



COMBINED FISHERY MANAGEMENT PLAN, ENVIRONMENTAL ASSESSMENT AND
REGULATORY IMPACT REVIEW FOR THE
BOTTOMFISH AND SEAMOUNT GROUNDFISH FISHERIES OF THE WESTERN PACIFIC REGION

FINAL
MARCH 1986

Western Pacific Regional Fishery Management Council
1164 Bishop Street, Suite 1405
Honolulu, Hawaii 96813

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2.0 PREFACE

2.1 Title and Location of Proposed Action

This document presents the combined Fishery Management Plan (FMP), Environmental Assessment (EA), and Regulatory Impact Review (RIR) for the Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region. The plan was prepared by the Western Pacific Regional Fishery Management Council (WPRFMC) principally to establish a framework for managing the bottomfish fisheries within the U.S. Fishery Conservation Zone (FCZ) around Hawaii, American Samoa, and Guam and the seamount groundfish fisheries in the FCZ around the Hancock Seamounts northwest of the Hawaiian Islands. The inner boundary of the FCZ is a line coterminous with the seaward boundary of each of the coastal States and Territories, and the outer boundary of the zone 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. Midway Island is a possession of the U.S., but for the purpose of the FMP, Midway is treated as if it is part of the State of Hawaii. Although the FCZ includes waters off the Northern Mariana Islands and miscellaneous U.S. island possessions, the plan proposes no management system for the FCZ in those areas because of the relatively undeveloped status of the deepsea bottomfish fishery.

The plan covers a diverse group of species which are taken by a variety of gear, principally hook-and-line in the bottomfish fishery and trawl in the seamount groundfish fishery. The plan addresses fish stocks that are in all stages of exploitation. It recognizes that harvesting and marketing practices in the bottomfish fishery cause some species to be fished more intensively than others.

2.2 Proposed Actions

2.2.1 Framework for Future Actions

The plan proposes a "framework" for managing the bottomfish fishery in the FCZ around Hawaii, American Samoa and Guam. This framework is largely an administrative procedure which describes the processes by which the fishery will be managed and which establishes the limits and controls within which regulatory adjustments may be made. A set of heavily-fished species would be routinely monitored and a set of indicators would provide the basis for further investigation. Investigation could result in recommendations to make adjustments in the manage-

ment system in response to new information. The types of adjustments that could occur include the following:

- Catch Limits (individual or total harvest)
- Size Limits
- Area/Season Closures
- Fishing Effort Limitation
- Fishing Gear Restrictions
- Access Limitation
- Permit and/or Catch Reporting Requirements for the FCZ
- Rule-Related Notice System

These are options for future consideration but the acceptability and mechanics of each measure would be subject to further review when a specific action is proposed.

2.2.2 Immediate Actions

2.2.2.1 Prohibit Bottom Trawl and Bottom-Set Nets

The use of bottom trawl and bottom-set net gear to harvest bottomfish would be prohibited in the FCZ around Hawaii, American Samoa and Guam. Although there is no known use of these gear-types at present in the fishery, there are several reasons for establishing a prohibition:

-- Less Selective and Lower Quality Catch Than Hook-and-Line Fishery

Nets are less selective in terms of species caught than is hook-and-line gear. Furthermore, netted bottomfish are susceptible to damage which reduces the catch quality compared to the higher quality of the hook-and-line catch.

-- Overcapitalization

There is sufficient harvesting capacity in the hook-and-line fleet to harvest the entire maximum sustainable yield in the bottomfish fishery. The entry of bottom trawlers or gill-netters would only add unnecessary harvesting capacity and increase the problem of overcapitalization, as well as create gear conflicts.

-- Habitat Degradation

Lost nets present a potential for ghost fishing and subsequent habitat degradation.

The effect of a bottom trawl fishery on the quality of bottom habitat off Australia has been examined. The trawling converted an initially irregular bottom to a smoother bottom. An alteration in species structure occurred as the character of the habitat was modified (K. Sainsbury, draft ms. presented at Workshop on the Biology of Tropical Groupers and Snappers, May 20-22, 1985, Honolulu).

