of bottomfish by these permit holders would be capped at 381,500 pounds per year. Based on the non-confidential data shown in Figure 14, the average annual NWHI catch per vessel by non-longline commercial pelagic fishing vessels over the entire time series is about 5,600 lb per permit, based on the data where both catch and permit data pairs available. Thus this sector's total fleet-wide catch of pelagic fish would be capped at 78,400 pounds per year.

Recreational (i.e. non-commercial) fishery participants would be required to obtain annual federal MSA permits which would be issued on a case-by-case basis for no more than two years at which time the appropriate level of NWHI sanctuary recreational fishing catch and effort would be determined and capped.

A range of options are being considered under this scenario regarding the number of permits and catch limits for commercial non-longline pelagic fishing (by participants other than bottomfish permit holders) within the proposed NWHI sanctuary. These are discussed in Section 3.3.4.

Three options are being considered for the establishment of no-take MPAs in the NWHI under this scenario. These are discussed in Section 3.3.5.

Scenario 2: Allow Limited NWHI Sanctuary Fishing Until 2025

In addition to the measures common to all scenarios that are described above, under Scenario 2 federal MSA catch and permit limits would be implemented for all commercial NWHI fishery participants targeting bottomfish or pelagic species within the proposed NWHI sanctuary.

The number of permits available at any one time for commercial bottomfish fishing would be limited to seven for the Mau Zone (including two CDP permits) and seven for the Ho'omalu

Zone. The total fleet-wide catch of bottomfish by these permit holders would be capped at 381,500 pounds per year. Their total fleet-wide catch of pelagic fish would be capped at 78,400 pounds per year.

Recreational (i.e. non-commercial) fishery participants would be required to obtain annual federal MSA permits which would be issued on a case-by-case basis for no more than two years at which time the appropriate level of NWHI sanctuary recreational fishing catch and effort would be determined and capped.

A range of options are being considered under this scenario regarding the number of permits and catch limits for commercial non-longline pelagic fishing (by participants other than bottomfish permit holders) within the proposed NWHI sanctuary. These are discussed in Section 3.3.4.

Three options are being considered for the establishment of no-take MPAs in the NWHI under this scenario. These are discussed in Section 3.3.5.

Effective December 31, 2024, no fishing of any type would be allowed in the corridor that is 50 nautical miles from the geographic center of each of individual islands in the NWHI (i.e. throughout the proposed NWHI sanctuary, see Figure 13).

Scenario 3: Allow Limited NWHI Sanctuary Fishing for Five Years

In addition to the measures common to all scenarios that are described above, under Scenario 3 the number of permits available at any one time for commercial bottomfish fishing would be limited to those active as of the effective date of the NWHI sanctuary designation.

Commercial and recreational fishing for pelagic species, as well as recreational fishing for bottomfish, would continue to be regulated as described in Section 660 of the Code of Federal Regulations.

Effective five years from the effective date of the final rule implementing the designation of the NWHI sanctuary, no fishing of any type would be allowed in the corridor that is 50 nautical miles from the geographic center of each of individual islands in the NWHI (i.e. throughout the proposed NWHI sanctuary, see Figure 13).

These measures are summarized in Table 8.

Table 8: Summary of Measures for Each Scenario under Alternative 2

Measure	Scenario 1	Scenario 2	Scenario 3
MORATORIUMS			
Moratoriums on crustacean, precious corals and coral reef ecosystem fisheries	X	X	X
COMMERCIAL BOTTOMFISHING			
Cap permits and landings	X	X	
Implement CDP program	X	X	X
Require federal logbooks	X	X	X
COMMERCIAL PELAGIC FISHING			
Cap permits and landings	X	X	
Require federal permits and logbooks	X	X	X
RECREATIONAL FISHING			
Allow case-by-case, cap after two years	X	X	
Require federal permits and logbooks	X	X	X
NO-TAKE MPAS			
Implement no-take MPAs	X	X	

Options for the NWHI Commercial Pelagic Fishery

The following options are being considered under Scenarios 1 and 2 for the commercial non-longline pelagic fishery sector in the proposed NWHI sanctuary. Due to the use of confidential, unpublished fishery landings data in the calculation of some catch and permit limits, some options are necessarily vague in their presentation here.

No Action

Under this option, no new limits would be placed on non-longline commercial pelagic fishing vessels in the proposed NWHI sanctuary and catches would continue to be monitored by the completion of catch reports required of commercial marine license holders by the by the State of Hawaii.

Limit of Three or Less Pelagic Permits, and Total Pelagic Catch of Less Than or Equal to 50,000 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be limited to approximately

50,000 lb or less, and the number of non-longline commercial pelagic fishing vessels would be capped at three or less permits.

Limit of Three or Less Pelagic Permits and Total Pelagic Catch of Less Than or Equal to 70,500 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be limited to approximately 70,500 lb or less, and the number of non-longline pelagic fishing vessel permits would be capped at three or less permits.

Limit of 15 Pelagic Permits and Total Pelagic Catch of 213,635 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be limited to approximately 213,635 lb, and the number of non-longline pelagic fishing vessel permits would be capped at 15 or less permits.

From the long-term data set for non-longline commercial pelagic fishing vessels, the maximum number of these permits operating in the NWHI was 15 in 1987, with a corresponding catch of 213,653 lb. While this alternative does not aspire to closely match the intent of EO 13196, it still places stringent limits on the volume of pelagic fish catches in the NWHI, while being based on historic levels of participation and fishing activity in this section of the Hawaiian Archipelago. Although this level of fishing for pelagic fishes may be higher than contemplated in the EO and by the proposed marine sanctuary, this level of fishing activity appears to have had no impacts on the populations of coral reef associated species in the NWHI. This alternative would allow realistic opportunities for Hawaii-based fishermen to fish for pelagic fishes in the NWHI,

Limit of 7-10 Pelagic Permits and Total Pelagic Catch of 219,386 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary non-longline commercial pelagic fishing vessels would be limited to approximately 219,386 lb, and the number of non-longline commercial pelagic fishing vessel permits would be capped at between 7-10 permits.

Clearly, this option is also markedly less stringent than the intent of EO, but as with the previous option, it is based on historical trends within the NWHI fisheries and incorporates longline catches in terms of non-longline pelagic permit equivalents.

Limit of 22 Pelagic Permits and Total Pelagic Catch of 386,124 lb

Under this option, the volume of pelagic fish which could be caught in the proposed NWHI sanctuary by non-longline commercial pelagic fishing vessels would be capped at 386,124 lb, and the number of non-longline pelagic fishing vessel permits would be capped at 22 permits.

Both this and the next option factor in catches by the non-longline pelagic fishing vessels and the equivalent volume of fish represented by longline fishing which occurred historically within the bounds of the proposed marine sanctuary. The average annual longline catch of pelagic fish from the waters of the proposed NWHI sanctuary between 1990 and 1991 amounted to 172,471 lbs.

This option maximizes the potential pelagic catch from the NWHI for non-longline commercial pelagic fishing vessels, by incorporating the historic maximum catch by these vessels and accounting for pelagic longline catch as the equivalent production by the for non-longline pelagic fishing vessels. Clearly, this option is markedly less stringent than the intent of EO, but places pelagic fish catches from the waters of the proposed sanctuary within historical limits, and affords Hawaii fishermen opportunities to target pelagic fish in the NWHI.

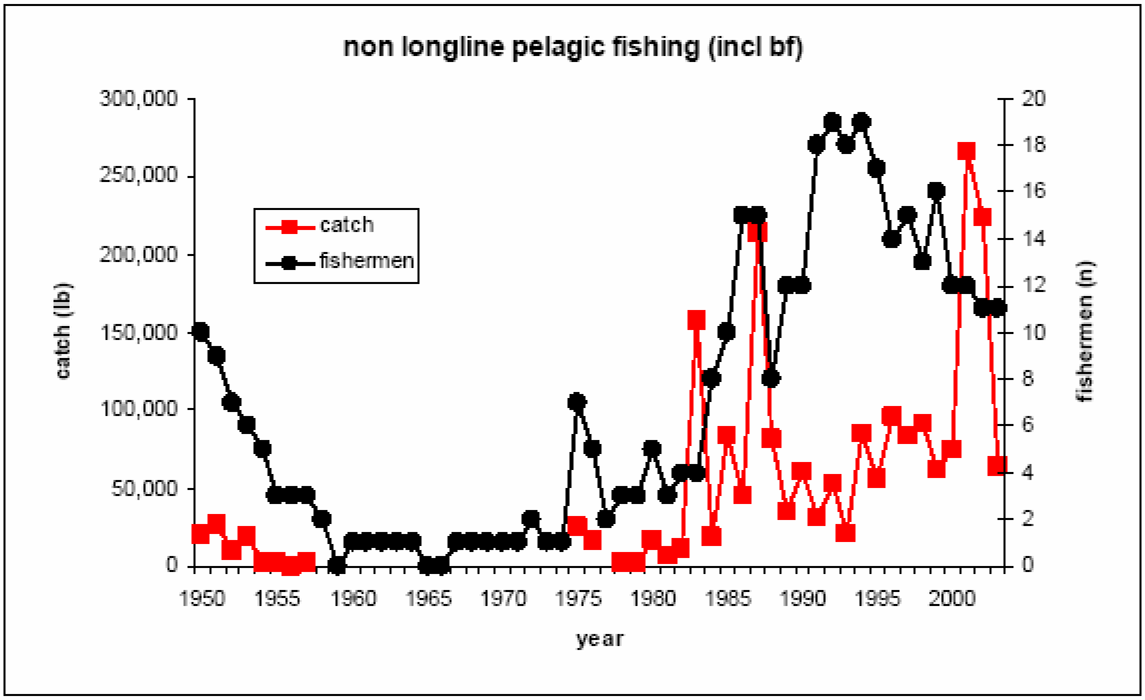
These options are summarized in Table 9:

Table 9: Options for Non-longline Commercial Pelagic Fisheries in the NWHI

Option	Action
1	No action
2	Less than or equal to 3 pelagic permits, and total pelagic catch limit of less than or equal to 50,000 lbs
3	Less than or equal to 3 pelagic permits and total pelagic catch limit of less than or equal to 70,500 lbs
4	Limit of 15 pelagic permits and total pelagic catch limit of 213,653 lb
5	Limit of 7-10 pelagic permits and total pelagic catch limit of 219,386 lb
6	Limit of 22 pelagic permits and total pelagic catch limit of 386,124 lb

These options are based for the most part on data from logbooks and logsheets for Hawaii-based commercial pelagic vessels operating within the proposed sanctuary. The logbook records for the troll/handline fisheries extend from the early 1950s to the present and are collected by the State of Hawaii's Division of Aquatic Resources as one of the requirements for a commercial marine license to fish. By contrast, federal logbooks for the Hawaii-based longline fishery were only implemented in 1990. Although records for the longline fishery extend from 1990 to the present, records of longline fishing within the confines of the proposed 50 nm sanctuary boundary around the NWHI is restricted to 1990 and 1991. This is due to the 50 nm protected species zone from which longliners are excluded and which was implemented by the Council under its Pelagics FMP in late 1991 to avoid the accidental capture of Hawaiian monk seals. The proposed sanctuary conforms exactly to coordinates used to delineate the protected species longline exclusion zone.

A summary of the non-confidential commercial catch data used top develop the alternatives in Table 9 is given in Figures 14 and 15. Figure 14 illustrates non-confidential NWHI pelagic catches and participants on bottomfish and non-longline pelagic vessels combined (top), and on pelagic fishing vessels only (bottom). Figure 15 illustrates the species composition of NWHI pelagic catches by non-longline pelagic and bottomfishing vessels combined (top), by non-longline pelagic fishing vessels only (middle) and by longline vessels only (bottom). Data for bottomfish and non-longline pelagic vessels extends from 1950 to 2003, and for longliners from 1990 to 1991.



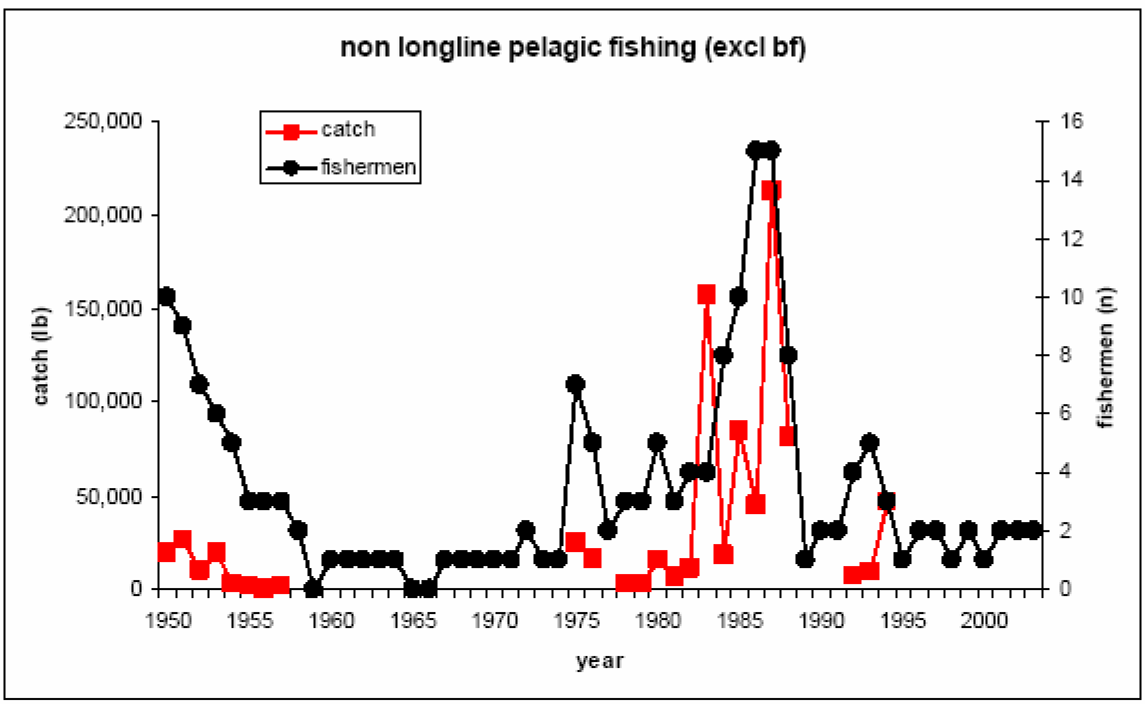


Figure 14: Time Series of Catch Records for NWHI Commercial Pelagic Catches

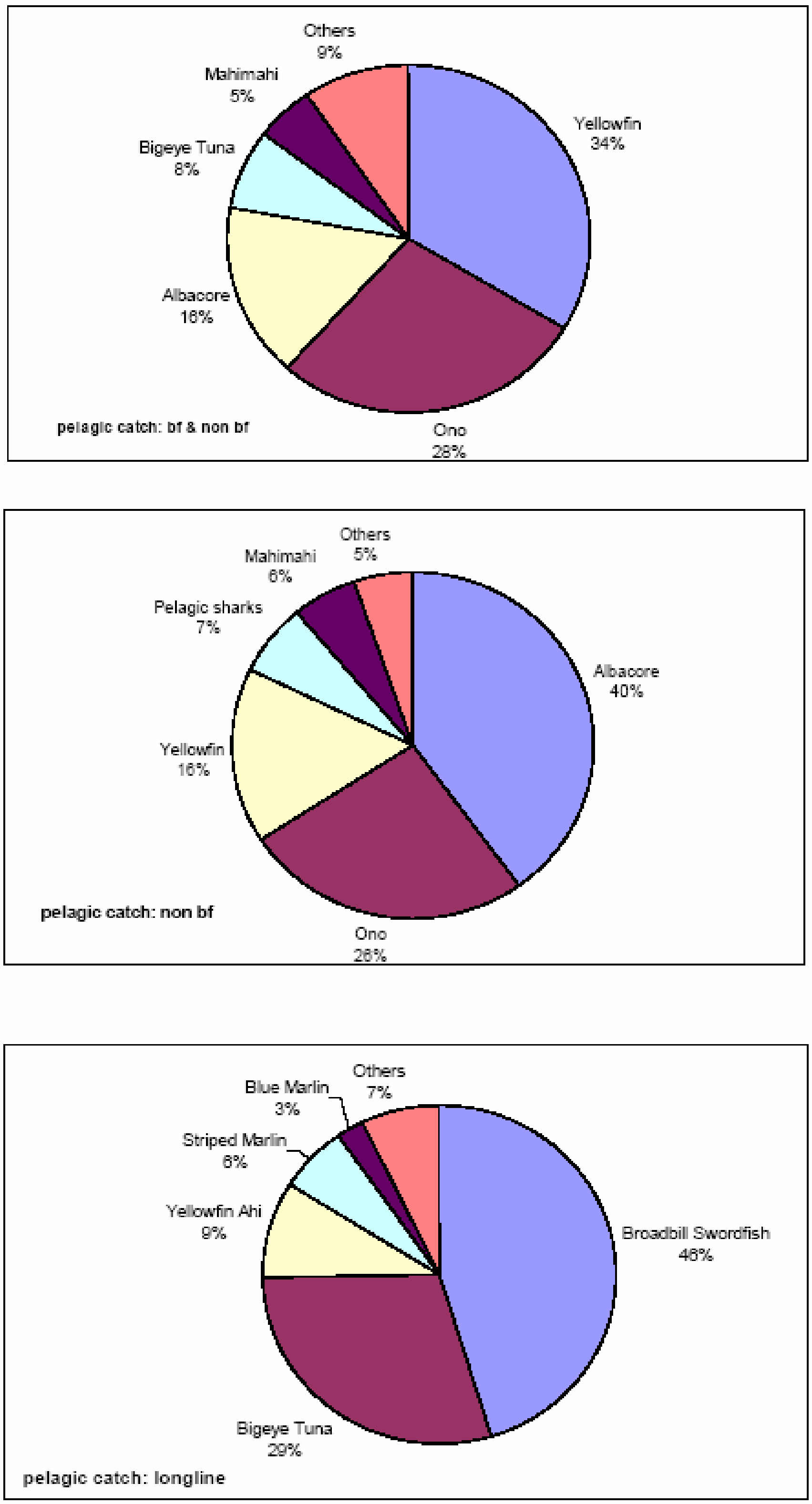


Figure 15: Species Composition of NWHI Commercial Pelagic Catches

The data in Fig. 20 show that the aggregate number of commercial bottomfish and non-longline pelagic fishermen increased markedly after the mid-1970s and reached a peak of about 19 fishermen by the early 1990s with a decline thereafter. Most of this increase was due to bottomfish vessels, apart from a period in the mid-1980s when non-longline pelagic fishermen numbers in the NWHI peaked at 15 fishermen. Numbers since then have been considerably lower, alternating between 1-2 fishermen per year since 1995. Catch composition for commercial pelagic fisheries operating in the NWHI is shown in Figure 15. The combined pelagic catch for bottomfish and non-longline pelagic vessels shows that catches were dominated by yellowfin, ono (wahoo) and albacore tuna, which formed almost 80 percent of catches. The same three species also comprise about 80 percent of the catch composition of non-longline pelagic vessels, although albacore rather than yellowfin is the largest component of the catch. Catches of albacore by the non-longline pelagic vessels is not evenly distributed through the records form the non-longline pelagic fishing vessels, and the dominance of this species in the data is due to large catches of this species in 1983, 1985 and 1987, with no other landings reported in any of the other years. The catch composition for the longline fishery is dominated by swordfish, which forms almost 50 percent of the catch, followed by bigeye tuna and yellowfin tuna, and reflects the targeting of the longline fishery for these species, fishing shallow for swordfish or deep for bigeye tuna.

It is important to note that the data discussed in the previous sections, although extensive, is incomplete for a number of years due to confidentiality protocols for catches by less than three fishing entities. This makes interpretation of the data for non-longline pelagic fishing vessels somewhat difficult, since catches for 27 years out of the total time series of 53 years have no catch reports, although one or two fishermen may have fished within those years. Consequently, a combination of average and maximum values were used to develop the options shown in Table 9. As described above, under some options, the historical longline catches in 1990 and 1991 have been factored in to generate upper limits for the number of pelagic permits and catches, by expressing this volume of catch as the equivalent that might be caught by non-longline pelagic fishing vessels.

Options for No-take MPAs under Scenarios 1 and 2

The following options are being considered under Scenarios 1 and 2 for no-take MPAs in the proposed NWHI sanctuary. No fishing of any type would be allowed in these areas (with the exception of Midway-based recreational fishing and federally permitted research activities as described above.

No Action

Under this option, no no-take MPAs would be established in the proposed NWHI sanctuary.

Option A

Under this option, no-take MPAs would be established as illustrated in Figure 16 utilizing the smaller area closure shown in the north (west of 174 W. longitude). No fishing of any type would be allowed within these areas, with the exception of federally permitted research activities and Midway-based recreational fishing as described above.

Option B

Under this option, no-take MPAs would be established as illustrated in Figure 16 utilizing the larger area closure shown in the north (west of 177 W. longitude). No fishing of any type would be allowed within these areas, with the exception of federally permitted research activities and Midway-based recreational fishing as described above.

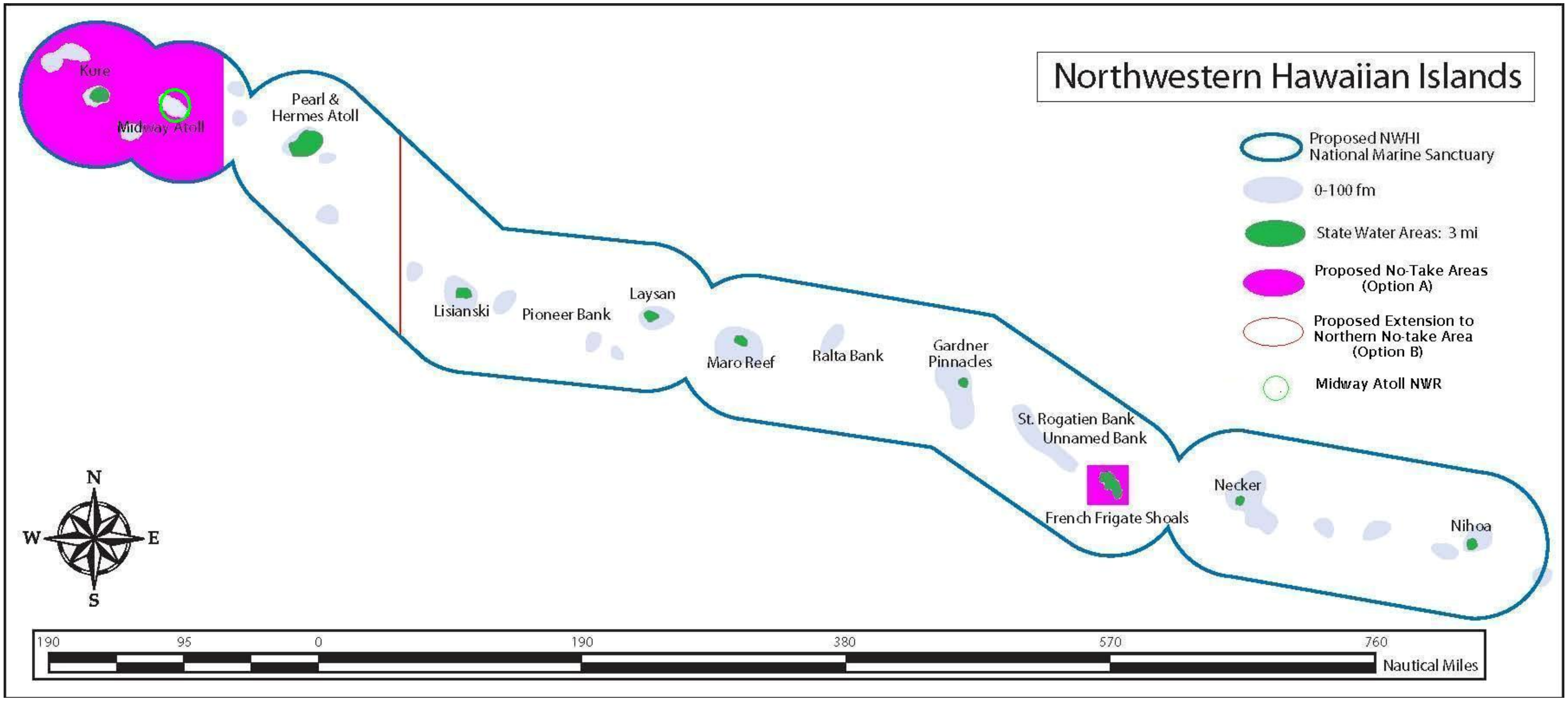


Figure 16: Potential NWHI No-take MPAs

<u>Proposed No-Take Areas Option A</u>

1. No-Take Area West of 174 º long. (except at Midway Atoll)
2. No-Take around French Frigate Shoal
   Point A: 24 º 0’ N lat; 167 º 40’ W. long
   Point B: 24 º 0’ N lat; 166 º 0’ W. long
   Point C: 23 º 30’ N lat; 167 º 40’ W. long
   Point D: 23 º 30’ N lat; 166 º 0’ W. long

<u>Proposed No-Take Areas Option B:</u>

Same as Option A except, extend No-Take Area to West of 177 º long (except at Midway Atoll)

Alternative 3: Preliminarily Preferred Alternative

The measures indicated under Alternative 3 were developed by the Council in consideration of NOAA's policy and "sideboards" for the proposed NWHI sanctuary (13 bottomfishing permits with a total annual catch of approximately 350,000 lbs, and 2 pelagic permits with a total annual catch of approximately 180,000 lbs). The National Marine Sanctuaries Act, as well as the proposed goals and objectives for the proposed NWHI sanctuary and other information in the NMSP's September 4, 2004 *"Proposed Northwestern Hawaiian Islands National Marine Sanctuary Advice and Recommendations on Development of Draft Fishing Regulations Under the National Marine Sanctuaries Ac Section 304(a)(5)"* have also been considered, as have the two EOs that implemented the NWHI Coral Reef Reserve. In addition, the principles, purposes and policies of the Magnuson Stevens Act and other applicable laws have been considered, as has the rationale provided by NOAA for its disapproval of the Council's April 14, 2005 recommendation. The measures recommended here are believed to be consistent with the directives above as appropriate.

Alternative 3 was developed and adopted by the Council at their 131st meeting held March 13-16 in Honolulu Hawaii. The new regulatory features of this alternative (below) would apply under scenario 1 (allow limited NWHI fishing indefinitely) and scenario 2 (allow limited NWHI fishing until 2025). Under scenario 3 current regulations would remain in place without change except for the requirements for federal MSA permits and reporting.

Under Alternative 3, limited fishing would be allowed in federal waters of the proposed NWHI National Marine Sanctuary and managed under the Magnuson-Stevens Act (except for recreational fishing at Midway Atoll), implemented through MSA codified federal regulations and subject to the following restrictions:

12. A closure be established indefinitely for all harvests of crustacean, precious coral and coral reef ecosystem species;
13. All commercial and recreational fishing be subject to Magnuson-Stevens Act permit and logbook reporting requirements;
14. Recreational fishing permits be issued on a case-by case basis, and that the Council will evaluate the need for further management.
15. Limited-entry NWHI bottomfish permits be capped at 14, with 7 permits for the Ho'omalu Zone and 7 permits for the Mau Zone (the two Community Development Program permits for indigenous use to be included in the latter and issued as previously recommended by the Council);
16. The annual bottomfish catch be limited to 381,500 lbs (85 percent of MSY);
17. Non-longline commercial pelagic fishing permits be capped at three (3);
18. The annual commercial pelagic catch by the non-longline pelagic fishery and the limited-entry bottomfish fishery be limited to 180,000 lbs.;
19. No-take MPAs be established around French Frigate Shoals and West of 174° W longitude;
20. The use-or-lose requirements for renewal of commercial bottomfish permits be removed;

21. Relinquished or revoked commercial bottomfish permits be reissued by NMFS in accordance with the existing procedures for Ho'omalu Zone permits and as described in the Council's previous recommendation for Mau Zone permits.
22. Federally permitted research regarding fishery and ecosystem conservation and management would be allowed in Federal waters .

Note: the above catch limits for bottomfish and pelagic species are not species or vessel specific and are not intended to be quotas or hard limits but would rather be "checkpoints" that, if reached, would prompt fishery scientists and the Council to examine whether further additional management measures were needed.

In addition, the Council recommended that NMFS work with the USFWS and request the USFWS to:

a. Apply the same data reporting protocols that NMFS uses in collecting fishery dependent data;
b. Accurately collect and maintain all non-commercial fishing data collected on Midway Atoll

The Council also recommended that Native Hawaiian subsistence and sustenance use of NWHI fishery resources be allowed and managed in federal waters of the proposed NWHI National Marine Sanctuary under the National Marine Sanctuaries Act, and that NMFS work with the NMSP to ensure that all catch data is collected so it can be incorporated into NMFS' ecosystem assessments and monitoring of stock sustainability.

Finally, the Council recommended that harvests of NWHI fishery resources by permitted research, enforcement and management (e.g. marine debris clean up vessels and sanctuary "management vessels") vessels for on-board consumption (i.e. sustenance) be allowed and managed in federal waters of the proposed NWHI National Marine Sanctuary under the National Marine Sanctuaries Act, and that NMFS work with the NMSP to ensure that all catch data is collected so it can be incorporated into NMFS' ecosystem assessments and monitoring of stock sustainability.

Skills Necessary to Meet Compliance Requirements

No special skills would be required to comply with the proposed requirements associated with the alternatives under consideration here. The major new requirement (other than fishery closures) would be the implementation of federal MSA permit and reporting requirements for NWHI fisheries. These forms are not considered to be especially onerous to complete and are discussed in section 5.8 (Paperwork Reduction Act) of the main body of this document.

Identification of Duplicating, Overlapping, and Conflicting Federal Rules

To the extent practicable it has been determined that there are no Federal rules that duplicate, overlap, or conflict with the alternatives considered here.

Description of Small Businesses to Which the Rule Would Apply

The alternatives considered here would potentially apply to historic, current, and potential NWHI fishery participants, support industries, wholesalers, retailers and restaurants. There are currently eight active fishing operations in the bottomfish fishery, and two other fishing operations in the pelagic fishery. These vessels are serviced by numerous support industries ranging from fuel and bait suppliers to mechanics and electronic technicians. The majority of landings from these vessels are generally sold to wholesalers and retailers via Honolulu's United Fishing Agency. From there they make their way to local, U.S. mainland, and foreign retailers and consumers. With the exception of the United Fishing Agency, all Hawaii-based operations are believed to be small businesses; that is, they have gross revenues of less than $3.5 million annually, they are independently owned and operated, and they are not dominant in their field.

Economic Impacts of the Alternatives on Small Businesses

This section presents a summary of the anticipated direct impacts of the above alternatives on potentially affected fishery participants, as well as their indirect impacts on fishery suppliers and marketers. Because many measures are considered under more than one alternative (e.g. closure of the precious corals fishery), these analyses are presented by their commonalities across alternatives as shown in Table 10.

Table 10. Overview of Fishery Measures under Each Alternative

	Alt. 1A	Alt. 1B	Alt. 2			Alt. 3
Fishery			Scenario 1	Scenario 2	Scenario 3	
Bottomfish	Open	Closed	Open	Closed	Closed	Open
Pelagics	Open	Closed	Open	Closed	Closed	Open
Coral Reef Ecosystem	Open	Closed	Closed	Closed	Closed	Closed
Crustaceans	Closed	Closed	Closed	Closed	Closed	Closed
Precious Corals	Open	Closed	Closed	Closed	Closed	Closed

Impacts of Continued Limited Fishing Alternatives

Under Alternatives 1A, Alternative 2's Scenario 1, and Alternative 3, limited commercial and recreational fishing would continue to be allowed indefinitely within the proposed NWHI sanctuary. The anticipated impacts of these continued fisheries are discussed below.

Under these alternatives impacts on NWHI fisheries and fishery participants are anticipated to remain generally unchanged. Applicable fisheries would continue to be managed under their respective fishery management plans and no new measures affecting fishery operations would be implemented. However renewal of the crustacean or precious corals fisheries would provide access to controlled fishery harvests with associated benefits to fishery participants. The currently available unregulated access to coral reef ecosystem resources could lead to conservation problems if this fishery were to expand. However given experience to date this is unlikely in the near- term as there has been little interest in this remote fishing area, and the majority of coral reef ecosystem species occur within state waters which are now closed to fishing except with a special permit.

Under these alternatives current impacts on fishery support industries and marketers are anticipated to remain unchanged. Fisheries would continue to be managed under their respective fishery management plans and no new measures would be implemented. However renewal of the crustacean or precious corals fisheries would provide access to controlled fishery harvests with associated benefits to fishery supply and marketing industries.

The historical contribution of NWHI fisheries to Hawaii's economy is small. However, given the vulnerability of the economies of Hawaii and other U.S. Pacific Islands to sharp and sudden economic downturns, as evidenced by negative changes in the economic condition of most of these island areas during the past several years, the importance of economic diversification is apparent. Commercial fishing appears to be one of the few economic sectors outside the mainstay of tourism in which substantial economic growth is possible.

Impacts of Fishery Closure Alternatives

All alternatives contain some fishery closures (see Table 10). The impacts of these closures are discussed below.

Under all alternatives long-run impacts on one or more fisheries and fishery participants are anticipated to be adverse as applicable fisheries would be closed over a time span of approximately 5-20 years.

Bottomfish fishery participants that will be forced to leave the fishery under Alternative 1B and Alternative 2's scenarios 2 and 3 will face a loss of livelihood and income and are likely to experience feelings of anger and frustration as they believe their fishery to be responsible and highly regulated and having no adverse impacts on NWHI marine resources. Some participants may relocate to fish in the MHI bottomfish fishery but given the stresses on this fishery it may be difficult for them to achieve catch rates or revenues comparable to those in the NWHI. This additional MHI effort may also negatively impact current MHI fishery participants as catch competition may further reduce MHI catch rates. These alternatives would also foreclose the opportunity for future harvests of NWHI bottomfish. It is possible that closed areas could serve as reservoirs to help augment stocks in surrounding fishing grounds and increase harvests, thereby mitigating the revenue reductions from fishing restrictions. However, the ability of closed areas to increase yields has not been demonstrated for bottomfish fisheries in Hawaii. It should also be noted that, even if a closed area has the potential to have a positive effect on fish populations and fishery productivity, it may take several years after the implementation of area closures for this effect to be realized in bottomfish because of the high age of first reproduction for most bottomfish species. Given this time lag, it is unlikely that the potential economic benefits of area closures would accrue to the current (and under these alternatives, likely the last) generation of bottomfish fishermen.

Alternative 1B and Alternative 2's scenarios 2 and 3 would also close the pelagic fishery over approximately 5-20 years. Impacts on historical and potential participants in this fishery would be similar to those described above for bottomfish participants. These alternatives would also foreclose the opportunity for future harvests of pelagic resources with their associated benefits to fishery participants.

All alternatives would also close the NWHI crustacean, precious corals, and coral reef ecosystem fisheries - under Alternative 1A, a de facto closure of the crustacean fishery would remain in place as described above. Impacts on historical and potential participants in these fisheries would be similar to those described above for NWHI bottomfish participants. Obviously the loss of potential income from the unfished precious corals and coral reef fisheries will be easier to bear than the loss of historical income from the lobster fishery, however all groups are likely to be angry and frustrated at the closure of fisheries which they believe to be responsible and carefully regulated and unlikely to adversely impact NWHI marine resources. These alternatives would also foreclose the opportunity for future harvests of NWHI crustaceans, precious corals, and coral reef ecosystem resources with their associated benefits to fishery participants.

Closure of various fisheries under the alternatives is anticipated to have adverse impacts on fishing related economic activities. Applicable fisheries would be closed over a time span of approximately 5-20 years. As these vessels leave the fishery, revenues to fishery supply shops, fuel, ice, bait and other vendors as will revenues to wholesalers, retailers and other fish marketers will be reduced and then eliminated (see Table 6). In addition these alternatives would also foreclose the opportunity for future harvests of some or all NWHI resources with their associated benefits to fishing related economic activities. Impacts on support industries for dormant or unfished fisheries would be foregone future opportunities rather than reductions in current revenues.

Alternative 1B and Alternative 2's scenarios 2 and 3 would also close the NWHI pelagic fishery over approximately 5-20 years. Impacts on historical and potential participants in this fishery would be similar to those described above for NWHI bottomfish fishery participants.

All alternatives would also close the NWHI crustacean, precious corals, and coral reef ecosystem fisheries - under Alternative 1A, a de facto closure of the crustacean fishery would remain in place as described above. It is possible that closure of the NWHI fishing grounds could help rebuild stocks in the MHI and sustain or increase harvests, thereby mitigating the revenue reductions from fishing restrictions. However, the ability of closed areas to increase yields has not been demonstrated for bottomfish or pelagic fisheries in Hawaii. It should also be noted that, even if a closed area has the potential to have a positive effect on fish populations and fishery productivity, it may take several years after the closure of the NWHI fishery occurs for this effect to be realized for bottomfish because of the high age of first reproduction for most bottomfish species. Given this time lag, it is unlikely that the potential economic benefits of an area closure would accrue to the current (and under these alternatives, the last) generation of bottomfish fishermen. In addition, recent information indicates that larval transfer is more likely to flow from the MHI to the NWHI than the reverse. Thus closing NWHI fisheries may be unlikely to increase MHI stocks. If fishing effort is allowed to increase in the MHI, any economic gains from closing the NWHI will be dissipated over the long-run.

Reductions or a loss of Hawaii-caught bottomfish such as opakapaka and onaga may also reduce revenues to restaurants that depend on these world-renowned "signature" dishes. Alternatives that limit or reduce fishing effort will correspondingly reduce crew and support industry employment opportunities for Hawaii residents. A study of workers that were laid off following the shut down of the sugar industry on the island of Hawaii found that more than a year after the loss of their jobs 35 percent of the interviewees were still unemployed and seeking work (DeBaryshe et al. undated). Anecdotal evidence suggests that many of those who had found employment were in temporary or seasonal jobs. Although three-quarters of the plantation workers who were laid off made use of state-sponsored job training services, use of these services did not increase the chance of finding a new job. Demographic characteristics such as age, former plantation job grade and education were also largely unrelated to the likelihood of re-employment. It is likely that individuals who lose their jobs as a result of closure of fisheries within the proposed NWHI sanctuary would encounter similar difficulties in finding suitable alternative jobs.

Deckhands would arguably be the most severely impacted by termination of NWHI fisheries, they will probably be the first to lose their jobs and they may have the greatest difficulty in finding alternatives. Pooley and Kawamoto (1990) indicate that the net revenue of a bottomfish fishing vessel operating in the NWHI is most sensitive to the crew share percentage and to changes in total fixed costs. If termination of fisheries in the proposed NWHI sanctuary results in a reduction in net revenues, captain/owners may partly try to make do by decreasing the pay of deckhands or laying them off. Appropriate employment opportunities outside of fishing may be limited for affected individuals, and for many the income losses may be long-term.

Those who become unemployed would face the social and psychological costs of job loss. Individuals who lose their jobs typically experience heightened feelings of anxiety, depression, emotional distress and hopelessness about the future, increases in somatic symptoms and physical illness, lowered self-esteem and self-confidence and increased hostility and dissatisfaction with interpersonal relationships (DeBaryshe et al. undated). In addition, both spouses and children of such individuals are at risk of similar negative effects.

The aforementioned study of workers displaced from the sugar industry found many families reported difficulty in paying bills and in affording transportation, health care and even food and clothing (DeBaryshe et al. undated). The results of this financial strain were high levels of psychological distress among some family members as well as an increase in physical health problems. It is probable that a similar level of stress would be experienced by individuals who lose their jobs as a result of closure of fisheries.

It is likely that many families that depend on fishing and the seafood industry in Hawaii are already economically, socially and psychologically stressed because of fluctuating catch rates, increasing competition and unstable markets. In Hawaii, there have been a number of highly publicized clashes between the owners of large and small fishing boats and between fishermen who are newcomers and those who are established residents. Contributing to this stress is the imposition of ever more restrictive state and federal regulations. Undoubtedly, many fishermen in Hawaii have the sense that government regulations are "boxing them in" and reducing their ability to maintain their characteristic highly flexible fishing strategy (Pooley 1993a; Hamilton et al. 1996; Polovina and Haight 1999). This flexibility is important to the economic success of many smaller and medium-sized fishing vessels because of natural variations in the availability of various types of fish. Closure of fisheries within the proposed NWHI sanctuary would further confine fishermen and could jeopardize the long-term economic viability of their fishing operations. Obviously the loss of potential income from the unfished precious corals and coral reef fisheries will be easier to bear than the loss of historical income from the lobster fishery, however all groups are likely to be angry and frustrated at the closure of fisheries which they believe to be responsible and carefully regulated and unlikely to adversely impact NWHI marine resources.

In addition to potential economic losses associated with the cessation of NWHI fishing, there would be the loss of lifestyle to contend with; assuming that displaced fishermen cannot find an equally satisfactory alternative way of life. A 1993 survey of owner-operators and hired captains who participate in the NWHI bottomfish fishery found that enjoyment of the lifestyle or work itself is an important motivation for fishing among fishery participants. This survey also found that half of the respondents who fish in the Ho'omalu Zone are motivated by a long-term family tradition. Some fishermen would be able to continue their fishing lifestyle by switching to other fisheries, but the aspects of the maritime culture associated specifically with fishing in the NWHI (place names, stories associated with the NWHI, fishing strategies, etc.) would be lost. Fishermen who have invested many years learning to fish in the area would lose the opportunity to connect with that landscape and apply their locale-specific fishing skills and knowledge.

Closure of NWHI fisheries would also likely have a negative impact on those who value the continued existence of Hawaii's maritime tradition and culture. Hawaii's commercial fishing industry dates back nearly 200 years, and fishermen have engaged in commercial fishing in the NWHI since at least the early part of the last century. By reducing the diversity and economic viability of the commercial fishing life way in Hawaii, the closure of NWHI fisheries would diminish the influence of Hawaii's maritime culture. They will also negatively impact Hawaii's social and technical fisheries capital, meaning that not only will a way of life be closed off, but the knowledge of how to successfully fish in these remote fisheries will also be lost. Experience in other Pacific island areas has illustrated that this knowledge can be lost in one generation and often cannot be regained.

Impacts of the Preferred Alternative on National Costs and Benefits

The implementation of the preferred alternative would allow some limited fishing to continue in the proposed NWHI sanctuary under a science-based mixed-use regime. Other fisheries would be closed or prohibited from opening. Balancing the loss of these fisheries and foreclosed future opportunities would be the establishment of the nation's largest and most remote marine sanctuary, in which a very narrow type and level of fishing and other activities would be allowed. For most of the nation this benefit will be enjoyed passively, through the viewing of educational and promotional videos and other materials. Non-use values, also referred to as passive-use or existence values, do not involve personal consumption of derived products nor *in situ* contact. (Bishop 1987). Non-use values may, nevertheless, be the most important benefit derived from such a remote area that the general public is not able or encouraged to visit. The most visible manifestation of existence values is the donation of funds to private organizations that support activities to preserve wild spaces. However, whether people enjoy existence values of resources is not contingent upon whether they donate money to support a cause. Any impact of non-use values would be a hedonic (non-market) effect.

Particularly in the United States and western Europe, there are those who consider that certain amounts of wild spaces should not be impacted by humans under any circumstances. The perceived need for conservation of such spaces may be independent of any impact caused by fishing or other human activities. This perception may also influence the response of resource managers to resource management issues. For example sharks are known to attack endangered Hawaiian monk seals in the NWHI, however managers are unable to agree on whether culling aggressive sharks would represent an inappropriate manipulation of the NWHI ecosystem. Such views are strongly culture-dependent (Hall 1998). No valuation studies have been conducted specifically for the proposed NWHI sanctuary; as a result new research would be needed to understand the specific non-use value of this area and how such value would be affected by the preferred alternative.

9.0 APPENDIX B: Summary of Hawaii Bottomfish and Seamount Stocks

Summary of Hawaii Bottomfish and Seamount Groundfish Stocks
September 2005

GENERAL BACKGROUND

Bottomfish

- Hawaiian bottomfish are a collection ("complex") of deep slope snappers, groupers, and jacks.
- Fishery features a range of vessel sizes (15-70 feet in length) that fish in deep waters (200-1,200 feet) using vertical handlines (hook and line, not longline or trawls).
- Northwestern Hawaiian Island (NWHI) bottomfish is highly valued in the Hawaii fresh fish market due to larger sizes of fish (for fillets), important for tourism-based restaurants and local cultural holiday activities.
- Fishery has been in operation at various levels since 1913. Currently there are 9 active commercial bottomfish vessels in the NWHI, 325 commercial vessels in the MHI.
- Fishery features minimal finfish by-catch and very few protected resource interactions. The most recent observer placements (2004-2005) did not observe any protected resource interactions. Submersible surveys at two NWHI bottomfishing banks found very little damage that could be associated with fishing activities.
- Imports of snappers and groupers have varied over the years in terms of volume, value, and location. In 2004, using U.S. Customs data, 765,000 pounds ($1,959,000) were imported, most from Tonga (44%), Australia (29%), and New Zealand (18%), compared to a total of 494,600 pounds ($2,177,000) from the Hawaii bottomfish fishery as a whole in 2004.

Bottomfish Stock Status Statistics

	Management Zones: MHI	Mau	Ho-omalu	Full Archi-pelago
These are current values in real units.				
2003 CPUE	190	476	488	-
2003 Effort	1628	199	305	-
These are the reference values in real units.				
MSY CPUE	407	470	431	-
MSY Effort	868	208	789	-
These are current values expressed as ratio of the reference values.				
CPUE Ratio	0.47	1.01	1.13	0.82
Effort Ratio	1.88	0.96	0.39	1.13
Full archipelago ratios use weighting factors based on bottomfish habitat in the management zones.				
Weights	0.447	0.124	0.429	-
These are the threshold values for MSST and MFMT.				
MSST (CPUE Ratio)	0.7	0.7	0.7	0.7
MFMT (Effort Ratio)	1	1	1	1

(at CPUE ratios < 0.7, MFMT declines linearly from 1 to 0.)

Definitions:
CPUE = catch per unit effort (pounds per day)
Effort = fishing effort (days)
MSST = minimum stock size threshold, overfished defined as lower than this threshold
MFMT = maximum fishing mortality threshold, overfishing defined as higher than this threshold

Seamount Groundfish

- Seamount groundfish fishery at Hancock Seamounts is distinct from NWHI bottomfish fishery – different species – different locations – different habitat – different gear.
  - A different complex of species (armorhead, alfonsin, and Japanese butterfish)

- Caught with different types of fishing gear (trawls) in deeper waters by distant-water foreign fishing vessels.
- Most of the fishery was in international waters but some fishing was within the U.S. Exclusive Economic Zone (EEZ) at Hancock Seamounts – roughly 150 miles west of Kure Atoll in the far western end of the NWHI.
- Seamount groundfish fishery has been subject to a fishing moratorium since 1986, when the fishery was determined to be over-fished due to over-harvesting by foreign trawlers prior to implementation of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) in 1976.
- No Federal permits were issued to domestic or foreign entities for this fishery.

BOTTOMFISH FISHERY MANAGEMENT

- Managed under the Western Pacific Regional Fishery Management Council's (WPRFMC's) Bottomfish and Seamount Groundfish Fishery Management Plan (FMP). [See http://www.wpcouncil.org/bottomfish.htm]

- 3 bottomfish fishery management zones in Hawaii established to distribute local fishing effort (see Figure 1):
  - All zones include the same multispecies bottomfish stock complex (see Appendix A).

  - **Main Hawaiian Islands (MHI)** – waters surrounding inhabited Hawaiian Islands
    - 80% of MHI fishing grounds are inside State waters. The zone is managed by the State of Hawaii although the WPFMC has made recommendations to the State over time concerning management in the MHI.
    - Unlimited entry; approximately 3,600 vessels are registered with the State of Hawaii to conduct bottomfishing in the MHI. Of these vessels, commercial landings are reported from only 325 vessels. No other licenses or permits are required.
    - Maximum landings occurred in 1988, at 1,166,000 pounds ($3,288,000).
    - Essentially impossible to separate MHI commercial catch into State and Federal portions with the existing data (State of Hawaii catch reports) which record catch in reporting "blocs" which range from 0 to 2 miles, 2 to 20 miles, and 20 miles out.
    - Recreational bottomfish catch data are just now being collected by the cooperative NMFS and State of Hawaii Marine Recreational Fishing Statistics Survey (HMRFSS) intercept creel census program, but few bottomfish fishers have been intercepted by the HMRFSS field staff to date. No estimates have yet been compiled of recreational bottomfish landings in Hawaii.
    - The State of Hawaii and the WPRFMC are also supporting a targeted survey of registered bottomfish fishers to: 1) determine the level of recreational bottomfishing in the MHI; and 2) obtain comments on bottomfish management options for MHI. This survey is on-going.

- **Northwestern Hawaiian Islands (NWHI)**
  - **Mau** zone – a small zone at the eastern end of the NWHI encompassing the islands of Nihoa and Necker. The fishery operates on trips lasting up to 2 weeks).
  - Essentially 100% of habitat in Federal waters.
  - Managed under the WPRFMC's Bottomfish and Seamount Groundfish FMP.
  - 4 vessels had permits to fish in the Mau zone when the zone was established in 1988. Maximum number of vessels was 14 in 1990-1991.
  - In 1999, limited entry program established with 7 vessels participating.
  - Currently, a total of 5 vessels can be permitted and 5 are currently permitted.
  - Maximum landings occurred in 1990 (14 active permitted vessels) at 249,000 pounds ($630,000).