It is the hypothesis of some fisheries scientists that the bottomfish populations in the western Pacific islands are limited by availability of high relief habitat. There is so little habitat off the Pacific islands which meets the requirements of deepwater bottomfish that degradation or alteration of even a small amount could be extremely detrimental to the fishery.

-- Net Gear/Protected Species Interactions

The use of bottom gill nets and bottom trawls by domestic fishermen has been very limited to date, and is not presently in use but if these fishing methods should ever develop in Hawaii, incidental mortality of monk seals or sea turtles could occur as the result of the animals becoming entangled in lost netting or net fragments.

2.2.2.2 Adopt Existing State/Territory Measures
In Adjacent FCZ

The following State/Territory laws/rules would be adopted in the adjacent FCZ:

Jurisdiction	Law/Rule
Territory of Guam	Prohibition on use and possession of explosives, poisons or intoxicating substances (Article 1, Section 12303, 12305).
State of Hawaii	Prohibition on the use and possession of explosives, poisons or intoxicating substances (HRS Section 188-23).

In addition, the use of explosives and poisons or intoxicating substances to harvest bottomfish in the FCZ adjacent to American Samoa would be prohibited.

Extending the prohibitions on the use of explosives and poisons to the harvesting of bottomfish in the FCZ would be generally beneficial in protecting stocks and habitat from destructive fishing techniques.

2.2.2.3 Moratorium on the Harvest of Seamount Groundfish

A moratorium on commercial fishing (by foreign and domestic fishermen) is recommended for an initial period of 6 years to restore depleted armorhead stocks at the Hancock Seamounts. Experimental fishing could be allowed under permit for those who may want to try non-trawl gear under controlled conditions. This closure should be accompanied by scientific investigations to assess the recruitment and recovery process. The 6-year period is proposed so that several cycles of recruitment can be investigated. These investigations would provide the basis for re-establishing an optimum yield (OY) for the seamount groundfish fishery from the initial OY determination of zero (0). The National Marine Fisheries Service is asked to report to the Council throughout the 6-year experimental closure period on the recovery of the Hancock Seamounts groundfish stocks and on the progress, if any, in obtaining international agreement on a management plan for groundfish species throughout their range in the Emperor Seamount chain.

2.2.2.4 Federal Permit Requirement for Bottomfishing in the FCZ of the Northwestern Hawaiian Islands

The Federal permit requirement for the FCZ of the NWHI would provide accurate monitoring of increases/decreases in fishing effort and in entry/exit patterns of the bottomfish fleet. A listing of permitted bottomfish vessels would allow more effective surveillance by the Coast Guard aircraft. It would also provide the U.S. Fish and Wildlife Service and the NMFS a point of contact with the fishermen and provide an opportunity for education on the sensitivity of the NWHI's unique wildlife and the need for their protection. As a part of the permit application an informational document which includes a protected species/fishing operation interaction or "take" form and a statement to be signed stating that the applicant has read and understands the applicable laws, regulations and penalties regarding the protected species of the area has been added. The

information requested on the permit application will be considered confidential and provide essential information for evaluating the various management options under the framework process.

2.2.2.5 Experimental Fishing Permit

Experimental fishing permits for domestic fishermen may be issued by the Regional Director of the NMFS. These controlled permits will be used to improve the data base by allowing fishing activities which might otherwise be prohibited by regulations promulgated through the framework process.

2.3 Summary of Management Costs

The implementation of the Bottomfish and Seamount Groundfish management plan will involve costs incurred by the State of Hawaii, the National Marine Fisheries Service, the U.S. Coast Guard, and the Western Pacific Regional Fishery Management Council (Appendix F).

The costs of management under a no FMP, a framework FMP, and a conventional FMP have been estimated. The U.S. Coast Guard surveillance and enforcement costs are roughly \$1.83 million. This figure represents the total costs for a multi-purpose multi-fishery effort. A breakdown by fishery or purpose is very difficult to estimate. Additional costs under any management scheme is not foreseen to increase significantly.

Under a no FMP alternative, the projected costs, not including the Coast Guard costs, total \$308,000 annually and is equivalent to approximately 8% of the value of the 1984 domestic commercial bottomfish fishery of the western Pacific FCZ. Under a no FMP alternative, State/Territory jurisdiction would prevail and no additional enforcement or administrative costs would be incurred. The seamount groundfish stocks would continue to be managed under the existing FMP.