- **Ho'omalu** zone – a larger limited entry zone at the center and western end of the NWHI ranging from French Frigate Shoals to Kure Atoll. The fishery is a distant water fishery and fishing activity is limited by weather and the fresh seafood nature of the fishery.
  - Essentially 100% of habitat in Federal waters.
  - Managed under the WPRFMC's Bottomfish and Seamount Groundfish FMP.
  - In 1987, fishery established with limited entry program; 12 vessels participating at that time.
  - Currently, a total of 4 vessels can be permitted and 4 are currently permitted
  - Maximum landings were in 1992 (5 active permitted vessels) at 353,000 pounds ($1,030,760).

- Other management measures include limitations on vessel size, prohibitions on certain gear types, mandatory catch reporting, and mandatory observer coverage in the NWHI.
- Status of the fishery and stocks is assessed annually, and management measures enacted as deemed necessary.

Despite delineation of these three management zones, Hawaiian bottomfish are evaluated under MSFCMA National Standard 1 guidelines as a single archipelagic-wide multispecies stock complex or population. Management criteria, such as whether the stock complex is overfished or whether overfishing is occurring, apply to the stock complex as a whole population rather than to individual management zones.

However, historically and currently bottomfish population status indicators have been compiled for each of the three zones as a guide to local fishery management.

HAWAII BOTTOMFISH STOCK STATUS

<u>Historical Stock Status and Trends</u>

- Fishery status was evaluated based on a species-specific 20% SPR threshold (spawning potential ratio, an index of the reproductive capability of the stock), from 1986-2003. Species-specific SPR values were reported for the archipelago, as well as individual zones, but stock status was determined at the archipelago level. While there are limitations to the SPR approach, it was the best available method for tracking year-to-year changes in the fishery until mid-2003 when the revised National Standard 1 guideline approach was put in place.

- Under the SPR approach:
  - No stocks of bottomfish in the Hawaiian archipelago were overfished. However, in the MHI, *ehu* and *onaga* populations were reported to be locally depleted. This led to a suite of State of Hawaii regulations in 1998, including recreational bag limits and 20 closed areas throughout the MHI.
  - In the NWHI, local depletion was not reported for any species. SPRs were well above 20% for all species.

Based on the SPR measures, the bottomfish stock complex was <u>not</u> overfished in any year from 1986 to 2003.

<u>Current Stock Status</u>

- After mid-2003, under the new MSFCMA National Standard 1 guidelines, "overfishing" and "overfished" definitions were established for the Hawaii bottomfish fishery. Hawaii bottomfish are assessed as a single archipelagic multispecies stock complex for these purposes, however the status of bottomfish in each of the 3 zones continues to be assessed annually to facilitate effective conservation and management decision making.
- National Standard 1 guidelines define:
  - Overfishing -- too much fishing (relative to fishing mortality at maximum sustainable yield (MSY)); we use fishing effort (expressed as days fished) as a proxy for fishing mortality and assess overfishing annually by comparing the current overfishing metric to an established threshold (maximum fishing mortality threshold (MFMT)) for bottomfish.
  - Overfished -- not enough fish (relative to biomass at MSY); we use catch per unit effort (CPUE) expressed as pounds caught per day as a proxy for abundance; overfished status is determined annually by comparing the current overfished metric to an established threshold (minimum stock size threshold (MSST)) for bottomfish.
- Under the National Standard 1 guidelines:
  - The Hawaiian bottomfish stock is **not** overfished (the *biomass* standard); however, overfishing (the *fishing* mortality standard using fishing effort as a proxy) is occurring as reported in the 2003 annual report of the WPRFMC and in the 2004 NOAA Fisheries Status of Stocks report to Congress [http://www.nmfs.noaa.gov/sfa/domes_fish/index.htm].
  - The WPRFMC is currently developing options within its Bottomfish and Seamount Groundfish FMP to address this situation. Under the MSFCMA, the WPRFMC has one year to develop a plan to address this overfishing concern.

In summary:

Based on nationally- and legally-accepted definitions, in 2003, overfishing was occurring on the Hawaii bottomfish stock complex on an archipelagic basis but the bottomfish stock complex was not overfished, i.e., sufficient biomass remained. Further, as reported below, this over-fishing situation is reflected by the situation in the MHI, not the NWHI.

Projected Stock Status and Trends

- **Archipelago-wide trends:**
  - The fishing mortality ratio indicator (i.e., fishing effort) for the archipelago has experienced significant fluctuations; since 1998 it has continually declined (see Figure 2).
  - The biomass ratio indicator for the archipelago has manifested a more stable trend with no significant change (see Figure 2).
  - Mean weights for individual fish are declining, which is expected with fishing; however, mean weights in both NWHI zones remain significantly higher than those in the heavily fished MHI. Alternative explanations exist for changes in captured fish size, such as gear configuration, gear competition, size targeting, fishing location, and fishing ability. Anecdotal information from fishermen and submersible observations of size/age related segregation of fish over the fishing grounds tend to confirm that weights are associated with fishing style.
  - Trends in landings of particular species are not used as a measure of abundance or fishery health because landings of one species can change dramatically with species targeting, market incentives, gear competition, or natural changes in the ecosystem. Good examples are the pig-lipped *ulua* (*butaguch,* a jack) and *uku* (a grey snapper), which are targeted at various times of the year in response to seasonal fluctuations in demand.

- Trends in the **MHI** (see Figure 3)
  - CPUE in the MHI is relatively stable over the past decade.
  - Since 1998, reported commercial fishing effort in the MHI zone has declined by 50%; commercial participation also has declined.
  - Because of the overfishing status of the Hawaii bottomfish fishery, the WPRFMC is currently evaluating effort reduction alternatives in the EEZ portion of the MHI.

- Trends in the **Mau Zone** (see Figure 4)
  - CPUE in the Mau zone was relatively stable over the past decade but has been increasing in recent years as participation has dropped.
  - Participation in the Mau zone has declined by approximately 70% from 14 vessels in 1990 to 5 vessels in 2003 as anticipated under the limited entry system.
    - Participation is capped at current participants (however, regulatory changes have been proposed by the WPFMC to enable new Mau zone entrants)
    - Further attrition is anticipated due to current use-or-lose permit policy and the on-going uncertainty in the status of the NWHI fishery under the Executive Order.

- Significant restrictions in or closure of the Mau zone bottomfish fishing grounds are expected to concentrate effort in open areas, possibly causing further depletion in the MHI.

- Trends in the **Ho'omalu Zone** (see Figure 5)
  - CPUE has declined over time as consistent with a sustainable fisheries population dynamics model.
  - Since 1990, participation has remained fairly constant, while effort has fluctuated and shows no discernible trend.
  - Significant restrictions in or closure of the Ho'omalu zone bottomfish fishing grounds would be expected to concentrate effort in open areas, possibly causing increased depletion in the MHI.

DATA AND METHODOLOGY

Stock Assessment Data Sources and Data Collection Frequency

- PIFSC scientists conduct bottomfish biological stock assessments annually; these assessments are conducted under "data poor" conditions. Data poor refers to the quantity of data, not quality, and suitable assessment methodologies are available for application under such conditions.
- From 1984 to 1990, NMFS relied on shoreside monitoring at the Honolulu auction to estimate catch per trip and to track fishing effort (number of trips).
- Currently, PIFSC uses two sets of State of Hawaii commercial fishery-dependent catch data:
  - Fishing "bloc" data compiled per vessel per day for the MHI
  - Logbook data for the NWHI (available since 1991)
- From1984-1990 PIFSC utilized shoreside monitoring to compile size composition and other biological and economic information from the NWHI; recently electronic data reporting through Honolulu seafood dealers has come on-line and is available for this purpose.
- The results of the stock assessments are presented to the WPRFMC's Bottomfish and Seamount Groundfish plan team for review and compiled in an annual report by the WPRFMC (see http://www.wpcouncil.org/bottomfish.htm #AnnualReports)
- The most current annual report is for the data year 2003. Data for 2004 are currently being compiled and evaluated.

Data and Methodology Uncertainties, Gaps, Needs

- To date, NWHI CPUEs have been reported in terms of catch per day and have not been standardized by vessel fishing power
  - NWHI fleets are extremely small (5 vessels in the Mau zone and 4 vessels in the Ho'omalu zone). Entry or departure of one or more vessels can greatly influence the overall fishing performance of the fleet, the resultant CPUE, and as a result, estimates of biomass based on those CPUEs.
  - As a result, current CPUEs in this very small and very specialized handline fishery may be related more to fishing ability or skill, rather than fish abundance; careful standardization of commercial catch data is necessary prior to interpretation

- CPUE data at the line-hour level (optimal) for each NWHI vessel can be generated from 1997 to the present from new State of Hawaii logbook
- PIFSC staffers have developed algorithms to incorporate this improved data and will have results by November 2005 to use these new measures in calculating National Standard 1 reference points

• In January 2004, a Bottomfish Stock Assessment Workshop was held in Honolulu co-sponsored by the WPFMC and PIFSC, bringing together an ***independent scientific panel*** of stock assessment experts
  - The objective of the workshop was to evaluate the existing bottomfish data and stock assessment techniques and make recommendations for future assessments
  - Some of the recommendations included:
    - Collect biological data such as length, weight, sex, maturity, and age for key species in order to update important life history parameters
    - Implement a tagging program to determine the extent of movements
    - Initiate a routine fishery-independent survey to provide unbiased estimates of abundance (biomass)
    - Apply several stock assessment models to the data
    - If feasible, create an operational model of the fishery
    - Assess the extent of spatial structuring in Hawaiian bottomfish populations and incorporate this complexity in future assessment and management models

  - The results from this workshop are in the midst of being implemented with the assistance of independent academic stock assessment experts under contract to PIFSC who will: 1) evaluate existing bottomfish data collection programs and if necessary provide recommendations to enhance these programs; and 2) advance population modeling and stock assessment methodologies through the incorporation of spatial structure and ecosystem principles

• In the future, PIFSC will be conducting a three-stage peer-reviewed process to development of significant stock assessments: 1) a detailed review and "certification" of the available data; 2) evaluation and testing of the stock assessment models and assumptions; and 3) review of stock status and implications. This will require more formality in the stock assessment process, and as a result, lengthier time-frames until the new procedures are routinized.

-- Compiled by PIFSC fishery biology staff, September 2005, from public information sources

Glossary:

CPUE – Catch per unit effort, an index of fishing performance often utilized as a measure of fish abundance, after careful standardization.

EEZ -- Exclusive economic zone, generally the region 3 to 200 miles offshore.

FMP – federal Fishery Management Plan.

HMRFSS – Hawaii Marine Recreational Fishing Statistics Survey.

MHI – Main Hawaiian Islands, the inhabited islands in the lower portion of the Hawaiian Archipelago (Middle Bank, Niihau, Kauai, Oahu, Molokai, Kahoolawe, Maui, Lanai, Hawaii).

MFMT – Maximum fishing mortality threshold, a reference point for overfishing status in the NMFS National Standard 1 guidelines, values higher than this threshold are overfishing by definition.

MSFCMA – Magnuson Stevens Fishery Conservation and Management Act (1976 as subsequently amended).

MSST – Minimum stock size threshold, a reference point for overfished status in the NMFS National Standard 1 guidelines, values lower than this are overfished by definition.

MSY – Maximum sustainable yield, a reference point in fisheries describing a degree of resource utilization which allows maximum removal while ensuring long term sustainability.

NWHI – Northwestern Hawaiian Islands, the portion of the Hawaiian Archipelago stretching from Nihoa to Hancock Seamount.

PIFSC – NOAA Fisheries Pacific Islands Fisheries Science Center

SPR – Spawning potential ratio, a stock assessment index related to the reproductive health of a stock, no longer utilized by NMFS as a measure of "overfished" status, but remains an important stock indicator and remains in the Control Rule as a second (species specific) layer.

WPRFMC – Western Pacific Regional Fishery Management Council, the policy-making organization for the management of fisheries in the EEZ around the Territory of American Samoa, Territory of Guam, State of Hawaii, the Commonwealth of the Northern Mariana Islands, and US Pacific island possessions.

Convenient information sources

Pacific Islands Fisheries Science Center

http://www.pifsc.noaa.gov/

NOAA Fisheries Office of Sustainable Fisheries

http://www.nmfs.noaa.gov/sfa/domes_fish/index.htm

Western Pacific Fishery Management Council

http://www.wpcouncil.org/

Figure 1. Map of Hawaiian Archipelago showing location of bottomfish management zones.

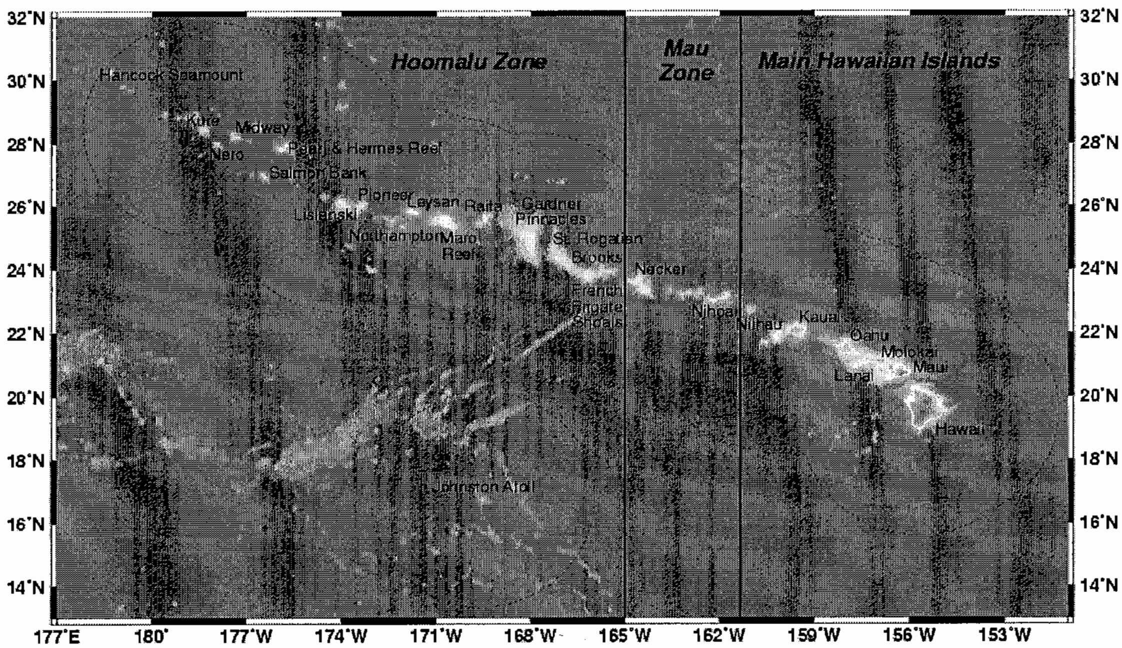


Figure 2. Hawaii bottomfish effort and biomass ratios (archipelago-wide, including all management zones).

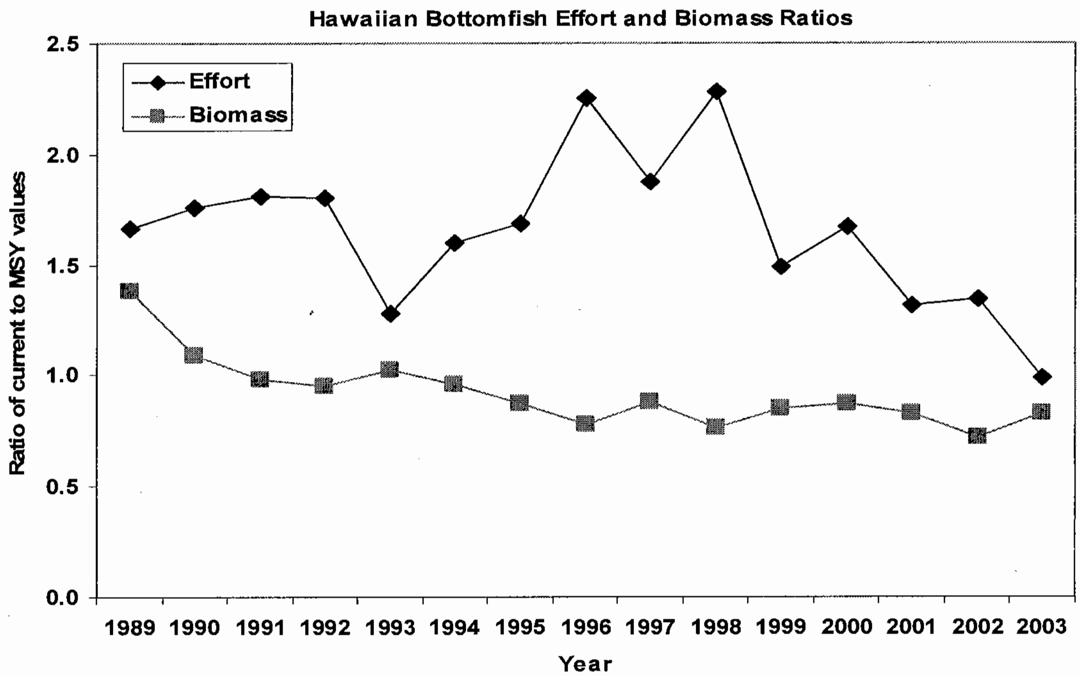


Figure 3. MHI zone fishery time series [nominal data]

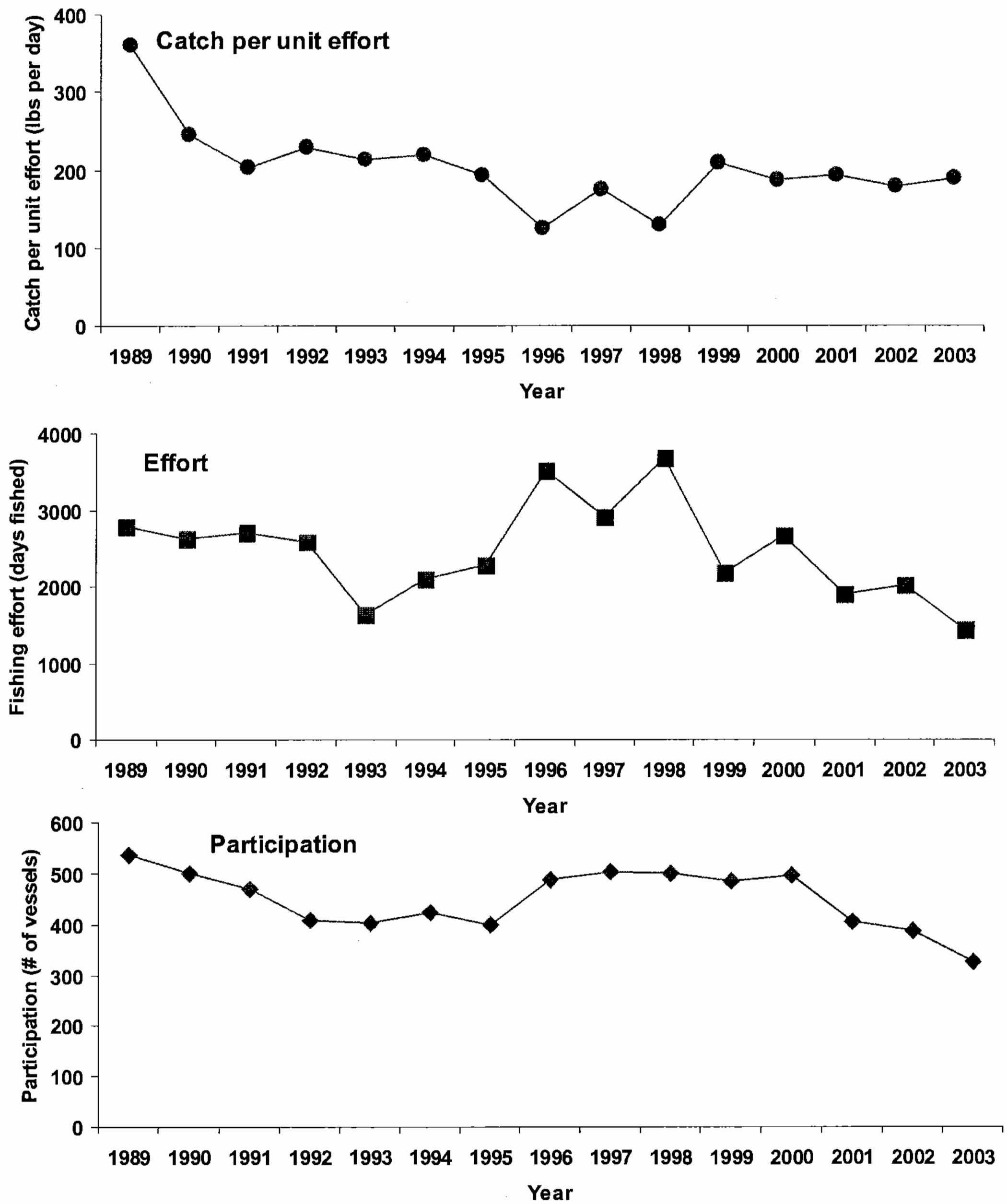


Figure 4. Mau zone fishery time series [nominal data]

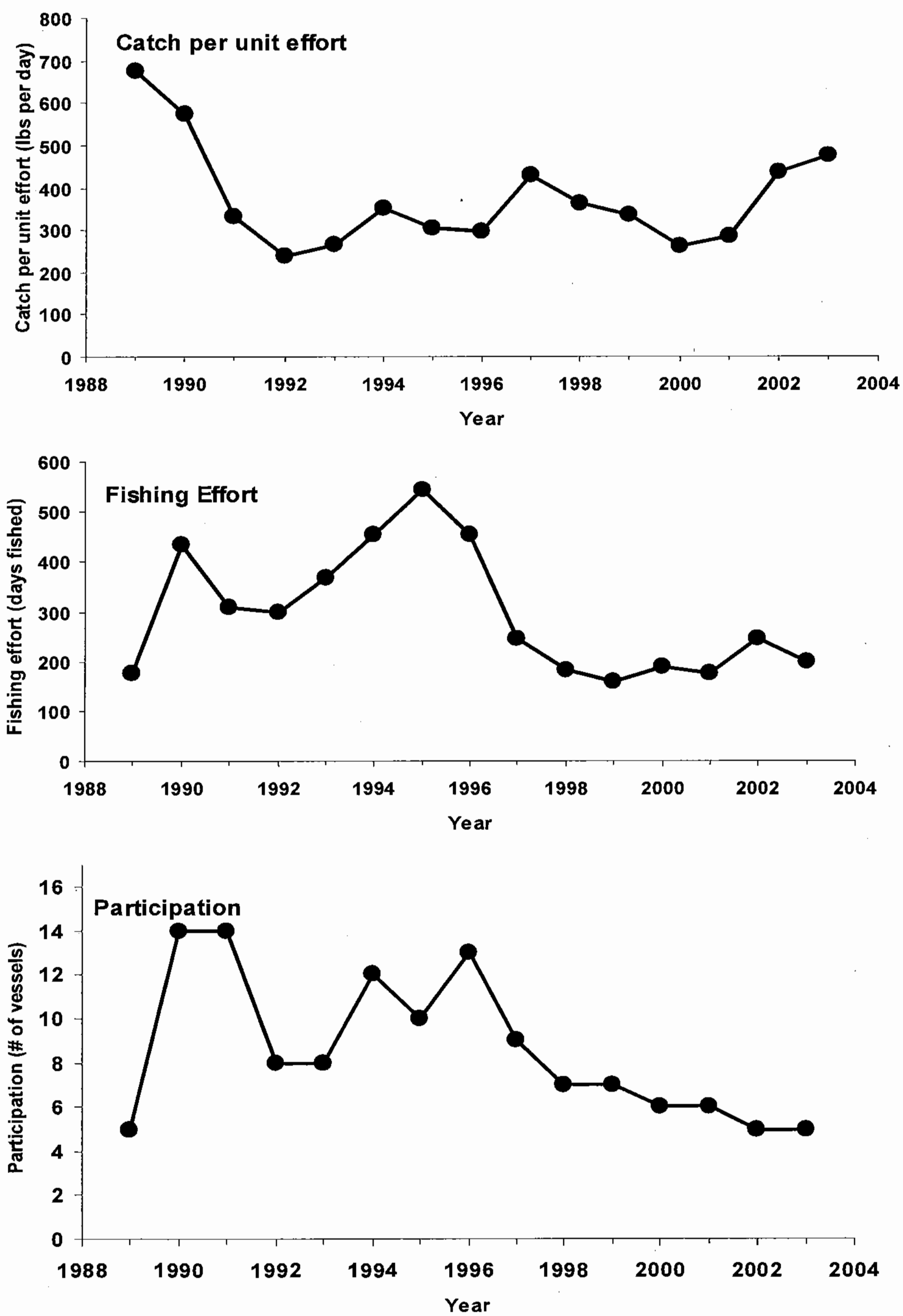
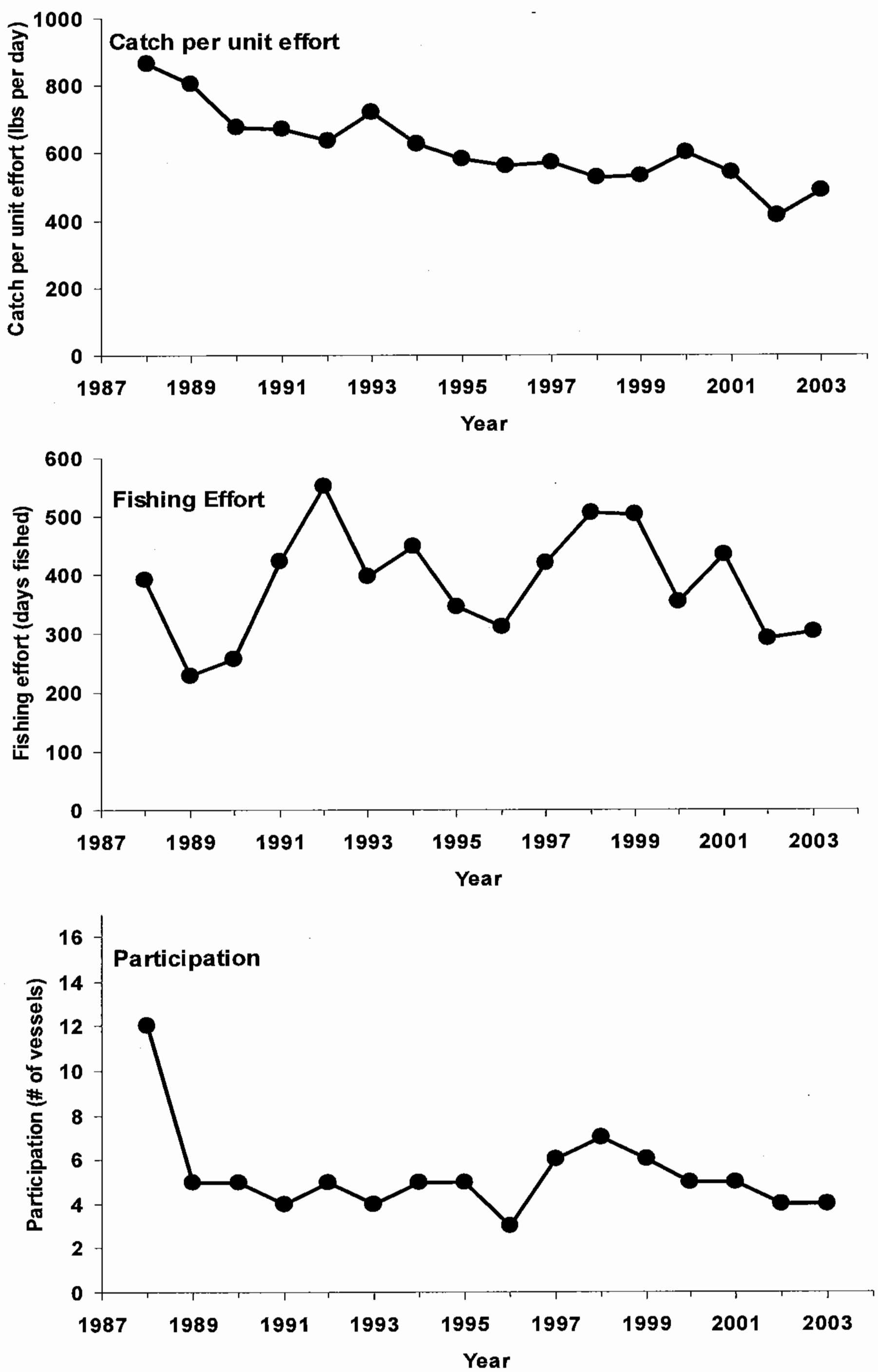


Figure 5. Ho'omalu zone fishery time series [nominal data]

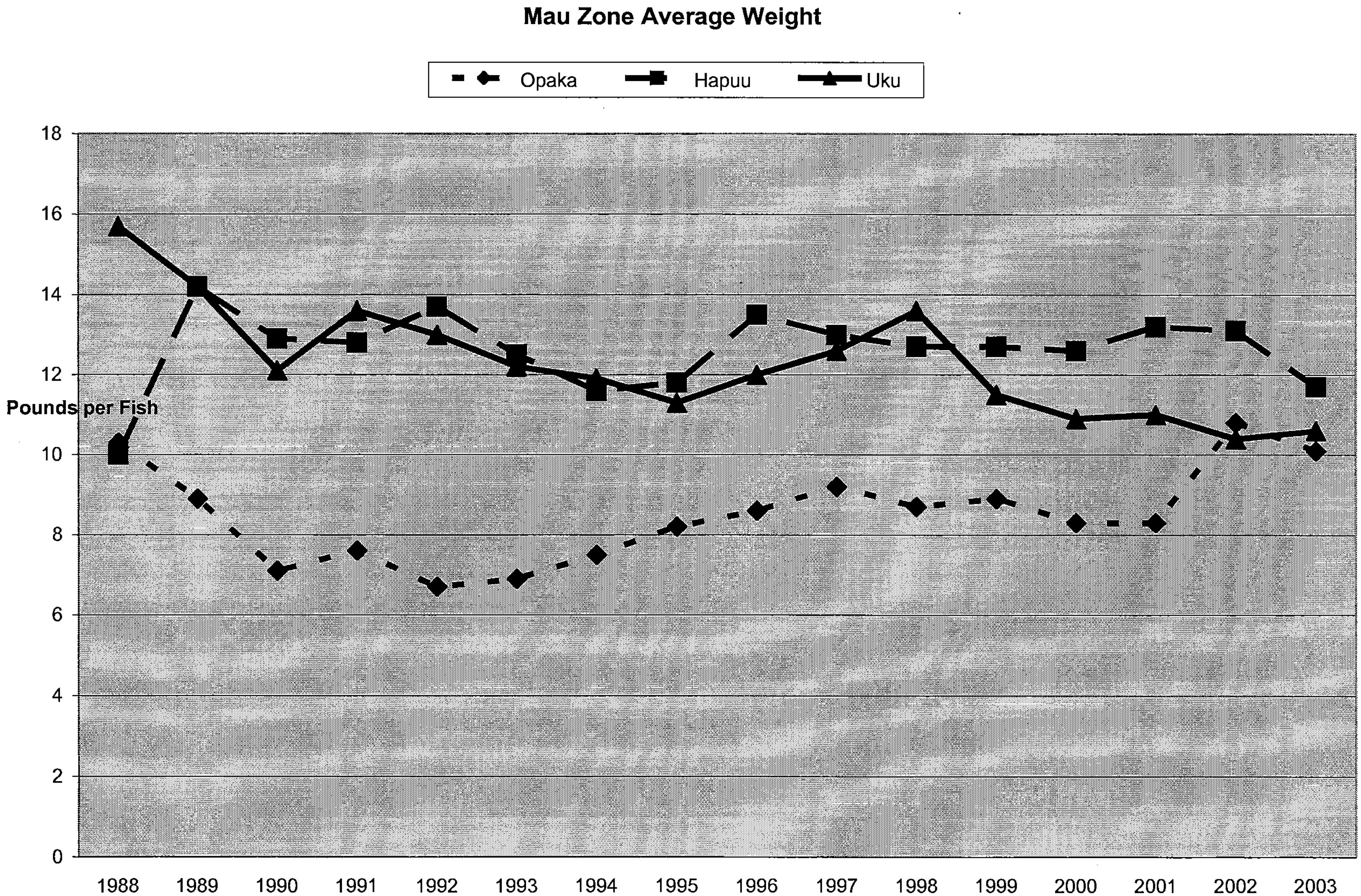


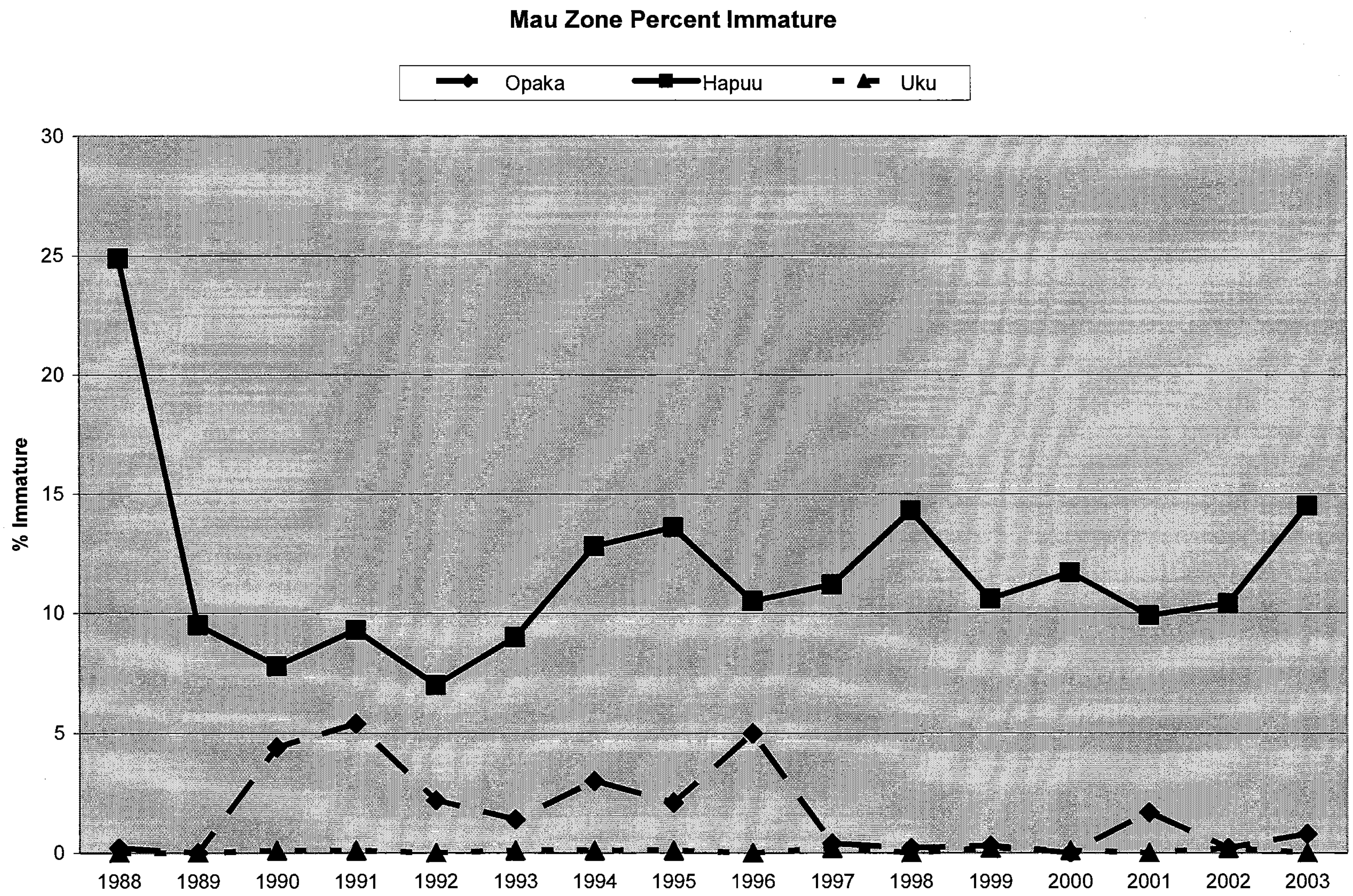
Appendix A: Hawaii Bottomfish and Seamount Groundfish Species

Scientific	English Common	Hawaii Common
Bottomfish:		
Aphareus rutilans	red snapper/silvermouth	lehi
Aprion virescens	gray snapper/jobfish	uku
Caranx ignobilis	giant trevally/jack	white ulua/pau'u
C. lugubris	black trevally/jack	black ulua
Epinephelus fasciatus	blacktip gouper	
E. quernus	sea bass	hapu'upuu
Etelis carbunculus	red snapper	ehu
E. coruscans	red snapper	onaga
Lethrinus amboinensis	ambon emperor	
L. rubrioperculatus	redgill emperor	
Lutjanus kasmira	blueline snapper	ta'ape
Pristipomoides auricilla	yellowtail snapper	yellowtail kalekale
P. filamentosus	pink snapper	opakapaka
P. flavipinnis	yelloweye snapper	yelloweye opakapaka
P. seiboldi	pink snapper	kalekale
P. zonatus	snapper	gindai
Pseudocaranx dentex	thicklip trevally	butaguchi/pig ulua
Seriola dumerili	amberjack	kahala
Variola louti	lunartail grouper	
Seamount Groundfish:		
Beryx splendens	alfonsin	kinmedai (Japanese)
Hyperoglyphe japonica	ratfish/butterfish	medai (Jap.)
Pseudopentaceros richardsoni	armorhead	kusakari tsubodai (Jap.)

Representative Summary Statistics from the NWHI Mau Zone

2 figures attached based on data from the WPFMC annual reports


Mau Zone Average Weight
Opaka
Hapuu
Uku
Pounds per Fish
18
16
14
12
10
8
6
4
2
0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003


Mau Zone Percent Immature
Opaka
Hapuu
Uku
% Immature
30
25
20
15
10
5
0
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003

10.0 APPENDIX C: Correspondence with NOAA Regarding the NWHI

October 28, 2004 Letter to NOAA Establishing the Council's NWHI Sanctuary Goal and Objectives

October 24, 2005 Letter from NOAA Rejecting the Council's Recommendations

November 11, 2005 Letter to NOAA in Response to NOAA's Determinations

January 18, 2006 Letter from NOA Regarding Fishing under the MSA

Western
Pacific
Regional
Fishery
Management
Council

October 28, 2004

Mr. Daniel J. Basta
Director
National Marine Sanctuary Program
1305 East West Highway
SSMC-4
Silver Spring, MD 20910

Dear Dan,

Thank you for your letter of September 20, 2004 which accompanied the National Marine Sanctuary Program's *Proposed Northwestern Hawaiian Islands National Marine Sanctuary - Advice and Recommendations on Development of Draft Fishing Regulations Under the National Marine Sanctuaries Act Section 304(a)(5).*

Given our many conversations concerning the requirement for a full analysis of the likely environmental impacts of management measures prior to any decision making, we were disappointed not to receive a preliminary draft environmental impact statement or comparable analytical document from your office prior to your request for Council action. This requirement appears consistently in several applicable Acts and their implementing regulations (e.g. Sections 301, 303 and 304 of the Magnuson-Stevens Fishery Conservation and Management Act, Sections 304 and 305 of the National Marine Sanctuaries Act, and Sections 101 and 102 of the National Environmental Policy Act[1]) and is intended to ensure that environmental information is available to public officials before recommendations or decisions are made and before actions are taken. In addition, the National Environmental Policy Act instructs that its requirements be integrated with other planning and environmental review procedures required by law or by agency practice so that all such procedures run concurrently rather than consecutively.

Although your office may view the Council's recommendation on draft fishing regulations as the "first step" in the environmental review process, they represent the "last step" in decision making for the Council and are therefore subject to the same procedural and analytical requirements applicable to any other Council decision or recommendation.

[1] Section 105 of the National Environmental Policy Act affirms that its requirements are "supplementary to those set forth in existing authorities of Federal Agencies" which would include the National Ocean Service and its National Marine Sanctuaries Program.

It is unfortunate that the document which we received on September 20, 2004 consisted of a cursory and in many instances, factually incorrect review of available information on the affected environment, and accompanied by a seriously flawed examination of the potential impacts of several fishery management alternatives.

Additionally, the fishing goal and objectives are highly prescriptive statements that lack rationale or analyses and appear to have been written with the explicit intention of constraining management options to those actions predetermined to be desirable. Further, the inclusion of the undefined and highly subjective phrase "As appropriate to maintain the natural character or biological integrity of any ecosystem of the region" results in a series of fishing objectives that are completely undefined and unmeasurable. The lack of definitions for "natural character," and "biological integrity" once again leaves decision makers and the public with no basis on which to evaluate the desirability or likely outcomes of adopting this proposal. Given this wording, it is the Council's belief that the majority of fishing restrictions proposed are unnecessary as the Northwestern Hawaiian Islands have been recently evaluated as "near pristine" despite their long history of fishing and other uses. Clearly existing management regimes have been successful in protecting the resources and ecosystem of the area.

Attached is a detailed review of the September 20, 2004 *Advice and Recommendations* document as provided by the Council's Scientific and Statistical Committee and Council staff. In summary, reviewers found that the document is fraught with factual errors, undefined terms, unclear methodologies, subjective analyses and unsupported and conflicting statements, and as such does not provide decision makers with the necessary information on which to base effective recommendations or decisions.

Given this lack of available analyses the Council will be unable draft fishing regulations within the 120 day time period indicated in your letter and hereby requests an extension to April 4, 2004. This will allow for the preparation and review of a draft environmental impact statement focused specifically on fishery issues, and draft fishing regulations prior to final action by the Council at their March 2005 meeting.

Please contact me at your earliest convenience if you anticipate any problems with this approach. I am aware of statutory language in the National Marine Sanctuaries Act indicating a 120 day timeline, however there is no requirement, policy or guidance that I am aware which indicates that this timeline must begin prior to the preparation of the appropriate analytical documents that enable fully informed decision making called for by the Magnuson-Stevens Fishery Conservation and Management Act, the National Environmental Policy Act and the National Marine Sanctuaries Act. Such an extension would also be consistent with your commitment to the Council at its October 2002 meeting at Aloha Tower.

As you know the Council supports the establishment of a National Marine Sanctuary in the Northwestern Hawaiian Islands and is committed to working cooperatively with your office to design and implement fishery management measures that are based on the best available information and meet our Nation's environmental, social and economic needs. To achieve this end, the Council has begun a cooperative and participatory process beginning with a meeting on October 29, 2004 with staff from the National Marine Sanctuary Program, the Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve, NOAA Fisheries, the US Fish and Wildlife Service, the State of Hawaii and the NWHI fishermen. I remain hopeful that we can work together in the spirit of transparent and participatory democracy which is so important to all Americans.

Sincerely,

Roy Morioka
Council Chair

cc: Western Pacific Congressional Delegation
Admiral Conrad Lautenbacher
Bill Hogarth
Michael Weiss
Bill Robinson,
Sam Pooley
Aulani Wilhelm
Peter Young
Jerry Leinecke

enclosed: Reviewers' comments on the *Proposed Northwestern Hawaiian Islands National Marine Sanctuary Advice and Recommendations on Development of Draft Fishing Regulations Under the National Marine Sanctuaries Act Section 304(a)(5).*

WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL

Comments on the September 20, 2004 Proposed Northwestern Hawaiian Islands National Marine Sanctuary - Advice and Recommendations on Development of Draft Fishing Regulations Under the National Marine Sanctuaries Act Section 304(a)(5)

Unfortunately this document consists of a cursory and in many instances factually incorrect review of available information on the affected environment, accompanied by a seriously flawed and conflicting examination of the potential impacts of several fishery management alternatives.

Further, the fishing goal and "objectives" are highly prescriptive statements that lack rationale or analyses and appear to have been written with the explicit intention of constraining management options to those actions predetermined to be desirable as described in NMSP Alternative 3 and its "model regulations". As a general rule, "objectives" are intended to state the concrete outcome of a series of actions, consistent with an overarching goal. This document instead combines actions and objectives into "objectives" with the apparent intent of setting the context for the Council's determination of appropriate fishery regulations to achieve the proposed sanctuary's goals.

In addition, the process described for the implementation of fishing regulations in the proposed Northwestern Hawaiian Islands (NWHI) sanctuary is impracticable and conflicted. For example the document is titled "*Proposed Northwestern Hawaiian Islands National Marine Sanctuary - Advice and Recommendations on Development of Draft Fishing Regulations Under the National Marine Sanctuaries Act Section 304(a)(5)* and the majority of its text references goals, objectives, and alternatives for the proposed NWHI sanctuary. However the National Marine Sanctuary Program (NMSP) Alternative 3 would actually consist of a temporary management regime followed by the establishment of a new task force which would develop yet another management strategy within 1 year. "The task force shall develop an annual aggregate level of harvest not to exceed catch levels for commercial bottomfish/pelagic trolling and commercial pelagic trolling based on recorded landings for each fisherman operating from December 4, 1999 to December 4, 2000."

The document goes on to state that "In the interim between designation and adoption of a revised fishery management plan, the Sanctuary shall manage fishing based on a formula for individual fishing caps as provide for by the Executive Orders 13178 and 13196 (EO). The formula will be based on the recommendations of the Reserve Advisory Council, which takes the 5-year period prior to the EO, removes the highest and lowest-year catch data, and averages the remaining years fished during that period."

Yet a third variation is added in the model regulations for NMSP Alternative 3 which state that "Commercial bottomfishing and associated fishing for pelagics by handline or trolling shall be limited to an amount equal to the Magnuson-Stevens Act permittee's average catch in pounds for bottomfish [definition includes certain pelagics] and the species catch ratio over the best three of the five calendar years from December 4, 1995 to December 4, 2000 in which the permittee was active in the fishery, as determined by the Director."

No reviewer was able to discern the actual meaning or anticipated chronology of these varying regimes, which will control the economic prospects of fishery participants for the foreseeable future. This is the worst type of management as it only continues the five years of confusion experienced by affected parties and reduces their opportunities for intelligent and well-informed decision making.

In addition, the proposals themselves do not make sense or achieve the document's own stated objectives or those of the National Marine Sanctuaries Act (NMSA).

For example, any regime which does not provide for new participants (as fisherman-specific caps or quotas would do) will lead to the ultimate demise of the fishery as current participants retire. This would conflict with Objective 7e which would "allow bottomfishing to continue except within sensitive habitats".

Regimes which seek to control harvests through caps or quotas are generally regarded as a last resort by fishery managers as they are known to lead to highgrading, which is the discarding at sea of fish that are of lesser value than other individuals of the same species. Economically, caps and quotas can be expensive to administer as they require dockside inspections, and can lead to foregone opportunities in pulse fisheries such as NWHI uku. By comparison, the current limited entry program and vessel size limit serves to constrain overall effort in a manner that allows individual participants to avoid depleting stocks by carefully rotating their effort over a very large area and range of species depending on local abundance and conditions.

Although the idea of further restricting landings (it is only landings that can be restricted, as species specific targeting in this fishery is not completely possible) to a given species ratio has initial appeal as perhaps balancing ecosystem removals. However experience has shown that such an approach results in even more highgrading as participants are forced to discard species for which they are over quota while they continue to fill their remaining available quotas. Basing these species ratios on historical catches makes sense only if one has reason to believe that these catches were coincidentally in some ecologically preferable balance. No evidence is supplied to indicate that this is the case.

In fact no evidence is supplied that the existing fishery is adversely impacting the proposed sanctuary resources or that any of these conflicting restrictions are necessary, and no credible rationale for their selection is presented. In fact the document itself states that "Data show that in over a decade of fairly stable fishing operations (Figure 6), the target species populations have remained high based on traditional management measures, including MSY (WPRFMC 2004a)."

This is hardly an example of the proposed sanctuary's stated management principles to recognize that the resources of the NWHI are held as a public trust, and to incorporate and integrate best practices and available science. Neither is it consistent with the purposes and policies of the NMSA to both enhance public awareness, understanding, appreciation and wise and sustainable use of the marine environment and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System, and to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of these marine areas not prohibited pursuant to other authorities.

Several reviewers further commented on the specific draft goals and objectives for the proposed NWHI sanctuary as follows.

Proposed Goal 2 *Provide for comprehensive and coordinated conservation and management that recognizes and complements existing jurisdictional boundaries and management regimes and stakeholder communities.*

Although laudable, evidence to date strongly indicates a lack of commitment to this goal. Fishermen and local fishery managers have attended numerous meetings and voiced a myriad of concerns both orally and in writing to no apparent effect. To the contrary, public statements by the NMSP have sought to convey an atmosphere of collaboration and consensus when in fact fishery participants and managers have been denigrated and misrepresented in both public and private meetings, threatened with fishery closures if they do not compromise their positions, and disenfranchised from participating in the management process.