Management costs under a framework FMP was estimated assuming one framework action per year. A total annual cost of \$403,000, not including the Coast Guard costs, is expected (a 31% increase over a no FMP approach). The framework FMP costs correlates to approximately 11% of the value of the 1984 domestic bottomfish fishery value. The major areas of increased expenditures occurs under the NMFS enforcement (dockside enforcement practices) and administration.

The costs of management under a conventional FMP is estimated at \$485,000 (approximately 13% of the 1984 domestic bottomfish fishery value) with one FMP amendment per year. Increased costs in the NMFS and WPRFMC administration make up the bulk of the additional costs.

A comparison between a framework versus a conventional FMP approval is discussed in Appendix F. The framework FMP approach with its timeliness in the implementation of any management action is favored.

2.4 Relationship to Applicable Laws and Policies

This FMP presents biological, environmental, economic and social information to provide a framework for management of the bottomfish and seamount groundfish fisheries in the western Pacific and to institute gear restrictions in the bottomfish fishery, a permit requirement for bottomfishing in the FCZ of the NWHI, and a moratorium on harvesting in the seamount groundfish fishery. The information and analysis are intended to satisfy Magnuson Act requirements as well as requirements of other laws and policies. Section 4 provides an overview of the fisheries, the conditions which led to the need for action through the FMP, and the context in which the FMP was prepared. Section 5 describes the management unit in terms of the targeted species and the participants in the fishery. Section 5 also presents the problems and the management objectives established in the FMP to address them. Section 6 sets forth recommendations for Federal actions to govern fishing for the management unit species in the FCZ of the western Pacific region. Section 7 compares the proposed actions with alternative approaches to demonstrate that the selected measures are the most effective for meeting the Council's objectives and are the most cost-effective. Section 8 defines the optimum yield for the fisheries and provides determinations of domestic annual harvest, joint venture processing, and total allowable levels of foreign fishing. Section 8 also discusses the relationship of the proposed actions to MFCMA National Standards. Section 9 discusses the relationship of the FMP to other applicable laws and policies. Section 10 describes plan administration and enforcement. Section 11 details the rules and regulations promulgated for this FMP. Appendix F compares the costs and benefits, to the extent that they are quantifiable, of the alternative management approaches.

2.5 Responsible Agencies

The FMP was prepared by the Western Pacific Regional Fishery Management Council, which was established by the Magnuson Fishery Conservation and Management Act. The Council is comprised of private and public sector representatives from Hawaii, American Samoa, Guam, and representatives of U.S. government agencies. Its primary function is to prepare fishery management plans which recommend Federal regulations and other actions in the Council's area of authority. For further information, contact:

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2.6 Public Review and Comment

The Council is required to obtain public input during plan preparation and to hold public hearings before approving a plan for Federal implementation. Public scoping meetings, as well as formal hearings, were scheduled on early drafts of the FMP during 1985. The Council held public hearings on the final version of the plan as follows:

<u>Date:</u>	<u>Time:</u>	<u>Location:</u>
September 24, 1985	7:00 p.m.	Satellite City Hall 65-670 Farrington Highway Waianae, Oahu, Hawaii
September 25, 1985	7:00 p.m.	United Fishing Agency 117 Ahui Street Honolulu, Oahu, Hawaii
September 26, 1985	7:00 p.m.	Lihue Neighborhood Center 3353 Eono Lihue, Kauai, Hawaii
October 1, 1985	7:00 p.m.	First Hawaiian Bank Conference Room 74-5593 Palani Road Kailua-Kona, Hawaii, Hawaii
October 2, 1985	7:00 p.m.	Hawaii Country Council Room 25 Aupuni Street Hilo, Hawaii, Hawaii
October 3, 1985	7:00 p.m.	Maalaea Boat & Fishing Clubhouse Maalaea, Maui, Hawaii

2.7 List of Preparers

The FMP was prepared by Paul Bartram as consultant to the Council and the Bottomfish Plan Development Team comprised of the following individuals:

Dr. George Boehlert
Chief, Insular Resources Investigation
National Marine Fisheries Service (NMFS) - Honolulu Laboratory

Alvin Katekaru
Marine Section Chief
Division of Aquatic Resources (DAR)
Hawaii Department of Land and Natural Resources
Bottomfish Plan Development Team Chairman

Kurt Kawamoto, Biologist, Contract Services
Western Pacific Regional Fishery Management Council

Samuel Pooley, Industry Economist
National Marine Fisheries Service (NMFS) - Honolulu Laboratory

Dr. Stephen Ralston, Biologist
Insular Stock Assessment Program Leader
National Marine Fisheries Service (NMFS) - Honolulu Laboratory

The Council also acknowledges the contribution of the members of its Scientific and Statistical Committee and its Bottomfish Advisory Subpanel members from Hawaii, Guam, and American Samoa. The Chairman of the subpanel is Frank Farm of Honolulu.

2.8 Glossary of Terms

Definition of terms used in this draft FMP.

Abundance: The number of fish of a species present in an area of interest over a specified unit of time.

Advisory Panel (AP): A Council appointed panel of fishing industry individuals whose purpose is to guide and advise the Council on the development and issues of the fishery management plan (FMP).

Availability: The proportion of a stock that is within the area of a fishery or the range of the type of fishing gear used. Availability may vary yearly and seasonally even when abundance remains nearly constant.

Catch: The number or weight of a particular species or group of species taken in a unit of time.

Catch-Per-Unit of-Effort (CPUE): The average catch taken by a defined unit of fishing effort. In the bottomfish fishery, for example, the number of weight of bottomfish caught per vessel per day or per line-hour of fishing.

Coastal Zone
Management
Act (CZMA):

The principal objective of the Coastal Zone Management Act of 1972 is to encourage and assist States in developing coastal zone management programs, to coordinate State activities and to safeguard the regional and national interests in the coastal zone. CZMA requires that any Federal activity directly affecting the coastal zone of a State be consistent with that State's approved coastal zone management program to the maximum extent practicable.

Domestic Annual
Processing
(DAP):

An estimate of that portion of the harvest by domestic fishing vessels that will be processed on an annual basis by domestic processors.

Domestic Annual
Harvest
(DAH):

An estimate of the total catch of the management unit species that the domestic fleets will make in one year. DAH is equal to the total domestic catch of the management unit species made by all domestic fishing methods in any one year.

Domestic
Fishery
or Fishing:

A fishery conducted by vessels of the United States.

Effort:

A numerical measure of the amount of gear and time used in an attempt to catch fish. Effort may be expressed in terms of number of hooks fished per day, number of boat days, man hours, line hours, etc.

Endangered
Species Act
(ESA):

The Endangered Species Act of 1973 provides for the conservation of endangered and threatened species of fish, wildlife, and plants. The program is administered jointly by the Department of the Interior (DOI) and the Department of Commerce (DOC).

Environmental
Assessment
(EA):

A document prepared by a Federal agency which presents a brief analysis of the environmental impacts of the proposed action and its alternatives, including sufficient evidence to determine that either: (1) an environmental impact statement is required; or (2) a finding of no significant impact should be declared (CEQ sec. 1508.9).

Executive
Order (E.O.)
12291:

This Executive Order applies to the issuance of new rules, the review of existing rules, and the development of legislative proposals concerning regulations. The Order requires that (1) regulatory objectives and priorities be established with the aim of maximizing net benefits to the United States, taking into account the condition of particular industries, State and local governments, and consumers affected by the rule; (2) rules be developed with a cost/benefit approach when possible; (3) the chosen regulatory approach or alternative be the one with the least net cost to society, if practicable; and (4) regulatory action should not be undertaken unless the potential benefits outweigh the potential costs to society.

Fishery:

A fishery is a composite of the following essential components: a resource consisting of a population of a species or set of species usually with similar ecological requirements or characteristics; a number of fishermen who regularly exploit the resource, together with their boats and equipment for harvesting and handling fish; and a market in which fishermen can sell their catch.

Fishery
Conservation
Zone (FCZ):

U.S. waters from the seaward boundary of a State or Territory to 200 nautical miles from the shoreline.