Proposed Goal 3 *Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.*

This is a highly subjective statement that can be understood only in context of the definitions of natural character and biological integrity, neither of which is defined. Further the de facto attempt to extend sanctuary authority to impacts on "any ecosystem of the region" is in direct conflict with the spirit of the NMSA's implementing regulations which state that "The size of a National Marine Sanctuary, while highly dependent on the nature of the site's resources, will be no larger than necessary to ensure effective management". These are key failures of the document and result in an entirely undefined and ambiguous proposal concerning management of the proposed sanctuary. Lacking such definitions, decision makers and the public are unable to gauge the desirability or likely outcomes of adopting this sanctuary proposal.

Associated text indicates that resources shall be used only for direct personal consumption while in the NWHI, and the sale of any marine resources would be prohibited. However "the customary practice by Native Hawaiian Niihau and Kauai families to travel to the NWHI and bring back ocean resources for community sharing" would be permitted. Historical documents indicate that, in addition to fishing activities, Native Hawaiians utilized the NWHI for the collection of feathers, turtle eggs, turtles and albatross wing bones. If these activities are denied then the benefits of cultural access rights are greatly reduced. Any credible analysis should include a discussion of the traditional role and importance of these activities, their potential impacts on the marine ecosystem of the proposed sanctuary and why it is necessary or desirable for them to be prohibited.

Proposed Goal 5 *Support Native Hawaiian cultural, religious, and subsistence practices that are consistent with the long term conservation and protection of the region.*

Associated text indicates that, in addition to the consumption of fish within the sanctuary (defined elsewhere as sustenance use), subsistence harvests would be allowed only by Niihau and Kauai Native Hawaiians who will "bring back ocean resources for community sharing". No rationale is presented for this measure which would effectively disenfranchise all other Native Hawaiians by denying them access to NWHI resources that many regard as their birthright. This is clearly in conflict with proposed goal 5 as it would limit rather than support Native Hawaiian cultural, religious and subsistence practices. Decision makers should be supplied with an explanation of the rationale, necessity and impacts of excluding Native Hawaiians residing on other islands from accessing the NWHI for such purposes.

Proposed Goal 6 *Support, promote, and coordinate research and long-term monitoring that improves management decision-making and is consistent with the conservation and protection of the region.*

Again, this is a laudable idea but it is contradicted by the lack of research and science presented to support the document's proposals. This does not bode well for achievement of this goal.

Proposed Goal 7 *Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas that minimize or prevent interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.*

Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7a. Prohibit non-subsistence crustacean fishing.

7b. Prohibit commercial precious coral fishing.

7c. Prohibit harvest of all coral species, live rock, all aquaria species and live fish trade species, and algae, sponges, and other invertebrates.

7d. Allow recreational fishing for pelagic species except within sensitive habitats.

7e. Allow bottomfishing to continue except within sensitive habitats.

7f. Allow commercial pelagic fishing using handline, pole and line and trolling gear except within sensitive habitats.

7g. Prohibit subsistence use within the sanctuary except for Native Hawaiian subsistence use

7h. Allow sustenance fishing for pelagic and bottomfish species using pole and line, trolling and handline methods within the Sanctuary except within sensitive habitats.

7i. Allow spearfishing without the use of SCUBA for pelagic species except within sensitive habitats.

7j. All fishing not specifically allowed shall be prohibited.

7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

In general these highly prescriptive objectives lack rationale or analyses and appear to have been written with the objective of constraining management options to those actions predetermined by the NMSP to be desirable. Further, the inclusion of the undefined and highly subjective phrase "As appropriate to maintain the natural character or biological integrity of any ecosystem of the region" results in a series of objectives that are completely undefined and unmeasurable. Lacking definitions for "natural character" and "biological integrity" this once again leaves decision makers and the public with no basis on which to evaluate the desirability or likely outcomes of adopting this sanctuary proposal.

Regarding Objective 7a, the document implies that an active lobster fishery would remove stocks that serve as a potential food source for the endangered monk seal however available information indicates that crustaceans made up only 5.7% of fecal and regurgitated samples collected from the NWHI with over 78% of the monk seal diet consisting of teleost species. The document also cites the number of species found as "bycatch" in NOAA's research traps, however given its acknowledgment that these traps do not have the escape vents required on commercial traps, the relevance of this information is not clear. Further the absolute quantity of this bycatch, as documented in the Council's comprehensive Sustainable Fisheries Act bycatch amendment, is functionally trivial. In addition, NOAA has previously successfully defended this fishery from these precise charges in Federal Court. The statement that rebuilding of the NWHI lobster population may be occurring, but likely not enough to support a substantial fishery is wholly speculative and unsupported by any theory, data or scientific references. Regarding the claim that "Maintaining a closure of the lobster fishery will not create significant additional socio-economic impact because it is not currently in operation and catch declined 90% while the fishery was open - fluctuating dramatically as it dropped", the NWHI lobster fishery is not presently nor permanently closed. To the contrary no harvest guidelines have been issued since 2000 while NOAA resolves uncertainty in its population models. A regulatory closure would indeed have significant additional socioeconomic impacts as it would foreclose opportunities for future harvest by NWHI limited entry lobster fishery permit holders who are still financially vested in the fishery. This would represent a loss not only to those permit holders but also to shoreside support industries, consumers, and Hawaii's economy.

Regarding Objective 7b, associated text contains a series of factual errors and contradictions and fails to acknowledge the Council's recommendations that would address the issues raised. For example it is stated that "Little is known about the size of the standing stock, habitat requirements, growth rates, and many life history traits of targeted species" and "MSY cannot be accurately measured."

To the contrary extensive research has documented that Hawaii's natural populations are relatively stable, and a wide range of age classes are generally present. Further, it is known that western Pacific precious corals share several ecological characteristics: they lack symbiotic algae in tissues (they are ahermatypic) and most are found in deep water below the euphotic zone; they are filter feeders, and many are fan shaped to maximize contact surfaces with particles or microplankton in water column. Most species are uni-sexual or dioecious (sexes are separate) and the age at reproductive maturity is 12-13 years for *secundum* and *dichotoma*, with fertilization appearing to take place in the water column. Western Pacific precious coral larvae are more affected by light and temperature than are adults, with larvae of both *Anipathes* in Hawaii are known to be negatively phototactic which is why they are not found at depths less than 30 meters. The duration of the larval stage is unknown for most species, but Mediterranean studies of *Corallium rubrum* suggest that their larvae remain competent for several weeks. Species of *corallium* exist below the euphotic zone at depths between 350 and 1500 meters where temperature varies between 14 and 3 C. These larvae may avoid settling deeper where lower temperatures may prevent reproduction. Similarly, the lower limit of the *dichotoma* and *grandis* black corals coincides with top of thermocline in the high Hawaii islands. Microzooplankton and particulate organic matter are important in the diets of related *gorgonians*, and like other anthozoan species they are associated with numerous kinds of commensal invertebrates. They are also associated with many species of other anthozoans. They have not been observed to be consistently associated with any kind of finfish or free-swimming invertebrate. Eucidarid sea urchins are known to prey upon precious corals. Because of the great depths at which they live, the precious corals would be expected to be insulated from some short-term drastic changes in the physical environment. For the same reason, it is difficult to imagine circumstances in which man-made pollution would affect their environment, except in the unlikely event that large quantities of heavy material, such as waste from manganese nodule refining, were dumped directly on a bed. Nothing in known of the long-term effects of changes in environmental conditions, such as water temperature or current velocity, on the reproduction, growth, or other life activities of the precious corals. The oldest corals observed at Makapu'u are thought to be 75 years old, and it is believed that black corals may live even longer. Hawaii populations of *Corallium secundum* and *A.dichotoma* appear relatively stable implying a balance between recruitment and mortality. To date, beds of pink, gold and/or bamboo coral have been found at seven locations in the Council's jurisdiction, all in the EEZ around Hawaii. There are also two known major beds of black coral in the Council's area, as well as several minor beds. Most of these are located in Hawaii's state waters, however the largest (the Au'au Channel Bed) extends into the EEZ. The approximate areas of the seven identified beds of precious corals have been determined. These beds are small; only two of them have an area greater than 1 square kilometer, and the largest is 3.6 square kilometers in size. Undocumented reports of large past commercial production by Japanese vessels on the

Milwaukee Banks, some 500 miles beyond the northwestern extreme of the Leeward Hawaiian Islands, and the large physical area of those banks lead to conjecture that precious corals may at some locations occur in much larger aggregations than have as yet been demonstrated by scientific surveys. Asian coral fishers, who have roamed the western and central Pacific for decades, undoubtedly have undocumented and unorganized information on precious coral beds that is unavailable to U.S. researchers and administrators. *Makapu'u Bed:* This bed has experienced the greatest exploitation and thus is the source of much of the available information about the region's precious corals. Estimates of the densities of occurrence of precious coral colonies in their habitat based on in site observations made at the Makapuu Bed, indicated a sparse, widely separated habit of growth. Surveys of this bed were made in the 1970s, and again in 1997. In 1971 densities of commercial species were determined in an unexploited section of the bed and the size frequency distribution of pink coral was determined. The average density of pink coral in the Makapu'u Bed was 0.022 colonies per square meter. Extrapolation of this figure to the entire bed (3.6 million square meters) results in a standing crop of 79,200 colonies. The 95% confidence limits of the standing crop are 47,200 to 111,700 colonies. Conversion of standing crop colonies to biomass produced an estimate of 43,500 kg for *C. secundum* in the Makapu'u Bed. The estimates of density for gold coral (*Gerardia* sp.) and bamboo coral (*Lepidisis olapa*) in the Makapu'u Bed were 0.003 colonies/m^2 and 0.01 colonies/m^2 respectively. However, the distributional patterns of both of these species were found to be very patchy, much more so than *C. secundum*, and the area where they occurred was only about half that for pink coral, or 1.8 m^2. The corresponding estimates of unfished abundance for gold and bamboo colonies were 5,400 and 18,000 colonies respectively. Data for the mean weight of colonies in the populations of gold and bamboo coral in the Makapu'u Bed were lacking, but rough estimates were 2.2 kg for gold coral and 0.6 kg for bamboo coral. Multiplying mean weights by densities led to rough estimates of standing crop of about 11,800 kg for *Gerardia* sp. and 10,800 for *Lepidisis* sp. An analysis of growth rings in the cross sections of pink coral branches suggests that colony height increases about 0.9 cm/year, at least to an age of about 30 years. The largest colonies of pink gold found at Makapu'u were rarely more than 60 cm in height. Gold coral colonies were seen to reach a height of about 250 cm, while *Lepidisis olapa* was observed at about 300 cm. The natural mortality rate for pink coral was calculated by first converting the size-frequency distribution of the unfished stock to an age-frequency distribution and then determining the rate of diminution in progressively older age classes. The best estimate of the annual instantaneous mortality rate of *C. secundum* in the Makapu'u Bed is 0.66. This is equivalent to an annual survival rate of about 93% in the absence of fishing. Mortality rates for gold and bamboo coral were not available because their growth rates and age structures were unknown. Pink corals reach sexual maturity at a height of about 12 cm (13 years). The reproductive cycle is annual with spawning taking place during June and July. The relationship between parent stock and recruitment in pink coral is unknown. However, because pink coral is long lived, and the population is composed of many year-classes, the standing stock should be relatively stable even with moderate year-to-year fluctuations in recruitment. An estimate of steady state recruitment of the unexploited Makapu'u stock was obtained by multiplying the virgin stock size (79,200 colonies) by the best estimate of instantaneous mortality (0.066). Given steady state, the instantaneous rate of recruitment should equal the instantaneous rate of natural mortality. This gives an estimate of recruitment to the Makapu'u Bed of 5,277 colonies. Biomass per recruit as a function of age was calculated in the absence of fishing using a cohort production model. In this model, the cohort gains weight until an age is reached where growth gains are overtaken by natural mortality losses. This is the "critical age" at which the cohort reaches its maximum biomass in the absence of fishing. For pink coral the maximum biomass per recruit, attained by a cohort at age 31.4 years is 237 gm. Maximum sustainable yields for precious corals are calculated using a Beverton and Holt cohort production model where data is available for *Corallium secundum*, and the Gulland Model (MSY = 0.4 M Bo, where m=natural mortality and Bo is virgin biomass) for *Gerardia* and *Lepidisis*. According to the FMP, the estimated MSY for pink coral at Makapu'u Bed is 1,000 kg/yr, the estimated area of Makapu'u Bed is 3.6 km^2 . When fishing is done in such a way that all colonies of a cohort are removed at once, then the yield per recruit is identical to the biomass per recruit at the harvest age. Therefore the maximum yield per recruit is achieved by harvesting all survivors in a cohort of pink coral exactly at the critical age of 31.4 years, and in this case the maximum yield per recruit is 237 gm. In practice this would require an infinite instantaneous fishing mortality rate exactly at 31.4 years. Since this is not feasible, the 237 gm/recruit is a theoretical upper limit to the harvest that may actually be obtained. More realistic figures of yield per recruit are obtained by considering a fishery which applies a steady finite fishing mortality rate to all ages in a cohort above a specified minimum harvest age. With a minimum harvest age of 30 years the maximum yield per recruit is essentially equal to the upper limit of 237 gm, whereas with a minimum harvest age of zero years the greatest yield per recruit possible is only 119 gm. Hence, if non-selective measures are employed, the highest yield per recruit that can be expected is only half the maximum yield per recruit theoretically possible under selective harvesting. As long as recruitment is constant or independent of stock size, a fishing policy which maximizes the yield per recruit will also maximize the total yield on a sustained basis, i.e. it will also produce the maximum sustainable yield. *Brooks Bank Bed:* The current harvest for pink coral at Brooks Bank is 444 kg/yr.[3] This figure was calculated using the following formula provided in the FMP for setting the quota for conditional beds for which site specific data is unavailable.

$$\frac{\text{MSY for Makapu'u Bed}}{\text{Area of Makapu'u Bed}} = \frac{\text{MSY for Conditional Bed}}{\text{Area of Conditional Bed}}$$

The estimated MSY for pink coral at Makapu'u Bed is 1,000 kg/yr, the estimated area of Makapu'u Bed is 3.6 km^2 and the estimated area of Brooks Bank is 1.6 km^2. A survey of this bed was done in September of 1998. Transects on this survey were 2.1 kilometers in length, and conducted at a depth of 350-505 meters. Red coral (*C. regale*) was observed to be very abundant with thousands of colonies present. Colonies occurred in patches from one to five square meters in size, and were located in waters between 430-517 meters deep. These colonies were up to 50 cm in height and averaged 1 cm in diameter. Extrapolation of this data suggests that a conservative standing crop of 8,000 kg of *C. regale* exists at this bed. If it is assumed that this species of precious coral has the same natural mortality rate as *C. secundum* at the Makapu'u Bed (6.6%), an estimate of the MSY can be derived from the

[3] The final rule implementing the FMP published on 20 August 1983 lists the harvest quota for pink coral at Brooks Bank as 17 kg. This is a typographical error.

formula provided by Gulland : MSY = 0.4MB, where M is the natural mortality rate and B is the standing crop biomass. Rounding down, it is estimated that 200 kg of *C. regale* could be harvested annually on a sustainable basis based on these data and assumptions. Pink coral (C. secundum) was observed to be moderately abundant on the east side of the bank at depths of 363-427 meters, but were generally small (less than 20 cm in height). Gold coral was abundant with 250 large colonies found between 392-467 meters. It was estimated that there was a standing stock of 2,000 kg of live gold coral, with an equal amount observed dead. Observations of finfish in the area were rare, and there was no evidence of predation by sea urchins at this bed. *Wespac Bed:* This bed was also surveyed in 1998. Transects of 3.2 km were made between depths of 360-500 meters. No red coral was observed, however pink coral was abundant, with thousands of colonies in patches ranging from 0.3 to 1.0 square meters in size. Gold coral was rare, with only 2 colonies observed. Finfish (mostly Polymixia) were abundant, and there was high predation by Eucidarid sea urchins, with 50% of colonies showing signs of predation. *French Frigate Shoals-Gold Pinnacles Bed:* Using monk seal telemetry, the1998 survey also located a previously unknown bed near French Frigate Shoals which has been named the FFS-Gold Pinnacles Bed. Transects 2.9 km in length at a depth of 360-575 meters found no red coral (*C. regale)*, and a low abundance of pink coral (*C. secundum*.) The pink coral which was observed was generally small, averaging less than 12 cm in height (Grigg 1998b). Both live and dead gold coral was found in abundance, and 300 colonies were observed in scattered patches at depths of 365-406 meters. Extrapolation of the transect data suggests that a standing crop of 3,000 kg of gold coral exists at the FFS-Gold Pinnacles Bed. If it is assumed that this species of precious coral has the same natural mortality rate as *C. secundum* at the Makapu'u Bed (6.6%), an estimate of the MSY can be derived from the formula provided by Gulland (1970): MSY = 0.4MB, where M is the natural mortality rate and B is the standing crop biomass. Rounding down, it is estimated that 80 kg of gold coral could be harvested annually on a sustainable basis based on these data and assumptions. Few finfish were observed at this bed, no arrowtooth eels were seen. *Black coral beds:* Grigg and Apresko reported 14 species of black coral known to occur in Hawaiian waters. Historically however commercial fishermen have harvested only three species, *Anthipathes dichotoma* (almost 90% of commercial harvest), *A. grandis* (10%), and *A. ulex* (1%). The two major species (*A. dichotoma* and *A. grandis*) are found in coastal waters from Hawaii to Niihau and may extend up to the Northwestern Hawaiian Islands. *A dichotoma* exists at depths from 30 to 110 meters while A. grandis exists at depths from 45 to 110 meters. Within their depth ranges, both species can be found highly aggregated on, or under, vertical dropoffs, terraces, or undercut notches. The growth rates for *A. dichotoma* and *A. grandis* have been estimated to be 6.42 cm per year and 6.12 cm per year respectively. Plotting gonad diameter versus colony height, Grigg estimated the size of reproductively mature *A. dichotoma* colonies to range from 64 to 80 cm. This implies an age at reproduction of 10 to 12.5 years.

The document also states that "The importance of deep-water precious coral beds as a refuge for eels and bottomfish, and consequently as monk seal foraging habitats is unresolved and may be significant." We do not disagree with this statement, however the document fails to acknowledge that monk seal foraging has been associated with deep-water gold corals and that in response the Council's recommendation would prohibit all harvest of NWHI gold corals, as well as prohibiting harvests of any precious corals at the French Frigate Shoals bed.

Instead Objective 7b (as well as NMSP Alternative 3) proposes to prohibit all NWHI precious corals harvests, again relying on vague and unsupported statements that such activity would be "considered inconsistent with the relevant provisions of the NMSA and goals for the proposed sanctuary" rather than providing a detailed analysis of available information, likely impacts of each alternative, and a rationale as to the necessity of a blanket prohibition. In addition, the statement that the closure of this fishery would likely have no socioeconomic impacts again ignores the fact that this would lead to the loss of the opportunity to harvest available resources and represent a loss not only to future fishery participants but also to shoreside support industries, consumers, and Hawaii's economy. In all cases, evaluation of impacts must consider not only impacts on the current generation, but impacts that will be felt by future generations.

Regarding Objective 7c the document lacks an assessment of the specific impacts of such harvests on the ecosystem or a rationale for the necessity of a prohibition of these activities. Reference is made to adverse impacts resulting from historical fisheries however no acknowledgement is made that these were largely unregulated fisheries as compared to the carefully controlled coral reef fisheries recommended by the Council. Again the document takes the position that managers are faced with an "all or none" choice in which fisheries are either completely unregulated or closed. This ignores the many management techniques in use by fishery managers to allow controlled harvests of marine resources such that socioeconomic benefits are maximized while adverse ecological impacts are avoided. Analysis of Objective 7 (and NMSP Alternative 3) again includes the statement that the closure of this fishery would likely have no socioeconomic impacts. This ignores the fact that this would lead to the loss of the opportunity to harvest available resources and represent a loss not only to future fishery participants but also to shoreside support industries, consumers, and Hawaii's economy.

Objectives 7d, 7e, 7f, 7h, and 7i would allow various types of fishing "except within sensitive habitats". Because the term "sensitive habitats" is undefined, these objectives are highly subjective and their rationale, desirability, necessity and impacts are impossible for decision makers and the public to gauge.

Other issues surrounding Objectives 7e and 7g are discussed above.

Objective 7j conflicts with the NMSA's implementing regulations which state that "all activities (e.g. fishing, boating, diving, research, education) may be conducted unless prohibited or otherwise regulated...". Clearly the intent of this statement is to clarify that the default position is that activities are allowed unless specifically prohibited, however Objective 7g would take the reverse position and prohibit all activities unless specifically allowed.

The Council supports Objective 7k as stated, however the associated text indicates that the NMSP interprets this to mean that managers are faced with an "all or none" choice in which fisheries are either completely unregulated or closed. Again, this ignores the many management techniques in use by fishery managers to allow controlled harvests of marine resources such that socioeconomic benefits are maximized while adverse ecological impacts are avoided. In addition, the document lacks any discussion regarding what scientific information is needed to assess the impacts of activities on the NWHI ecosystem, nor is there a proposition for scientific research and long-term monitoring to improve management and decision making. Without such research, fisheries will remain forever closed due to "uncertainty in available information".

In conclusion, the objectives of Goal 7 read as very specific regulatory language which restricts flexibility in management approaches. The objectives of Goal 7 should be rewritten to describe the desired state of the sanctuary and not prescribe mechanisms to achieve that state. Therefore Goal 7 and its associated objectives should be revised as follows:

Goal 7: Maintain ecosystem integrity by applying ecosystem-based management and research principles to fishing activities. Sustain ecosystem protection while minimizing adverse socioeconomic impacts

Objectives:

7a. Protect ecosystem integrity by applying a precautionary approach and continuing research on crustaceans and precious corals fisheries to determine if, and how, harvests can be allowed without damaging the integrity of the NWHI ecosystem.

7b. Protect the substrate of the NWHI ecosystem through prohibitions on the collection of reef building corals and live rock.

7c. Protect ecologically valuable areas from damage resulting from fishing activities, consistent with available biological and ecological information.

7d. Protect Hawaiian monk seals, sea turtles, seabirds and other protected wildlife by controlling fishing activities in areas where interactions are known to occur.

7e. Maintain ecosystem integrity by controlling the harvests of pelagic, botttomfish, and coral reef associated species consistent with available biological and ecological information.

7f. Maintain ecosystem integrity while minimizing adverse socioeconomic and cultural impacts.

7g. Employ principles of equity and fairness when allocating fishing rights.

7h. Protect Native Hawaiian cultural rights by promoting access for non-commercial fishing uses by Native Hawaiians to the extent possible without damaging the integrity of the NWHI ecosystem.

7i. Promote increased understanding of the NWHI ecosystem through comprehensive and coordinated research.

7j. Apply ecosystem-based principles through coordinated management with NWHI management and research partners.

Reviewers provided comments on other sections of the document as follows:

The specific methodology underlying the development and application of "screening criteria" is poorly described, circular, and does not withstand scientific scrutiny. For example nowhere does the document assess how various activities would actually impact NWHI marine resources, instead "sensitive ecological areas" are identified based on loosely identified criteria and subjectively ranked. These are then compared to a "bottomfish ranking" of areas in the NWHI which is based on the purported pounds landed from each area. Not only are the landings data incorrect for several areas, there is no consideration given to variations in value by species or interannual variations. Following these ranking exercises, areas in which ecological ranking is "high" while bottomfish ranking is "low" are recommended to be closed despite the lack of any information that bottomfishing has any actual adverse impacts on the area's resources. Lobster, precious coral and coral reef fisheries are summarily dismissed as inconsistent with the sanctuary's goals.

In the analyses of fishing alternatives commercial fisheries are required to meet a "burden of proof" that fishing activity does not affect ecosystem/ecological integrity. This policy is not embodied or required in the NMSA or the Goals and Objectives of this Sanctuary. Further, this requirement can never be realized unless there is a definition of ecosystem/ecological integrity and a quantitative threshold for the level of harm. In addition, recreational catch and keep requires reporting while recreational catch and release, sustenance, and Native Hawaiian cultural and subsistence use do not require reporting, yet all involve fish mortality. Also, no caps are proposed for these activities nor do they need to meet the same "burden of proof" required of commercial fishing. Such inconsistencies reveal a lack of a well thought out analytical or management approach to the proposed sanctuary.

The document relies heavily on concerns for monk seals, sea turtles and seabirds, however it largely fails to acknowledge the existence of extensive research and monitoring programs indicating that NWHI fisheries have little to no interactions with these species and that there is no evidence linking these fisheries to adverse impacts on protected or endangered species. In another instance of self-contradiction, although the existing Biological Opinion on the lack of impacts of the NWHI bottomfish fishery on endangered species is noted, the document nevertheless cites concerns for monk seals as a significant reason for constraining this fishery.

The document also contains numerous unsupported statements. For example the document states, "Nevertheless, current fishery management practices, interactions with monk seals, overfishing of susceptible species, and impacts to the coral reef environment have been voiced as ongoing concerns." No citation or supporting evidence is given for this provocative statement.

Similarly the document states, "Others have noted concern over fishing for *uku* and *hapu'u* because they are reef-related species, as opposed to *onaga, opakapaka and ehu*, which are deep slope species." Again, no citations or supporting evidence are provided for this vague statement.

In summary, reviewers found the document to lack a coherent analytical or management framework and to appear to have been written to fulfill a pre-existing agenda to severely restrict (and ultimately prohibit) all commercial fishing in the NWHI. Given the lack of supporting documentation that such activities would inherently threaten or damage the area's marine resources, this agenda must be seen as a philosophical opposition to commercial fishing. While such philosophies are certainly legitimate, they should be clearly and publicly debated rather than hiding behind pseudo-analyses and ambiguous presentations that leave decision makers, fishery participants, managers and the public confused and misinformed as to the necessity and impacts of such initiatives. This document is wholly inadequate in its description, rationale and analyses of management measures for the proposed NWHI sanctuary and should not be relied upon for any rational decision making concerning NWHI resource management.

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary of Commerce
for Oceans and Atmosphere
Washington, D.C. 20230

OCT 24 2005

Mr. Frank McCoy
Chair
Western Pacific Fisheries Management Council
1164 Bishop Street, Room 1400
Honolulu, Hawaii 96813

Dear Chairman McCoy:

Over the past year, the National Oceanic and Atmospheric Administration (NOAA) has made significant progress towards designation of the Northwestern Hawaiian Islands (NWHI) Coral Reef Ecosystem Reserve as a sanctuary under the National Marine Sanctuaries Act (NMSA). As part of that process, we have sought the Council's views, and in particular, the Council's recommendations for regulation of fishing in the proposed Sanctuary.

I appreciate the Council's work in developing proposed fishing regulations, as reflected in the April 14, 2005, "Recommendation of the Western Pacific Fishery Management Council (WPFMC) regarding the Management of Fisheries within the Proposed Northwestern Hawaiian Islands National Marine Sanctuary" (Recommendation). NOAA's National Marine Sanctuary Program and NOAA's National Marine Fisheries Service have carefully reviewed and considered the Recommendation. After careful and thorough review, however, NOAA finds the Recommendation does not fulfill the purposes and policies of the NMSA, and the goals and objectives of the proposed NWHI sanctuary. The rationale for this finding is provided in the attached document.

While this finding concludes the NMSA 304(a)(5) process for purposes of the proposed sanctuary designation, we welcome the Council's continued participation as NOAA moves toward designation and development of necessary regulations under the NMSA. The information and analysis provided by the Council in its Recommendation, as well as additional information from public meetings and meetings with fishing constituents, has already been valuable in developing the draft environmental impact statement (DEIS). NOAA is developing DEIS alternatives that will enable WPFMC to continue to recommend management measures for commercial bottomfish/pelagic fishing in the NWHI under the Magnuson-Stevens Fishery Conservation and Management Act consistent with the goals and objectives of the proposed sanctuary. Under this approach, the Council will be provided with an opportunity to develop the fishing regulations through an amendment to an existing, or a new fishery management plan. We hope the Council will continue to work with us in this regard.

THE ADMINISTRATOR

Mr. Frank McCoy
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I want to extend my sincere appreciation for the hard work the Council and Council staff have contributed toward the sanctuary designation process. We look forward to continuing our collaborative efforts as we complete that process.

Sincerely,

Conrad Lautenbacher

Conrad C. Lautenbacher, Jr.
Vice Admiral, U.S. Navy (Ret.)
Under Secretary of Commerce for
Oceans and Atmosphere

Enclosure

Finding on the Recommendation of the Western Pacific Fishery Management Council Regarding the Management of Fisheries within the Proposed Northwestern Hawaiian Islands National Marine Sanctuary

October 2005

U.S. Department of Commerce
National Oceanic and Atmospheric Administration

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PROPOSED NORTHWESTERN HAWAIIAN ISLANDS NATIONAL MARINE SANCTUARY

Finding on the Recommendation of the Western Pacific Fishery Management Council Regarding the Management of Fisheries within the Proposed Northwestern Hawaiian Islands National Marine Sanctuary

1.0 FINDING

In accordance with section 304(a)(5) of the National Marine Sanctuaries Act (NMSA), 16 U.S.C. 1434(a)(5), NOAA provided the Western Pacific Fishery Management Council (WPFMC) the opportunity to prepare draft NMSA regulations for fishing to fulfill the goals and objectives (G&O) of the proposed Northwestern Hawaiian Islands (NWHI) national marine sanctuary designation and the purposes and policies (P&P) of the NMSA.

Under section 304(a)(5) of the NMSA, a Council may either: (1) prepare NMSA draft fishing regulations that fulfill the P&P of the NMSA and G&O of a proposed sanctuary designation; or (2) make a determination that draft NMSA regulations for fishing are not necessary. Regulations provided by a Council, or a determination that regulations are not necessary, shall be accepted and issued as proposed regulations unless NOAA finds they do not fulfill the P&P of the NMSA and G&O of the proposed designation. Further, section 304(a)(5) requires NOAA to prepare the fishing regulations if the Council declines to make a determination with respect to the need for regulations, makes a determination which is rejected by the NOAA, or fails to prepare the draft regulations in a timely manner

Per Section 304(a)(5) of the NMSA, WPFMC provided its "Recommendation of the Western Pacific Fishery Management Council Regarding the Management of Fisheries within the Proposed Northwestern Hawaiian Islands National Marine Sanctuary" (WPFMC Recommendation) on April 14, 2005, (WPFMC 2005a). WPFMC recommended a proposed regulatory regime under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as opposed to draft fishing regulations under the NMSA. NOAA considers WPFMC's Recommendation to be its determination that regulations for fishing under the NMSA are not necessary because WPFMC believes their recommended regulatory regime under the MSA fulfills the P&P of the NMSA and G&O of the proposed NWHI sanctuary.

NOAA finds WPFMC's Recommendation does not fulfill the P&P of the NMSA and G&O of the proposed NWHI sanctuary. The rationale for this finding is provided in this document. This finding concludes the NMSA 304(a)(5) process for the purpose of the proposed sanctuary designation.

Per section 304(a)(5), because NOAA finds the WPFMC's Recommendation does not fulfill the P&P of the NMSA and G&O of the proposed NWHI sanctuary, and therefore does not accept WPFMC's Recommendation, NOAA must prepare draft NMSA regulations for fishing in the proposed sanctuary. In doing so, NOAA will incorporate any new information and data from scientific studies, meetings with the fishing community, and federal and state regulatory actions. Draft regulations will be included with the Draft Environmental Impact Statement (DEIS) for public comment as required by the NMSA and in accordance with the National Environmental Policy Act (NEPA). This document summarizes the NMSA 304(a)(5) process and provides the rationale for this finding.

2.0 BACKGROUND ON SECTION 304(a)(5) PROCESS

Under Section 304(a)(5) of the NMSA, 16 U.S.C. 1434(a)(5), regional fishery management councils are provided the opportunity to prepare draft NMSA regulations for fishing that fulfill the P&P of the NMSA and G&O of sanctuary designation. This provision specifically recognizes regional fishery management councils have considerable expertise in developing fishing regulations and could provide valuable assistance to NOAA in developing draft NMSA regulations for fishing in the proposed NWHI sanctuary.

Section 304(a)(5) of the NMSA provides the regional fishery management council an opportunity to draft regulations that fulfill the G&O of the proposed sanctuary designation and the P&P of the NMSA. Regional fishery management councils have 120 days to respond to the NMSA 304(a)(5) opportunity (15 C.F.R Section 922.22(b)). Draft regulations prepared by the Council shall be accepted and issued as proposed Sanctuary regulations unless NOAA determines they fail to fulfill the P&P of the NMSA and G&O of sanctuary designation. Further, section 304(a)(5) requires NOAA to prepare the fishing regulations if the Council declines to make a determination with respect to the need for regulations, makes a determination which is rejected by the NOAA, or fails to prepare the draft regulations in a timely manner.

The G&O of sanctuary designation, together with the P&P of the NMSA, serve as the benchmarks against which a regional fishery management council's draft regulations, or determinations regulations are not necessary, are measured. The proposed NWHI sanctuary's G&O Statement describes the sanctuary vision (SV) and mission (SM), and management principles (MP), goals, and objectives for the proposed sanctuary (Attachment A). While all the G&O are used to evaluate the WPFMC Recommendation, management goal 7 relates specifically to fishing. The G&O Statement for the proposed NWHI sanctuary designation was developed using the advice of the NWHI Coral Reef Ecosystem Reserve Advisory Council (RAC) and RAC subcommittees, interagency partners, and the public through a series of meetings over the period of approximately one year beginning in July 2003, (NOAA 2004). The language is based largely on the P&P of the NMSA and the Executive Orders 13178 and 13196 (EO), and supplemented by reference to multiple documents including scoping comments, the draft interagency memorandum of understanding, and the Hawaii State Constitution. The WPFMC, as a nonvoting member of the RAC, participated in the RAC and its subcommittee meetings throughout the development of the G&O Statement and possible fishing alternatives for the NWHI.

Prior to the initiation of the NMSA 304(a)(5) process, WPFMC requested NOAA conduct an analysis of the 2003 WPFMC proposal for managing fisheries in the proposed NWHI sanctuary (WPFMC 2003) and provide guidance on developing draft regulations for fishing that would meet the G&O of the proposed sanctuary designation. As part of this analysis, NOAA utilized screening criteria based on the P&P of the NMSA and G&O of sanctuary designation to evaluate the potential range of fishing activities and overall regulatory regimes. Screening criteria were used to score the compatibility of fishing activities and a range of fishing alternatives against the P&P of the NMSA and G&O of the proposed sanctuary designation. Fishing activities and alternatives receiving negative total scores based on the evaluation were deemed incompatible with the P&P of the NMSA and G&O of the proposed sanctuary designation.

On September 20, 2004, NOAA initiated the NMSA 304(a)(5) process. NOAA provided its analysis along with the G&O Statement and model regulations that appeared to best fulfill the G&O of the proposed designation (NOAA 2004) as input to WPFMC for the development of draft fishing regulations.

Upon request, WPFMC was granted two extensions to the 120-day response period to conduct public meetings, facilitate its process, and incorporate the results of public comment and the WPFMC process into any draft fishing regulations. WPFMC held public meetings on the islands of Oahu, Maui, Kauai, and Hawaii. On April 14, 2005, WPFMC submitted its "Recommendation of the Western Pacific Fishery Management Council Regarding the Management of Fisheries within the Proposed Northwestern Hawaiian Islands National Marine Sanctuary" (WPFMC Recommendation; WPFMC 2005a). NOAA analyzed the WPFMC Recommendation utilizing a similar approach and criteria as in the earlier analysis of WPFMC's 2003 proposal (NOAA 2004) as the basis and rationale for this finding.

3.0 RATIONALE FOR FINDING

The WPFMC Recommendation is largely based on its 2003 proposal for fishing in the proposed sanctuary (WPFMC 2003) submitted to NOAA prior to the initiation of the NMSA 304(a)(5) process. NOAA compared the WPFMC Recommendation to the earlier proposal to identify new or modified provisions (Table 1). Key new provisions proposed in the WPFMC Recommendation are summarized below:

- Moratoria on coral reef, precious coral, and crustacean fisheries pending opening via a Fisheries Ecosystem Management Plan developed under MSA
- Community Development Program (CDP) permits for Native Hawaiians with exemptions from moratoria on coral reef, precious coral, and crustacean fishing
- Maximum number of bottomfish permits established
- Permits and reporting requirements for pelagic trolling

NOAA reviewed the WPFMC Recommendation and found it fails to fulfill the G&O of the proposed sanctuary and P&P of the NMSA. This section provides the rationale for NOAA's finding focusing on the six fishing activities proposed by WPFMC. NOAA finds the recommendations associated with each of these fishing activities do not fulfill the G&O of the proposed sanctuary and the P&P of the NMSA.

In addition to the concerns associated with these individual fisheries described below, the primary purpose of any sanctuary designation, particularly the NWHI proposed sanctuary designation, is resource protection (NMSA P&P 6); (SM and MP7). The G&O of sanctuary designation highlight the need to limit and control fishing (Goal 7), and limit access only to those activities consistent with long-term ecosystem protection (MP 7; Objective 3a).

The WPFMC Recommendation, however, would only establish a near-term moratorium on the commercial precious coral, coral reef species and crustacean fisheries pending the development of a fishery ecosystem management plan. This approach fails to identify the criteria that would be used to end, or the nature of the specific process for ending, the moratorium. For example, the Recommendation identifies development of an ecosystem fishery management plan as a basis for ending the moratorium, but there are no details as to what would constitute a plan sufficient to lift the moratorium. This lack of information also raises a significant concern as to whether the WPFMC could issue an ecosystem management plan meeting the statutory and regulatory requirements of the MSA that would also fulfill the G&O of the proposed sanctuary designation or the P&P of the NMSA. Absent these types of critical information, the WPFMC Recommendation fails to provide limits or controls necessary to maintain ecosystem integrity (Goals 3 and 7; Objective 3a).

Table 1. WPFMC 2003 Submittal and New Provisions of WPFMC Recommendation in Response to the NMSA 304(a)(5) Process

Fishery	WPFMC 2003 Proposal (WPFMC 2003)	WPFMC Recommendation (WPFMC 2005a)
Commercial Longlining	• Area restriction on commercial longlining in protected species zone [CFR 660.12]	• No changes indicated
Commercial precious coral fishing	• Three conditional beds (of which one is proposed), one exploratory area, and one refuge within NWHI EEZ [CFR 660] • Open-access permits are bed-specific [CFR 660.81(b)] • Only one permit is valid per vessel and per person [CFR 660.81(c-d)] • Bed/Area-specific harvest quotas for each species present [CFR 660.84] • Minimum size restrictions for pink and black coral [CFR 660.86] • Must harvest with selective gear [CFR 660.88] • Mega-refugium, 250 nm long extending from existing Westpac refuge to southeast Brooks bank, where all precious coral harvest is prohibited (proposed) • Minimum size restriction (4 feet height, 1.5 inch base diameter) for gold coral harvest (proposed) • No harvest of gold coral in NWHI (proposed) • Observers required as directed by NMFS (proposed) • Harvest restriction within exploratory area adjacent to conditional beds (proposed) • Permittees may only harvest every other legal size coral when harvesting in the exploratory area, thus leaving at least 50 percent of the standing stock of an undesignated bed (proposed)	• Would establish a moratorium pending the development of a fishery ecosystem management plan by the WPRFMC and implemented by NOAA Fisheries under the MSFCA
Commercial coral reef species fishing	• Special permit required, issued on a case-by-case basis [CFR 660.602] • Federal reporting requirement [CFR 660.602(d)(3)] • Fishing permitted only with list of allowable gear [CFR 660.605] • Harvesting of live coral or live rock prohibited, except for research, as aquaculture seed stock or for traditional and ceremonial purposes [CFR 660.603(c)]	• Would establish a moratorium pending the development of a fishery ecosystem management plan by the WPRFMC and implemented by NOAA Fisheries under the MSFCMA
Commercial crustacean Fishing	• 15 "lifetime" limited access permits [CFR 660.41(d)] • Permits may be transferred or sold [CFR 660.41(e)] • 3 Federal reporting requirements: catch, sales and packing/weigh-out reports [CFR 660.14] • Closed season: 1 Jan – 30 June [CFR 660.45 (a)]	• Would establish a moratorium pending the development of a fishery ecosystem management plan by the WPRFMC and implemented by NOAA Fisheries under the MSFCA

Fishery	WPFMC 2003 Proposal (WPFMC 2003)	WPFMC Recommendation (WPFMC 2005a)
	• Lobster no-take zone within 20 nm of Laysan and within the 10 fm curve of all emergent land [CFR 660.46] • Gear restricted to traps (with design requirements) or hand harvest [CFR 660.48 (a)(1-4)] • Maximum number of traps of 1,200 for each vessel [CFR 660.48(a)(5)] • VMS unit required if lobster trap gear is onboard a vessel operating in Permit Area 1 when fishing for lobster is prohibited [CFR 660.48(a)(7-8)] • Observers required as directed by NMFS [CFR 660.49] • Annually determined area-based harvest guideline for four lobster fishing grounds [CFR 660.50]	

Commercial bottomfishing and associated pelagic trolling	• 17 permits can be issued: 10 in Mau zone (includes potential for two CDP permits) and 7 in Ho'omalu zone – Additional permits could be issued if the Regional Administrator, in consultation with the Council, determines that bottomfish stocks can support additional fishing effort [CFR 660.61(f)].
	• No vessel may have valid permits for the Mau and Ho'omalu zone simultaneously [CFR 660.61(a)(2)]
	• Automatic permit renewal with no minimum landing requirements (proposed)
	• No fee for permit renewal (proposed)
	• Any vessel that fished in any year from 2000-2004 and did not renew their permit in any subsequent year will be issued an automatically annually renewed permit (applies to one vessel from each zone, proposed)
	• Mechanism for issuance of new Mau zone permits specifically defined (proposed)
	• Mechanism to issue new Ho'omalu zone permits [CFR 660.61(g)]
	• Permits are non-transferable to a new owner [CFR 660.61(c)]
	• State-required landings logbook must be available for Federal inspection and copying by an authorized officer [CFR 660.14(f)(3)]
	• Observers required as directed by NMFS [CFR 660.65]
	• Primary operators must complete a protected species workshop [CFR 660.61(g)(1)(iv) and 660.61(h)(1)(viii)]
	• Maximum vessel length: 60 ft [CFR 660.61(d) and 660.61(i)(2)]
	• Moratorium on Hancock seamount groundfish [CFR 660.68]
	• No harvest caps
		• Mostly procedural changes related to re-issuance of permits
		• Only substantive difference would set maximum number of permits as follows:
		  • 7 permits in the Ho'omalu zone
		  • 10 permits in the Mau zone with 2 of 10 as CDP

Fishery	WPFMC 2003 Proposal (WPFMC 2003)	WPFMC Recommendation (WPFMC 2005a)
Commercial pelagic trolling and handlining	• Open access fishery (no permit required) • No maximum number of vessels • No harvest limits • No mechanism to place observers on vessels	• Permit required • Federal logbook reporting requirement • Observers required as directed by NMFS • Primary operators must complete a protected species workshop
Subsistence Fishing	• Open access fishery (no permit required) • No reporting requirement	• Subsistence CDP permit required, no fee (permit specific for precious coral, crustacean and coral reef species) • This permit provides an exemption to moratorium for precious corals, coral reef species, and crustaceans • No reporting requirement described
Recreational fishing	• Open access fishery (no permit required) • No reporting requirement	• No change in proposed management
Area Restrictions common to all FMPs	• No-take MPAs: within the EEZ landward of the 10 fathom curve, within the EEZ landward of the 50 fathom curve around Laysan, FFS and the north half of MANWR • Prohibits all fishing including subsistence fishing	• No change in proposed management

NOTE: Summary of WPFMC 2003 proposal and WPFMC 2005 Recommendation for managing fisheries in the proposed NWHI national marine sanctuary. The WPFMC Recommendation column displays changes made in WPFMC 2003 proposal in response to the NOAA's advice and recommendations (NOAA 2004) initiating the NMSA 304(a)(5) process.

3.1 COMMERCIAL PRECIOUS CORAL FISHING

The draft MSA regulations for commercial precious coral fishing in the WPFMC Recommendation fail to fulfill the P&P of the NMSA and G&O of the proposed sanctuary designation. The G&O of sanctuary designation called for a prohibition of commercial precious coral fishing as appropriate to maintain the natural character and biological integrity of ecosystems of the region (Objective 7b). The rationale for this finding and related elements of the G&O (Exhibit 1) are provided below.

While there is some uncertainty as to the extent to which deep-water precious coral beds serve as refuge for eels and bottomfish, and consequently as monk seal foraging habitats, there is a reasonable basis to conclude they are relevant to the management and health of the critically endangered Hawaiian monk seal population (Parrish et al 2002). Moreover, precious corals together with reef-building corals are coral species defining the habitat of shallow and deepwater marine ecosystems and serve as the biological and physical foundation for designating the area as a national marine sanctuary (SV). The significance of the precious coral beds to maintaining the natural character and biological integrity of the region's ecosystems demonstrates it is appropriate to prohibit commercial precious coral fishing, consistent with Objectives 7b and 7c.

Prohibiting commercial precious coral fishing is also necessary given the uncertainty of impacts associated with such activity, and the need to err on the side of resource protection in the face of such uncertainties (MP6; Objectives 1b, 7k). No precious coral fishery has ever occurred in the NWHI. Except for a limited number of observations, little is known about the size of standing stock, distribution, growth rates, and life history traits of precious corals in the NWHI. As such, information and data for the estimation of basic precious coral fisheries management parameters, let alone ecosystem management parameters, are absent and may be difficult to estimate for the NWHI. A prohibition is further supported by recent concerns over the black coral fishery in the main Hawaiian Islands. The black coral fishery in the main Hawaiian Islands is over 40 years old and considered to have the best information and data on these resources in the world (WPFMC 2005b). Despite this information and data, recent recommendations from WPFMC call for changes in management measures to avert serious problems with the black coral fishery in the main Hawaiian Islands due to recruitment failures from overfishing and invasive species (WPFMC 2005b).

The WPFMC's proposal would place a moratorium on this fishery. If the moratorium were a permanent one, it would have fulfilled the G&O of the proposed sanctuary, and particularly the primary purpose of resource protection (NMSA P&P 6; SM; and MP 7), and the G&O highlighting the need to limit and control fishing (Goal 7; Objectives 7b, 7c) and limit access only for activities consistent with long-term ecosystem protection (MP 7; Objective 3a). The proposed moratorium, however, would be for the near term only, and lifted once WPFMC adopts an "ecosystem based management plan" for the fishery. It therefore fails to fulfill the G&O of the proposed sanctuary for two reasons. Allowing any commercial precious coral fishing is at odds with the G&O of the proposed sanctuary for the reasons noted in the preceding paragraphs of this Section. Moreover, as explained more fully in the introduction to Section 3.0 above, establishing the intent to open a commercial precious coral fishery in the NWHI through the development of a fishery management plan lacking key details fails to provide limits or controls necessary to maintain ecosystem integrity, particularly given the uncertainty of impacts associated with such fishing (Objectives 1b, 3a, 7b, 7c and 7k).

EXHIBIT 1. KEY ELEMENTS OF GOALS AND OJECTIVES RELATED TO COMMERICAL PRECIOUS CORAL FISHING

Goals and Objectives

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

1b. When there is uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

3a. Allow access only for activities consistent with long-term ecosystem protection.

Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas minimizing or preventing interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7b. Prohibit commercial precious coral fishing.

7c. Prohibit harvest of all coral species, live rock, all aquaria species and live fish trade species, and algae, sponges, and other invertebrates.

7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

3.2 COMMERCIAL CORAL REEF SPECIES FISHING

The draft MSA regulations for commercial coral reef species fishing in the WPFMC Recommendation fail to fulfill the P&P of the NMSA and G&O of the proposed sanctuary designation. The G&O of sanctuary designation call for a prohibition of commercial coral reef species fishing as appropriate to maintain the natural character and biological integrity of ecosystems of the region (Objective 7c). The rationale for this finding and related elements of the G&O (Exhibit 2) are provided below.

Coral reef ecosystems of the NWHI provide important habitat and foraging grounds for threatened and endangered species including Hawaiian monk seals, fledgling seabirds, and nesting threatened green sea turtles. Protection of these coral reef ecosystems is the core of this sanctuary's proposed designation (SV). The available scientific record readily demonstrates the coral reef ecosystems are significant to maintaining the natural character and biological integrity of the region's ecosystems; their significance readily supports the conclusion it is appropriate to prohibit commercial coral reef species fishing, consistent with Objective 7c.

This conclusion is alternatively well supported by prior experience with this fishery. Past attempts to harvest coral reef species in the NWHI experienced sudden collapses and required decades for even partial recoveries (Friedlander et al., 2005), and as a consequence, the harvest of live rock and live coral is currently prohibited by both state and federal regulations (Hawaii Administration Rules [HAR], 1995;

WPRFMC, 2001a). Marine debris, coral bleaching, disease, and invasive aquatic species are some of the threats to the status of coral reef ecosystems in the NWHI, even in the absence of any harvest of coral reef species (Friedlander et al., 2005). The available evidence supports the conclusion allowing commercial harvesting of coral reef species would likely result in a significant, adverse impact to the proposed sanctuary's ecosystem, and should be prohibited to maintain the natural character and biological integrity of the region's ecosystem, consistent with Objective 7c.