Fishery
Management
Plan (FMP):

A plan prepared by the Council and implemented by the Department of Commerce for the conservation and management of fishery resources in the Fishery Conservation Zone.

Hancock
Seamounts:

That portion of the FCZ in the NWHI west of 180° 00' W. longitude and north of 28° 00' N. latitude.

Magnuson Fishery
Conservation and
Management Act
(MFCMA):

Federal law (P.L. 94-265, passed in 1976 and amended several times in subsequent years) covering fishing activity in U.S. waters between State waters and 200 nautical miles from the coastline.

Main Hawaiian
Islands
(MHI):

The high islands of the State of Hawaii consisting of Niihau, Kauai, Oahu, Molokai, Lanai, Maui, Kahoolawe, and Hawaii (from 154° W. Longitude to 161° 20' W. Longitude).

Management

Unit:

A species or a group of fish species affected or exploited by the same fishery or fisheries.

Management

Unit Species

(MUS):

In this Fishery Management Plan (FMP), the MUS include approximately 22 species of deepwater bottomfish and seamount groundfish.

Marine Mammal

Protection

Act (MMPA):

The Marine Mammal Protection Act (MMPA) enacted in 1972 establishes a moratorium on the taking of marine mammals and a ban on the importation of marine mammal products with certain exceptions. Responsibility is divided between the Department of Commerce (whales, porpoises, seals, and sea lions) and the Department of Interior (other marine mammals) to issue permits and to waive the moratorium for specified purposes, including incidental takings during commercial fishing operations. The Magnuson Act amended the MMPA to extend its jurisdiction to the FCZ.

Maximum

Sustainable

Yield (MSY):

The greatest average amount, in theory, that can be harvested from a population of fish on a continuing basis.

Metric Ton

(MT):

Unit of measure equal to 1000 kilograms or approximately 2200 pounds.

Mortality:

Refers to the death rate in a population from natural and fishery causes. Together these constitute total mortality. Mortality rates can be considered on an instantaneous or an annual basis (instantaneous mortality rates are the limits approached by average rates over progressively shorter periods).

National

Environmental

Policy Act

(NEPA):

The National Environmental Policy Act requires that the effects of Federal activities on the environment be assessed. NEPA's basic purpose is to insure that Federal officials weigh and give appropriate consideration to environmental values in policy formulation, decision-making and administrative actions, and that the public is provided adequate opportunity to review and comment on the major Federal actions. NEPA requires preparation of an EIS for major Federal actions significantly affect the quality of the human environment.

National Marine
Fisheries
Service
(NMFS):

The NMFS has the primary Federal responsibility for the conservation, management, and development of living marine resources and for the protection of certain marine mammals and endangered species under numerous Federal laws. The Agency also has responsibilities to the U.S. commercial and marine recreational fishing industry, including fishermen, and to the States and the general public.

Northwestern
Hawaiian
Islands
(NWHI):

The FCZ of the Hawaiian islands archipelago lying to the west of 161° 20' W. longitude.

Optimum
Yield (OY):

The amount of fish which produces maximum benefits to the Nation, especially considering food production and recreational opportunities.

Overfishing:

A term often used to describe fishing at a level of effort in excess of the level needed to obtain the MSY. The term is also used to imply that fishing has reduced stock to such a level that its reproductive potential is reduced. Overfishing may occur in a fishery at different levels of effort for recreational and commercial users. This may occur, for example, when recreational users prefer fish of smaller size than commercial users.

Plan Develop-
ment Team
(PDT):

A team appointed by the Council to prepare the fishery management plan under the direction of the Council. The PDT utilizes inputs from all committees and panels as well as outside sources in developing the FMP.

Population:

A general term for all the individuals of a species or several species of fish occupying a particular area. A sub-population is a portion of the whole population that is isolated in time or space.

Preliminary
Fishery
Management
Plan (PFMP
or PMP):

A preliminary Fishery Management Plan is prepared by the Council in response to an application to the Secretary of State (SOS) from a foreign nation to fish a particular resource. The plan contains a description of the fishery and provides a Total Allowable Level of Foreign Fishing (TALFF) that is available to all foreign nations. The PFMP is preliminary to a full Fishery Management Plan (FMP).