The WPFMC's proposal would continue the existing moratorium on this fishery. If the moratorium were a permanent one, it would have fulfilled the G&O of the proposed sanctuary, and particularly the primary purpose of resource protection (NMSA P&P 6; SM, MP7), and the G&O highlighting the need to limit and control fishing (Goal 7; Objective 7c) and limit access only for activities consistent with long-term ecosystem protection (MP7, Goal 3, Objectives 3a). The proposed moratorium, however, would be for the near term only, and lifted once WPFMC adopts an "ecosystem based management plan" for the fishery. It therefore fails to fulfill the G&O of the proposed sanctuary for two reasons. Allowing any commercial coral reef species fishing is at odds with the G&O of the proposed sanctuary for the reasons noted in the preceding paragraphs of this Section. Moreover, as explained more fully in the introduction to Section 3.0 above, establishing the intent to open a commercial coral reef species fishery in the NWHI through the development of a fishery management plan lacking key details fails to provide limits or controls necessary to maintain ecosystem integrity (Objectives 1b, 3a and 7c).

EXHIBIT 2. KEY ELEMENTS OF GOALS AND OJECTIVES RELATED TO COMMERICAL CORAL REEF SPECIES FISHING

Goals and Objectives

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

1b. When there is uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

3a. Allow access only for activities consistent with long-term ecosystem protection.

Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas minimizing or preventing interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7c. Prohibit harvest of all coral species, live rock, all aquaria species and live fish trade species, and algae, sponges, and other invertebrates.

7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

3.3 COMMERCIAL CRUSTACEAN FISHING

The draft MSA regulations for commercial crustacean fishing in the WPFMC Recommendation fail to fulfill the P&P of the NMSA and G&O of the proposed sanctuary designation. The G&O of sanctuary designation call for a prohibition of commercial crustacean fishing as appropriate to maintain the natural character and biological integrity of ecosystems of the region (Objective 7a). The rationale for this finding and related elements of G&O (Exhibit 3) are provided below.

As with commercial coral reef species fishery, the conclusion that it is appropriate to prohibit commercial crustacean fishing is well-supported by prior experience. Almost 30 years of commercial crustacean fishing demonstrates that allowing it to resume would risk further deterioration of the health of these stocks and disruption to the health of the region's ecosystems. Since the commercial crustacean harvest began almost 30 years ago, fishery managers have attempted to address a continuous stream of ecological concerns brought on by the fishery. The crustacean fishery has undergone a series of closures beginning with two emergency actions in 1991 in response to indications that NWHI lobster stocks were approaching an overfished condition (56 FR 21961 and 36912). The fishery was reopened in 1992 under new harvest guidelines, but then closed for the entire 1993 season with a second emergency closure issued eight weeks into the 1994 season (59 FR 44341). The fishery was again opened in 1995, but only to a single vessel under an experimental fishing permit to assess stock conditions, and closed again in 2000 because of shortcomings in understanding the dynamics of the NWHI lobster populations, increasing uncertainty in population model parameter estimates, and the lack of appreciable rebuilding of the lobster population despite significant reductions in fishing effort throughout the NWHI (65 FR 39314). The closure has continued through 2005 as a precautionary measure to prevent overfishing (70 FR 8544).

Demonstrated ecosystem impacts have occurred in the form of a species shift with slipper lobsters displacing spiny lobsters in traditional spiny lobster habitat. Recruitment failures from overfishing combined with changes in marine productivity in the region are considered the primary factors responsible for this ecosystem impact (Polovina et al. 1995). In addition, the lobsters' metapopulation structure is considered highly vulnerable to rapid depletion under the combined strain of environmental variability and fishing pressure (Dinardo and Marshall 2001).

One of the most studied fisheries in the NWHI, the documented history of commercial crustacean fishing activity and its management is characterized by a boom and bust fishing cycle, unknowns regarding vulnerability of the species to natural and anthropogenic perturbations, ecological impact of slipper lobsters displacing spiny lobsters in traditional spiny lobster habitat in the fishery, potential ecosystem threats to the habitat and reef species, and a likely importance of lobsters in the monk seal diet. Despite the research and adaptive management approach, ecosystem impacts have occurred and the resource has yet to recover from a catastrophic collapse, demonstrating this fishery cannot be sustained in a manner to address ecosystem-level requirements for the proposed NWHI sanctuary. It is therefore appropriate to prohibit commercial crustacean fishing to maintain the natural character and biological integrity of the region's ecosystem, particularly when there is uncertainty in available information regarding some of the potential impacts of that activity (e.g., importance of lobsters to the monk seal diet) (MP 6; Objectives 1b, 3a, 7a and 7k).

The WPFMC's proposal would place a moratorium on this fishery. If the moratorium were a permanent one, it would have fulfilled the G&O of the proposed sanctuary, and particularly the primary purpose of resource protection (NMSA P&P 6; SM and MP7), and the G&O highlighting the need to limit and control fishing (Goal 7) and limit access only to activities consistent with long-term ecosystem protection (MP 7; Goal 3; Objective 3a). The proposed moratorium, however, would be for the near term only, and lifted once WPFMC adopts an "ecosystem based management plan" for the fishery. It therefore fails to fulfill the G&O of the proposed sanctuary for two reasons. Allowing any commercial crustacean fishing is at odds with the G&O of the proposed sanctuary for the reasons noted in the preceding paragraphs of this Section. Moreover, as explained more fully in the introduction to Section 3.0 above, establishing the intent to open a commercial crustacean fishery in the NWHI through the development of a fishery management plan lacking key details fails to provide limits or controls necessary to maintain ecosystem integrity, particularly given the uncertainty with respect to some impacts associated with such fishing (Objectives 1b, 3a, 7a and 7k).

EXHIBIT 3. KEY ELEMENTS OF GOALS AND OJECTIVES RELATED TO COMMERICAL CRUSTACEAN FISHING

Goals and Objectives

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

1b. When there is uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

3a. Allow access only for activities consistent with long-term ecosystem protection.

Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas minimizing or preventing interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7a. Prohibit non-subsistence crustacean fishing

7c. Prohibit harvest of all coral species, live rock, all aquaria species and live fish trade species, and algae, sponges, and other invertebrates.

7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

3.4 COMMERCIAL BOTTOMFISH/PELAGIC FISHING

The draft MSA regulations for commercial bottomfish/pelagic fishing in the WPFMC Recommendation fail to fulfill the P&P of the NMSA and G&O of the proposed sanctuary designation. The G&O of sanctuary designation call for maintaining ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach (Goal 7). The development of a marine zoning system prescribing further limits on use to enhance ecosystem protection and ease of management and enforcement (Objective 3c) was deemed by NOAA as a fundamental management tool of an ecosystem-based management approach for the proposed sanctuary (NOAA 2004). The rationale for this finding and related elements of the G&O (Exhibit 4) are provided below.

The federally permitted NWHI commercial bottomfish fishery has been regulated under the current management regime since 1986. Limited entry was established for the larger, more distant Ho`omalu Zone in 1989 and for the Mau Zone in 1999 (WPFMC 1999). NOAA Fisheries Service issued a

Biological Opinion concluding the NWHI bottomfish fishery was not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify critical habitat (NOAA Fisheries 2002). Data show in over a decade of fairly stable fishing operations, the target species populations have remained high based on traditional management measures, including MSY (WPRFMC 2004a). Nevertheless, NOAA issued a notice that overfishing of the bottomfish multispecies stock complex is occurring around the Hawaiian archipelago (70 FR 34452, June 14 2005), requesting WPFMC take appropriate action to end this overfishing within one year.

Despite fairly stable fishing operations based on traditional management measures, the G&O of the proposed sanctuary designation calls for an ecosystem-based approach extending beyond a focus on target species to address impacts on non-target species, trophic interactions, and other ecosystem parameters. The WPFMC recommendation to establish a maximum number of bottomfishing permits at 10 (including 2 CDP permits) in the Mau zone and 7 permits in the Ho'omalu zone was based largely on economic considerations (Pooley 1996) and not on ecosystem considerations for the NWHI and could potentially increase the number of permits compared to current levels. In addition, the recommendation does not incorporate limits or controls on bottomfishing that could form the basis for developing an ecosystem-based management approach because it does not include representative habitats (especially deepwater slopes and banks and pelagic areas) for target species of bottomfish/pelagic fishery. The potential ecosystem impacts of bottomfishing, such as the role of metapopulation structure, biomass removal, and spatial movement between banks are also largely unknown. Under Objective 7e, bottomfishing may be allowed, but only as appropriate to maintain the natural character or biological integrity of any ecosystem of the region. Given the WPFMC's focus on economic considerations in establishing the maximum number of permits to be issued, the lack of any evidence offered by the WPFMC to support these levels as also consistent with protection of the ecosystem, and the G&O of erring on the side of protection in the face of uncertainty, the WPFMC recommendation fails to fulfill the G&O of the proposed sanctuary. (Objective 1b, 7e nd 7k).

The WPFMC recommendation regarding commercial bottomfish/pelagic fishing fails to fulfill the G&O of the proposed sanctuary for a second reason. While fishery managers and scientists alike are working to define all essential elements of an ecosystem-based management approach, fishery managers and scientists generally agree establishment of ecological reserves or area restrictions with similar management goals is a fundamental management tool for ecosystem-based management in the NWHI (NOAA 2004). Area restrictions should be designed to protect a range of ecosystem values (U.S. Coral Reef Task Force 1999; Crosby et al., 1997) including representative habitats of the target species to serve as buffers for management errors and as control sites to improve our understanding of ecosystem impacts of fishing, particularly important in the NWHI given the unknown impacts associated with bottomfishing. The WPFMC Recommendation to establish small, shallow-water no-take zones, however, would allow bottomfishing to occur in sensitive habitats which directly conflicts with the G&O of the proposed sanctuary (MP 6; Objectives 1b, 7e and 7k).

Finally, the WPFMC Recommendation does not require a vessel monitoring system (VMS) or some other mechanisms that could have addressed the need for data on individual fishing events in addition to this system's primary use for enforcement and surveillance and as a tracking system for access and use of sanctuary resources. VMS is an accepted tool for such purposes, and used by NOAA in this and other fishing regions and by foreign governments. For this reason as well, the WPFMC Recommendation fails to fulfill the G&O of the proposed sanctuary to provide for appropriate processes for enforcement and surveillance, as well as a tracking system for access and use that is compatible with partner agencies. (SM9, Objectives 2a and 2b).

EXHIBIT . KEY ELEMENTS OF GOALS AND OJECTIVES RELATED TO COMMERICAL BOTTOMFISH/PELAGIC FISHING

Goals and Objectives

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

1a. Develop and implement a comprehensive management plan that integrates best practices, available science, traditional knowledge, and innovative management techniques, and addresses both short-term and long-term resource protection needs.

1b. When there is uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

Goal 2: Provide for comprehensive and coordinated conservation and management recognizing and complementing existing jurisdictional boundaries and management regimes and involves stakeholder communities

2a. Develop and implement regional and global approaches, interagency agreements, and processes with partners to address key cross-jurisdictional activities such as education, resource and monitoring, enforcement and surveillance, and access.

2b. Created a permit, notification, and tracking system for access and use that is compatible and coordinated with partner agencies.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

3c. Develop a marine zoning system prescribing further limits on use to enhance ecosystem protection and ease of management and enforcement.

Goal 5: Support Native Hawaiian cultural, religious, and subsistence practices consistent with the long-term conservation and protection of the region.

Goal 6: Support, promote, and coordinate research and long-term monitoring that improves management decision-making and is consistent with the conservation and protection of the region.

Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas minimizing or preventing interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7e. Allow bottomfish fishing to continue except within sensitive habitats

7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

3.5 COMMERCIAL PELAGIC TROLLING

The draft MSA regulations for commercial pelagic trolling in the WPFMC Recommendation fail to fulfill the P&P of the NMSA and G&O of the proposed sanctuary designation. The G&O of sanctuary designation call for maintaining ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach (Goal 7). The development of a marine zoning system prescribing further limits on use to enhance ecosystem protection and ease of management and enforcement (Objective 3c) is deemed by NOAA as a minimum requirement of an ecosystem-based management approach for the proposed sanctuary. The rationale for this finding and related elements of the G&O (Exhibit 5) are provided below.

Traditional stock assessment measures indicate the status of pelagic fish stocks for most targeted species, such as *aku, mahi mahi, uku* and *ono* are healthy, although concerns have been expressed for yellowfin and bigeye tuna. Nevertheless, the relationship between these pelagic species and ecosystems of the NWHI is largely unknown, as is the impact from allowing fishing to continue as it has to date. Given the primary purpose of resource protection extending beyond a focus on target species to address impacts on non-target species, trophic interactions, and other ecosystem parameters (NMSA P&P 6); (SM and MP7), the G&O highlighting the need to limit and control fishing (Goal 7) and limit access only to those activities consistent with long-term ecosystem protection (MP 7; Goal 3, Objective 3a), and the G&O to err on the side of resource protection in the face of uncertainty, it is appropriate to place limits on commercial pelagic fishing and to prohibit such fishing in sensitive areas (MP 6; Objectives 1b, 7f and 7k).

The WPFMC Recommendation, however, fails to fulfill the G&O of the proposed sanctuary for two reasons. First, it fails to provide limits on commercial pelagic fishing outside of sensitive areas providing for an ecosystem-based management approach in light of the uncertainties with the health of pelagic stocks and their importance to the region's ecosystems (Objectives 1b, 7f and 7k). Second, while the WPFMC Recommendation would establish small, shallow-water no-take zones, it would still allow pelagic fishing in sensitive habitats (Objectives 7f and 7k).

EXHIBIT 5. KEY ELEMENTS OF GOALS AND OJECTIVES RELATED TO PELAGIC TROLLING

Goals and Objectives

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

1b. When there is uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

3c. Develop a marine zoning system prescribing further limits on use to enhance ecosystem protection and ease of management and enforcement.

Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas minimizing or preventing interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7f. Allow commercial pelagic fishing using handline, pole and line and trolling gear except within sensitive habitats

7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

3.6 SUBSISTENCE FISHING

The draft MSA regulations for subsistence fishing in the WPFMC Recommendation fail to fulfill the P&P of the NMSA and G&O of the proposed sanctuary designation. The G&O of sanctuary designation call for a prohibition of subsistence fishing except for Native Hawaiian subsistence use as appropriate to maintain the natural character or biological integrity of ecosystems of the region (Objective 7g). The rationale for this finding and related elements of the G&O (Exhibit 6) are provided below.

In 2004, NOAA adopted a definition of Native Hawaiian subsistence use developed by the NWHI Coral Reef Ecosystem Reserve Native Hawaiian Working Group for the purposes of sanctuary designation. This definition, provided to WPFMC at the initiation of the NMSA 304(a)(5) process (NOAA 2004), was developed to fulfill the G&O of sanctuary designation recognizing subsistence use together with cultural and religious practices as an inter-related set of uses that traditionally occurred together for the long-term conservation and protection of the region as envisioned by Objective 3b and Goal 5. In addition, and as noted above, there is a high degree of uncertainty associated with NWHI fisheries and the vulnerability of target species and ecosystems to natural and anthropogenic perturbations. Prohibiting subsistence fishing except for Native Hawaiian subsistence as developed by the Working Group is appropriate to maintain the natural character and biological integrity of the ecosystem of the region, particularly given uncertainties associated with allowing fishing in the NWHI and the need to err on the side of resource protection (Objectives 7g and 7k).

The draft MSA fishing regulations in the WPFMC Recommendation would allow the issuance of Community Development Permits (CDP) to Native Hawaiians for subsistence use and exempt CDP permittees from the moratorium on any coral reef ecosystem management unit species, crustacean management unit species, or precious coral management unit species. No definition of the actual meaning of "subsistence," however, has been provided that could be used to understand the difference between an application for a proposed CDP permit that would be used for commercial fishing from an application for a proposed CDP permit that would be for subsistence use. Indeed, the same eligibility criteria are used to evaluate applicants under both commercial and "subsistence" types of CDP permits, highlighting the absence of any means of distinguishing between these two categories of applicants. In addition, the WPFMC Recommendation for area restrictions would allow non-Native Hawaiian subsistence fishing to occur within the sanctuary boundary, outside the no-take zones. As such, subsistence fishing described in the WPFMC Recommendation is undefined and allows for subsistence fishing for non-Native Hawaiians. For both these reasons, the WPFMC Recommendation fails to fulfill the G&O of the proposed sanctuary, particularly given uncertainties associated with allowing fishing in the NWHI and the need to err on the side of resource protection (Objectives, 1b, 7g and 7k)

EXHIBIT 6. KEY ELEMENTS OF GOALS AND OJECTIVES STATEMENT RELATED TO SUBSISTENCE FISHING

Goals and Objectives

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

1b. When there is uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

3b. The management system shall continue to allow Native Hawaiian cultural, religious, and subsistence uses.

Goal 5: Support Native Hawaiian cultural, religious, and subsistence practices consistent with the long-

term conservation and protection of the region.
Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas minimizing or preventing interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.
Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7g. Prohibit subsistence use within the sanctuary except for Native Hawaiian subsistence use.
7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

3.7 SUMMARY – ALL FISHING ACTIVITIES

The draft MSA regulations for fishing activities in the WPFMC Recommendation fail to fulfill the P&P of the NMSA and G&O of the proposed sanctuary designation. The WPFMC Recommendation for all fishing activities were reviewed and received a negative total score of -4 using screening criteria based on the P&P of the NMSA and G&O of sanctuary designation. The key issues leading to this finding include following:

- Absence of marine zoning adequate to protect representative and critical habitat areas, and protected species from the fishing impacts.
- Provisions for future fishing activities not appropriate to maintain the natural character or biological integrity of the coral reef ecosystem in the region- precious corals, coral reef species, crustaceans.
- No criteria or process for opening prohibited fisheries.
- Absence of provisions for requiring ecosystem based science to inform management decision making.
- Provisions for an inappropriate level of bottomfish/pelagic fishing permitted and absence of adequate limitations on catch.
- Absence of defined Native Hawaiian subsistence fishing provisions.

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ATTACHMENT A

PROPOSED NORTHWESTERN HAWAIIAN ISLANDS NATIONAL MARINE SANCTUARY

Goals and Objectives Statement

Sanctuary Vision:

That the vast coral reefs, ecosystems, and resources of the Northwestern Hawaiian Islands (NWHI) -- unique in the world -- be healthy and diverse forever.

Sanctuary Mission:

Carry out coordinated and integrated management to achieve the primary purpose of strong and long-term protection of the marine ecosystems in their natural character, as well as the perpetuation of Native Hawaiian cultural practices and the conservation of heritage resources of the Northwestern Hawaiian Islands.

Sanctuary Management Principles:

The sanctuary shall be managed in a manner that:

1. *Is consistent with the Vision and Mission;*
2. *Recognizes that the resources of the Northwestern Hawaiian Islands are held as a public trust;*
3. *Incorporates and integrates best practices, available science, traditional knowledge, and innovative management techniques in order to have a comprehensive approach to both the ecological and social environment;*
4. *Honors the significance of the region for Native Hawaiians;*
5. *Enhances public awareness and appreciation of the unique character and marine environments of the NWHI;*
6. *Errs on the side of resource protection when there is uncertainty in available information on the impacts of an activity;*
7. *Authorizes only uses consistent with the primary purpose of resource protection and applicable law;*
8. *Coordinates with federal, state, and local governments, Native Hawaiians, and appropriate organizations;*
9. *Carries out appropriate and effective enforcement and surveillance and associated public outreach.*

Sanctuary Goals and Objectives:

Goal 1: Protect, preserve, maintain, and where appropriate restore the natural biological communities, including habitats, populations, native species, and ecological processes, of the Sanctuary as a public trust for current and future generations.

Objectives:

1a. Develop and implement a comprehensive management plan that integrates best practices, available science, traditional knowledge, and innovative management techniques, and addresses both short-term and long-term resource protection needs.

1b. When there is uncertainty in available information regarding the potential impacts of any activity, err on the side of resource protection.

1c. Develop and implement the necessary prohibitions, rules, regulations, and penalty schedules to achieve the primary purpose of resource protection and address the needs of the Sanctuary.

1d. Develop and implement a surveillance and enforcement program needed to ensure compliance with regulations.

1e. Cooperate with regional and global programs encouraging conservation of marine resources.

Goal 2: Provide for comprehensive and coordinated conservation and management that recognizes and complements existing jurisdictional boundaries and management regimes and involves stakeholder communities.

Objectives:

2a. Develop and implement regional and global approaches, interagency agreements, and processes with partners to address key cross-jurisdictional activities such as education, research and monitoring, enforcement and surveillance, and access.

2b. Create a permit, notification, and tracking system for access and use that is compatible and coordinated with partner agencies.

2c. Coordinate all activities to minimize impacts to ecosystems, avoid redundant or duplicative efforts, and to achieve efficient use of agency resources.

2d. Engage representative stakeholder communities and the public in seeking advice for effective management.

Goal 3: Manage, minimize, or prevent negative human impacts by allowing access only for those activities that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives:

3a. Allow access only for activities consistent with long-term ecosystem protection.

3b. The management system shall continue to allow Native Hawaiian cultural, religious, and subsistence uses.

3c. Develop a marine zoning system that prescribes further limits on use to enhance ecosystem protection and ease of management and enforcement.

3d. Develop a permitting and tracking system to identify, evaluate, and monitor activities, access, and uses in order to ensure consistency with long-term ecosystem protection.

3e. Develop other measures as may be necessary to ensure long-term ecosystem protection.

3f. Work with the appropriate domestic and international agencies to adopt a notification requirement for transiting non-military vessels and the designation of special maritime zones on nautical charts.

Goal 4: Enhance public awareness, understanding, and appreciation of the marine environment and cultural and maritime heritage resources.

Objectives:

4a. Develop public outreach and education programs with partners to raise public awareness of NWHI marine ecosystems and the need to protect them and to effectively communicate access and use restrictions.
4b. In order to minimize the use of and impact to the region, plan and establish programs that emphasize the concept of bringing the place to the people, rather than people to the place.
4c. Increase the awareness of marine conservation in the NWHI by emphasizing the global nature of threats to the ecosystems and the importance of the region to the state, the nation, and the world.
4d. Enhance the effectiveness of education programs and public outreach by incorporating Native Hawaiian culturally based themes and traditional approaches to learning, multiple perspectives, histories, and stories of the region.

Goal 5: Support Native Hawaiian cultural, religious, and subsistence practices that are consistent with the long-term conservation and protection of the region.

Objectives:

5a. Build capacity within the Sanctuary program to develop a working relationship with Native Hawaiians to facilitate their participation in the management of the Sanctuary.
5b. Develop a plan for Native Hawaiian access and use in the NWHI collaboratively with Native Hawaiians and regional partners.
5c. Increase understanding of Native Hawaiian histories and cultural practices in the NWHI through research and oral traditions.
5d. Integrate Native Hawaiian traditional knowledge, values, and perspectives into management and education programs.

Goal 6: Support, promote, and coordinate research and long-term monitoring that improves management decision-making and is consistent with the conservation and protection of the region.

Objectives:

6a. Identify, assess, prioritize, and authorize ecological, historic, cultural, and socioeconomic research and monitoring necessary for effective management of the region.
6b. Coordinate with regional and national agencies to make vessels and other resources available for conservation and research activities.
6c. Compile existing research and avoid duplication by collaborating and coordinating with jurisdictional partner agencies and universities.
6d. Develop the ability to quickly assess and respond to unexpected, rapid ecological changes that have occurred as a result of storm events, dramatic climate and temperature shifts, and other occurrences.
6e. Establish criteria for cultural research activities through consultation with the Native Hawaiians.
6f. Work with partners and researchers to make NWHI research available and accessible to the public in a timely manner.

Goal 7: Maintain ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach. Maximize ecosystem protection while minimizing adverse socioeconomic impacts. Limit fishing activities to areas that minimize or prevent interactions with corals, seabirds, endangered Hawaiian monk seals, and other protected wildlife, or that do not threaten the natural character or biological integrity of any ecosystem of the region.

Objectives: As appropriate to maintain the natural character or biological integrity of any ecosystem of the region:

7a. Prohibit non-subsistence crustacean fishing.
7b. Prohibit commercial precious coral fishing.
7c. Prohibit harvest of all coral species, live rock, all aquaria species and live fish trade species, and algae, sponges, and other invertebrates.
7d. Allow recreational fishing for pelagic species except within sensitive habitats.
7e. Allow bottomfish fishing to continue except within sensitive habitats.
7f. Allow commercial pelagic fishing using handline, pole and line and trolling gear except within sensitive habitats.
7g. Prohibit subsistence use within the sanctuary except for Native Hawaiian subsistence use.
7h. Allow sustenance fishing for pelagic and bottomfish species using pole and line, trolling and handline methods with the Sanctuary except within sensitive habitats.
7i. Allow spearfishing without the use of SCUBA for pelagic species except within sensitive habitats.
7j. All fishing not specifically allowed shall be prohibited.
7k. When there is uncertainty in available information regarding the potential impacts of any fishing activity, err on the side of resource protection.

Western Pacific Regional Fishery Management Council

November 11, 2005

Vice Admiral Conrad C. Lautenbacher
Under Secretary of Commerce for Oceans and Atmosphere
United States Department of Commerce
14th Street and Constitution Avenue, N.W.
Washington D.C. 20230

Dear Admiral Lautenbacher:

We are writing in response to findings issued by the National Oceanic and Atmospheric Administration (NOAA) on October 24, 2005, concerning the Western Pacific Regional Fishery Management Council's (Council) proposed fishery management regime for the proposed Northwestern Hawaiian Islands (NWHI) National Marine Sanctuary. While we take no pleasure in sending a letter of this nature, given the history of these proceedings, the Council believes that it is obligated to highlight its scientific and legal concerns associated with your recent rejection of the Council's April 14, 2005, proposal for fishery management regulations. It is our hope that this correspondence will trigger productive discussions that will benefit both proponents for the proposed NHWI sanctuary and proponents for responsible use of Hawaii's marine resources.

Overview of the Issue

On October 24, 2005, NOAA issued findings concerning the Council's April 14, 2005, draft fishing regulations for the proposed NWHI sanctuary. The Council prepared these regulations and their associated background materials pursuant to Section 304(a)(5) of the National Marine Sanctuary Act (NMSA), and in compliance with the Magnuson-Stevens Fishery Conservation and Management Act (MSA) after months of discussion and work with NOAA staff and managers. A summary of the Council's proposal and NOAA's response is attached as Appendix A.

Your October 24, 2005 letter, and the attached document entitled *Findings on the Recommendation of the Western Pacific Fishery Management Council Regarding the Management of Fisheries within the Proposed Northwestern Hawaiian Islands National Marine Sanctuary* ("Findings") states that NOAA has disapproved, in its entirety, the Council's April 14, 2005 recommendations regarding the management of fisheries within the proposed sanctuary. Needless to say, we were taken aback by the Agency's complete disregard of the Council's recommendations, and the Agency's apparent results-orientated approach to this process.

Based upon the Council's review of your letter and the attached Findings document, it is apparent that in its haste to reach a result, NOAA has (1) misinterpreted our recommendations; (2) ignored basic procedural and substantive requirements, such as compliance with the National Environmental Policy Act (NEPA), the Data Quality Act, the Administrative Procedures Act

(APA), the MSA, and the NMSA; and (3) failed to articulate a rational basis to reject the Council's recommendations. We address each of these issues below. It is the Council's view that the resulting Findings document produced by the Agency is not supported by credible scientific information, and is replete with conclusory and otherwise unsupported statements regarding the potential effects of the Council's recommendations regarding marine resources within the proposed marine sanctuary.

Given what we believe to be serious flaws present in the Agency's decision, the Council requests that NOAA withdraw its October, 2005, Findings document. In doing so, the Council recommends that NOAA establish a process whereby the Council and NOAA may work together to develop a scientifically- and legally-supportable fishery management program for the proposed sanctuary as contemplated by the MSA and NMSA. To facilitate the Council's participation in this process, the Council formally requests a complete copy of the Agency's administrative record supporting its October, 2005, Findings, including all internal and external Agency communications regarding this matter.

Summary of Technical and Scientific Issues Concerning the Findings

A fundamental problem with the Findings document is that it entirely ignores the Council's attempt to comprehensively address all fishery management programs within the proposed sanctuary. Current and proposed NWHI fishery management programs developed by the Council regulate fishing activities conducted by all fishing sectors, not just the commercial fishing sector. In its April 14, 2005, proposal, the Council recommended a moratorium on all fisheries (commercial, recreational, subsistence and sustenance fishing) for coral reef associated species, crustacean and precious corals until one or more science-based fishery ecosystem management plans for the NWHI could be developed by the Council, in consultation with the National Marine Sanctuary Program (as well as the State of Hawaii, the U.S. Fish and Wildlife and the U.S. Coast Guard in their roles as Council members) to address impacts on fish stocks and ecological components of the total ecosystem. Similarly, the Council recommended that pelagic fisheries (i.e. commercial, recreational, subsistence and sustenance) be allowed only by trolling and handline hook and line gear subject to federal permitting and reporting requirements.

The Findings document ignores the Council's proposed moratoria, instead focusing solely on the Council's proposed regulations for commercial fishing. The Findings document states only that commercial fishing recommendations made by the Council do not meet the goals and objectives of the proposed sanctuary, and thereafter fails to discuss all other elements of the Council's proposal. See Findings at 7 (Commercial Precious Coral Fishing); 8 (Commercial Coral Reef Species Fishing); 10 (Commercial Crustacean Fishing); 11 (Commercial Bottomfish/Pelagic Fishing) and 13 (Commercial Pelagic Trolling). Given the complete lack of specific findings on the matter, it is unclear whether the Council's proposed moratorium on recreational, subsistence and sustenance fishing for coral reef associated species, crustaceans and precious corals, and the proposed federal permitting requirements for non-commercial pelagic trolling, fulfills the goals and objectives of the proposed sanctuary and the purpose and policies of the NMSA.[1]

[1] The Council finds it rather difficult to believe that the proposed moratoria fail to fulfill the purpose and policy of the NMSA. Further, the Council believes it inappropriate to simply omit consideration of these important components of the Council's proposed program without providing some rational explanation for doing so.

Aside from the overall lack of consideration of significant portions of the Council's April 14, 2005, recommendations, a number of significant errors, misstatements and omissions exist in the Findings document:

1. Page 7 of the Findings document states that "despite this information and data, recent recommendations from PAM call for changes in management measures to avert serious problems with the black coral fishery in the main Hawaiian Islands due to recruitment failures from overfishing and invasive species (WPFMC 2005)." This statement is patently false, and misleading. The citation provided by NOAA references findings made at a Council meeting that never in fact occurred. Further, the Council has never stated that overfishing is the cause of decline for black coral in the main Hawaiian Islands, or that such species have suffered a recruitment failure. This serious mischaracterization of available information speaks to the reliability of findings made by NOAA on this matter.

2. Page 12 of the Findings document states that NOAA rejected the Council's recommendations for bottomfish because such recommendations do not require the use of vessel monitoring systems (VMS) to address the need for data on individual fishing events. The Council is unable to identify a specific goal or objective for the proposed sanctuary that supports this statement, and it strongly suggests that NOAA has selectively interpreted its goals and objectives to support a pre-determined outcome of curtail all fishing activities in the proposed sanctuary.

3. Page 15 of the Findings document states that NOAA believes that prohibiting subsistence fishing except for Native Hawaiian subsistence is appropriate to maintain the natural character of ecosystem, particularly given uncertainties with allowing fishing in NWHI, and the need to err on side of resource protection. In making this statement, however, NOAA fails to provide any evidence suggesting that permitting recreational or subsistence fishing activities as proposed will be inconsistent with ecosystem protection. Not only is NOAA's finding arbitrary and unsupported by any evidence, it suggests arbitrary discrimination against diverse user groups on the basis of conjecture and surmise.

4. Nowhere does the Findings document state whether and how the Council's recommendations are inconsistent with the purposes and policies of the NMSA. The Council requests that NOAA clarify its position on the consistency of its recommendations with the NMSA.

5. The Findings document also fails to define ecosystem or biological "integrity". Because this phrase has become an essential part of this discussion, the Council requests that NOAA include a definition of these terms as well as scientifically based quantitative methodologies for assessing the impacts of human activities on ecosystem or biological integrity in its Draft Environmental Statement and any other analytical documents on the proposed NWHI sanctuary.

In summary, the Findings document is replete with unsupported conjecture, misstatements, and mischaracterizations of Council statements. More importantly, the Findings document summarily rejects a carefully-crafted fishery management proposal that incorporates a detailed framework for ecosystem-based management, harvest guidelines, closed areas, limited entry programs, and vessel size limits without any credible analysis. The conclusions contained in the Findings document leave the Council with the impression that the standardless process proposed in your October 24, 2005, letter to develop fishery management programs will have little, if any, influence, on the pre-determined decision to curtail or eliminate all fishing in the proposed sanctuary.

Summary of Procedural and Substantive Issues Concerning the Findings

A number of significant procedural and substantive deficiencies exist regarding NOAA's October 24, 2005, Findings document that bear on the Agency's consideration of the Council's proposal. In general, the Council believes the process used by the Agency to evaluate Council proposals and to develop sanctuary goals and objectives has been biased, and not conducted in a manner that would instill confidence in Agency decisions emanating from it.[2] Beyond these issues, the Council remains deeply concerned with the legal sufficiency of NOAA's October, 2005, Findings document due to the Agency's failure to comply with NEPA, the Data Quality Act, the APA, the MSA, and the NMSA.

National Environmental Policy Act Compliance

The Council is unclear whether NOAA's development of proposed sanctuary goals and objectives used to evaluate the Council's proposed fishing management regulations adequately comply with the requirements of NEPA. As reviewing courts have indicated, adoption and implementation of programmatic management plans require federal agencies to comply with NEPA. In the present situation, NOAA relies upon proposed sanctuary goals and objectives developed in furtherance of NWHI sanctuary designation to reject the Council's proposed fishery management programs under section 304(a)(5) of the NMSA. However, to date, NOAA has not completed any meaningful NEPA evaluation of existing goals and objectives, but instead intends to do so through future NEPA processes concerning sanctuary designation.

The Council believes it premature to reject its proposed fishery management programs under NMSA Section 304(a)(5) until such time that NOAA has completed an adequate NEPA review of the proposed goals and objectives for the NWHI sanctuary. We request that NOAA clarify how its development of its proposed NWHI sanctuary goals and objectives, and NOAA's subsequent rejection of the Council's April 14, 2005, draft regulations, complies with the requirements of NEPA.

Data Quality Act Compliance

Section 515 of the Treasury and General Government Appropriations Act (the Data Quality Act or Information Quality Act) requires that federal agencies issue information quality guidelines that ensure and maximize the quality, objectivity, utility and integrity of information disseminated by the agency; establish administrative mechanisms that allow affected persons to seek and obtain correction of information that does not comply with agency-specific quality

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[2] During the formulation of proposed sanctuary goals and objectives, the Council repeatedly attempted to ensure that meetings and advisory processes were conducted in a fair and open manner to facilitate the use of the best available scientific and commercial data. However, despite its repeated attempts to facilitate such meetings, the Council was repeatedly met with resistance, and in some cases, open hostility. The Council intends to submit a more thorough record of these proceedings for your reference.

guidelines or the "umbrella" information quality guidelines; and make annual reports to OMB regarding the number and disposition of requests for correction of information. If an agency is responsible for disseminating influential scientific, financial, or statistical information, agency guidelines shall include a high degree of transparency about data and methods to facilitate the reproducibility of such information. See 67 Fed. Reg. 8452 (February 22, 2002)(OMB Data Quality Act Guidelines).

According to both OMB and NOAA Data Quality Act policies, transparency of agency decisions is an important component of Data Quality Act compliance. In the present case, the rationale behind NOAA's Findings is far from transparent, and this lack of transparency calls into question the underlying data upon which the Findings are based. OMB policies likewise indicate support for the use of independent peer review of scientific information. However, the Findings document does not appear to have undergone such review, and information contained in it does not appear to comply with the requirements of the Act.

We request that NOAA clarify the processes it has used to comply with the Data Quality Act in preparing the October, 2005 Findings document, including the basis for any certifications made under the Act. In accordance with Department of Commerce policies, we request that the Agency make timely and public corrections of information contained in the October, 2005 Findings and associated documents in the event such information does not comply with applicable information quality guidelines.

Administrative Procedures Act Compliance

As with all federal government actions, NOAA must insure that its decisions are not "arbitrary or capricious" under the APA. See 5 U.S.C. § 706(2)(A). Simply stated, the APA requires agencies to articulate a rational basis for their decisions based upon the record before the agency.

The Council is concerned that conclusions contained in NOAA's Findings document concerning the Council's proposed fishery management regime are not supported by any scientific information, or the record before the agency. The Council's April 14, 2005, recommendations and associated background material provided ample evidence to support adoption of the Council's draft regulations. NOAA however, has rejected those recommendations on the basis of speculation, surmise, and conclusory statements that are not supported by any factual or scientific information. Further, information used by the Agency in its Findings document is inaccurate, and as explained above, the Findings document misinterprets Council positions and findings regarding the status of fishery resources in the NWHI.

Through this letter, the Council requests a complete copy of the Agency's administrative record supporting its October 24, 2005 Findings document. The Council intends to review the complete record before the Agency in this matter to verify the integrity of scientific and other information used by the Agency to arrive at its decision. Upon completing its review, the Council will provide NOAA with a detailed summary of is review, including any additional scientific, economic, or other information omitted from the Agency's consideration.

Magnuson-Stevens Act and National Marine Sanctuaries Act Consistency and Compliance

As discussed in the October, 2005, Findings document, section 304(a)(5) of the NMSA the Council is entitled to prepare draft fishing regulations that fulfill the purposes and policies of the NMSA, and the goals and objectives of the proposed sanctuary. Proposed regulations shall be accepted and issued as proposed regulations unless NOAA finds they do not fulfill the purposes and policies of the NMSA, or the goals and objectives of the proposed sanctuary. In preparing draft fishing management programs under Section 304(a)(5) of the NMSA, the Council must comply with the requirements of the MSA.

First and foremost, the Council believes that the MSA provides an appropriate and well-defined process for developing fishery management programs while the NMSA lacks standards, guidelines, and clear protocols for developing such programs. As a result, the Council believes it is appropriate for the NOAA to defer to MSA processes for the development of fishing regulations within designated sanctuaries.

Second, in the present case, the Council believes that proposed sanctuary goals and objectives, and NOAA's interpretation of NMSA purposes and policies, are not supported by the record, and are inconsistent with the statute itself. Both the NMSA and MSA explicitly contemplate that commercial, recreational, and subsistence fisheries constitute permissible uses of marine sanctuaries. NOAA's interpretation of the NMSA however, and its development of narrowly focused sanctuary goals and objectives, contradicts such uses, and reflects an intention by the Agency to frustrate congressional intent by finding that any responsible fishery management program is, by definition, inconsistent with the NMSA. Clearly, this is not what Congress intended in passing these laws.

Finally, the Council believes that when direct conflicts exist between implementation of the MSA and the NMSA, such as in this case, the Agency should develop clear protocols and procedures for resolving such conflicts with the appropriate fishery management council. To date, the Agency has failed to engage in an open and honest discussion about the application of these statutes, and has instead deferred to internal Agency decision makers who are not accountable to the public for their decisions.

We request that NOAA provide the Council with any policies or protocols developed to date that discuss how NOAA intends to evaluate fishery management proposals under both the NMSA and MSA. To the extent that NOAA has not yet developed such policies or protocols, we recommend that NOAA convene a workgroup consisting of Council Chairs, appropriate congressional representatives, and NOAA managers to discuss the formulation of such policies and protocols.

Summary and Conclusions

For the reasons outlined above, the Council respectively requests that NOAA withdraw its October 24, 2005, Findings, concerning the Council's April 14, 2005, proposed fishery management regulations for the proposed NWHI marine sanctuary, and that NOAA engage in an open and collaborative process with the Council to develop appropriate fishery management programs for the proposed NWHI sanctuary.

In furtherance of these requests, the Council requests a complete copy of the Agency's administrative record supporting its October, 2005, Findings. We also request the opportunity to meet with you and your staff to discuss the scientific and legal basis for your findings in more detail.

Thank you for your consideration of these comments. Please contact Kitty Simonds, Executive Director, Western Pacific Regional Fishery Management Council, if you have any questions regarding this request.

Sincerely,

Frank McCoy, Chair
Western Pacific Regional Fishery Management Council

Appendix A. Summary of Council Proposals and NOAA Findings

1. Overall Council Recommendations

- Moratorium on coral reef, precious coral and crustacean fisheries until a science-based Fishery Ecosystem Plan containing ecosystem approaches to management is developed by the Council, in consultation with NOAA Fisheries and the NMSP;
- CDP permits with exemption for Native Hawaiians from moratoria
- Maximum number of bottomfish permits
- Permit and reporting for pelagic trolling

NOAA Findings: Does not fulfill the goals and objective of the proposed sanctuary and the purpose and policies of the NMSA.

Rationale: Council failed to identify criteria that would be used to end, or the nature of the specific process for ending the moratoria. This approach fails to provide limits or controls necessary to maintain ecosystem integrity

2. Precious Coral Fishing

- Moratorium on precious coral fishing until a science-based Fishery Ecosystem Plan containing ecosystem approaches to management is developed by the Council, in consultation with NOAA Fisheries and the NMSP.
- Under the Council's recommendation to the NMSP, all precious coral harvest would be prohibited until the Council in consultation with NOAA Fisheries and the NMSP could develop a science based FEP evaluating the efficacy of the current 1,000 kg harvest limit on maintaining precious coral stocks and if necessary, implement further limits and controls to maintain ecosystem integrity.

NOAA Findings: Does not fulfill the goals and objective of the proposed sanctuary and the purpose and policies of the NMSA.

Rationale: The significance of the precious coral beds to maintaining the natural character and biological integrity of the region's ecosystem demonstrates it is appropriate to prohibit commercial precious coral fishing, consistent with Objectives 7b and 7c.

Prohibition is further supported by recent concerns over the black coral fishery in the main Hawaiian Islands (cites overfishing by 5 fishermen).

Fails to provide limits or controls necessary to maintain ecosystem integrity, particularly given the uncertainty of impacts associated with such activity.

3. Coral Reef Species Fishing

- Moratorium on coral reef fishing until a science-based Fishery Ecosystem Plan containing ecosystem approaches to management is developed by the Council, in consultation with NOAA Fisheries and the NMSP.

NOAA Findings: Does not fulfill the goals and objective of the proposed sanctuary and the purpose and policies of the NMSA.

Rationale: The available scientific record readily demonstrates the coral reef ecosystems are significant to maintaining natural character and biological integrity of the region's ecosystems; their significance readily supports the conclusion it is appropriate to prohibit coral reef fishing consistent with objective 7c.

The available evidence supports the conclusion allowing harvesting commercial harvesting of coral reef species would likely result in a significant adverse impact to the proposed sanctuary's ecosystems and should be prohibited to maintain natural character and biological integrity of the region's ecosystems

Need to limit and control fishing and limit access only for activities consistent with long-term ecosystem protection.

4. Crustacean Fishing

- Moratorium on crustacean fisheries until a science-based Fishery Ecosystem Plan containing ecosystem approaches to management is developed by the Council, in consultation with NOAA Fisheries and the NMSP.

NOAA Findings: Does not fulfill the goals and objective of the proposed sanctuary and the purpose and policies of the NMSA.

Rationale: Overfishing, species shift, lack of appreciable rebuilding, unknowns regarding vulnerability of the species to natural and anthropogenic perturbations, ecological impact of slipper lobsters replacing spiny lobsters, likely importance of lobsters in monk seal diet

5. Bottomfish/Pelagic Fishing

NOAA Findings: Does not fulfill the goals and objective of the proposed sanctuary and the purpose and policies of the NMSA.

Rationale: Marine Zoning was deemed by NOAA as a fundamental management tool of an ecosystem-based management approach. Limited entry is not based on ecosystem considerations and could raise the number of permits compared to current levels.

Council recommendation does not incorporate limits or controls on bottomfishing that could for the basis for developing an ecosystem-based management approach because it does not include representative habitats (especially deep-water slopes and pelagic areas) for target species.

The ecological impacts of bottomfishing, such as the role of metapopulation structure, biomass removal, and spatial movement between banks are also largely unknown.

Lack of evidence to demonstrate how limiting fishery to 17 permits is consistent with ecosystem protection or errs on the side of protection in the face of uncertainty

Council no-take MPAs too shallow and would allow fishery to operate in "sensitive areas." Council does not include mandatory VMS

6. Pelagic Trolling

NOAA Findings: Does not fulfill the goals and objective of the proposed sanctuary and the purpose and policies of the NMSA.

Rationale: Goal and objective of sanctuary designation calls for maintaining ecosystem integrity by limiting and controlling fishing activities using an ecosystem-based management approach.

Council fails to provide limits on commercial pelagic fishing outside of sensitive areas providing for an ecosystem-based management approach in light of the uncertainties with the health of pelagic stocks and their importance to the region's ecosystems.

Council would still allow pelagic fishing in sensitive habitats.

7. **Subsistence Fishing**

NOAA Findings: Does not fulfill the goals and objective of the proposed sanctuary and the purpose and policies of the NMSA.

Rationale: High degree of uncertainty associated with NWHI fisheries and the vulnerability of target species and ecosystems to natural and anthropogenic perturbations.

No definition of the actual meaning of "subsistence," has been provided that could be used to understand the difference between an application for a proposed CDP permit that would be used for commercial fishing from an application for a proposed CDP permit that would be used for subsistence use.

Council would allow non-Native Hawaiian subsistence fishing to occur within the sanctuary boundary, outside of no-take zones.

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary of Commerce
for Oceans and Atmosphere
Washington, D.C. 20230

JAN 18 2006

Mr. Frank McCoy
Chair, Western Pacific
Fishery Management Council
1164 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. McCoy:

Thank you for your letter regarding the National Oceanic and Atmospheric Administration's (NOAA) findings concerning the Western Pacific Fishery Management Council (Council) recommendations for regulation of fishing in the proposed Northwestern Hawaiian Islands (NWHI) sanctuary. I assure you that we carefully considered the Council's recommendations and your comments on our findings. However, NOAA appropriately concluded the recommendations did not fulfill the goals and objectives of the proposed sanctuary and the purposes and policies of the National Marine Sanctuaries Act (NMSA).

As noted in my October 24, 2005, letter, NOAA is developing alternatives in the Draft Environmental Impact Statement (DEIS) for the proposed sanctuary that would enable the Council to continue to recommend management measures for the commercial bottomfish/ pelagic fisheries through regulations under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), consistent with the goals and objectives of the proposed sanctuary. While the preferred alternative has not been selected, the range of alternatives under consideration includes a regulatory regime allowing commercial bottomfishing and non-longline pelagic fishing to continue either: (1) indefinitely, (2) until 2025, or (3) for 5 years with a ban on fishing thereafter. For (1) and (2), interim catch levels and permit limits for the sanctuary consistent with the Executive Orders that created the NWHI Coral Reef Ecosystem Reserve (Executive Orders 13178 and 13196) would be established pending the development and implementation of an ecosystem management plan. For the 5-year phaseout alternative, the number of permits would be limited to those permits active at the time of designation.

In November 2005, NOAA initiated discussions with the Council regarding the possibility of establishing these catch levels and permit limits (collectively "limits") under the MSA consistent with these possible alternatives, and the timing of action to implement such limits given the anticipated designation of the proposed sanctuary by early 2007.

NOAA's first step was to determine if there is a legal basis to propose issuance of these limits under the MSA. While a factual record supporting such limits has not been fully developed, NOAA believes there is a credible basis to move forward with proposing such limits through amendment of the Bottomfish and Pelagics Fishery Management Plans (FMPs), and adoption of corresponding regulations. Of course, further record development and administrative process would be needed under the MSA and the Administrative Procedure Act before any FMP amendment or corresponding regulations could receive final approval from the Secretary of Commerce. Nevertheless, NOAA stands ready to work with the Council in pursuit of these limits under the MSA.

In June 2006, NOAA plans to publish the DEIS and its proposed sanctuary regulations under the NMSA. If, by May 1, 2006, the Council transmits for Secretarial review an amendment to the Bottomfish and Pelagics FMPs and corresponding proposed regulations implementing these limits, and if one of the alternatives outlined above is selected as a preferred alternative, NOAA would review those MSA regulations as a potential mechanism for implementation of the limits under the preferred alternative, rather than implementing the alternative via the NMSA. To meet that timeline, the Council would need to adopt a proposed FMP amendment and corresponding regulations no later than its March 2006 meeting, with final adoption of the FMP amendment and corresponding regulations by April 14, 2006.

In pursuing an FMP amendment and corresponding regulations, the Council must be guided by MSA requirements. The Council may ultimately choose to propose MSA regulations with limits different from those included in the alternatives outlined above, or take no action. I wish to reiterate that the sanctuary designation process is ongoing, and a preferred alternative has not yet been selected. Given that fact, we must recognize the possibility that limits proposed under a preferred alternative in the sanctuary designation process may differ from those proposed by the Council. Moreover, the final outcome of the sanctuary designation process may lead NOAA to issue final regulations that differ from the proposed sanctuary regulations. Notwithstanding these potential outcomes, NOAA is offering this opportunity so the Council may give consideration to undertaking the actions outlined above, to ensure the Council has every opportunity to continue managing the bottomfish and pelagic fisheries consistent with the sanctuary designation.

I appreciate the Council continuing to work with NOAA as we proceed towards designation of the NWHI Sanctuary. Mr. Bill Robinson, Regional Administrator, will contact the Council in the next week to determine if you are interested in pursuing this approach. I look forward to your response.

Sincerely,

Conrad Lautenbacher

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