Production
Model:

One of several mathematical descriptions of the effects of natural and fishing mortality on the size (weight) of a fish population. A mathematical description of the annual added weight to a fishable stock, plus recruits added to it, less what is removed by natural mortality. This figure is usually estimated as the catch in a given year plus the increase in stock size or minus the decrease (Ricker, 1975). The production model is widely used for stock assessment purposes because its inputs are simply data on catch and effort. Because of its simplicity, the model requires a number of assumptions which are often violated.

Recruitment: The rate at which new fish (recruits) enter the fishery by reaching catchable size or reaching an age where their distribution and behavior makes them vulnerable to the fishing gear, or the total amount of recruits added in a given period of time (i.e., the recruitment rate integrated over the time period), or the process of adding recruits.

Regional
Director
(RD):

Southwest Regional Director of the National Marine Fisheries Service (NMFS).

Regulatory
Flexibility
Act (RFA):

The Regulatory Flexibility Act establishes the principle that where Federal regulation is necessary, the regulation should be tailored to the regulated entity's size and capacity to bear the regulatory burden. Effect on FMP process: like E.O. 12291, the RFA requires analysis of costs, benefits, and effective alternatives; it also requires preparation of a Regulatory Flexibility Analysis for rules likely to have a significant economic impact on a substantial number of small entities for review by SBA.

Regulatory
Impact Review
(RIR):

Provides the rationale for the choice of a proposed regulatory action. It includes a cost/benefit analysis and the consequences of all alternatives considered. This also includes the no action alternative.

Scientific and
Statistical
Committee
(SSC):

A committee appointed by the Council to assist it in the development, collection, and evaluation of such statistical, biological, economic, social, and other scientific information as is relevant to such Council's development and amendment of any fishery management plan.

Stock:

A population or portion of a population that can be treated as a single unit for management purposes.

Subsistence
Fishery
(Fishing):

A fishery to obtain food for personal use rather than for sale or recreation.

Total Allowable
Level of Foreign
Fishing
(TALFF):

The TALFF is that portion of the OY that is made available to foreign vessels.

Western Pacific
Regional Fishery
Management
Council
(WPRFMC):

The Western Pacific Regional Fishery Management Council shall consist of the State of Hawaii, the territories of American Samoa and Guam, and the Commonwealth of the Northern Mariana Islands. It shall have authority over the fisheries in the Pacific Ocean seaward of the jurisdiction of such State, territories, Commonwealth, and possessions of the United States in the Pacific Ocean area out to 200 nautical miles from shore.

3.0 SUMMARY

3.1 Proposed Actions

The Western Pacific Regional Fishery Management Council proposes a package of management measures for the bottomfish and seamount groundfish fisheries in the FCZ around Hawaii, American Samoa, and Guam, as follows:

Administrative framework for future regulations -- The plan proposes a "framework" for managing the bottomfish fishery in the FCZ around Hawaii, American Samoa, and Guam. The list of management unit species is covered in Table 5.1 and 5.2. This framework is largely an administrative procedure which describes the processes by which the fishery will be managed and which establishes the limits and controls within which regulatory adjustments may be made. The framework procedure is illustrated in Figure 3.1. A set of heavily-fished species would be routinely monitored and a set of indicators would provide the basis for further investigation. Investigation could result in recommendations to make adjustments in the management system in response to new information. The types of adjustments that could occur include the following:

- o Catch Limits (individual or total harvest)
- o Size Limits
- o Area/Season Closures
- o Fishing Effort Limitation
- o Fishing Gear Restrictions
- o Access Limitation
- o Permit and/or Catch Reporting Requirements for the FCZ
- o Rule-Related Notice System

The framework process includes a thorough evaluation of the biological and economic impacts of any proposed adjustments before their implementation.

Gear restrictions -- Prohibit the use of bottom trawl and bottom-set gillnets to harvest bottomfish in the FCZ.

-- Establish a 6-year moratorium on commercial fishing activities within the FCZ portion of the seamount groundfish fishery to promote the recovery of depleted stocks.

-- Prohibit the use of explosives and poisons for harvesting bottomfish in the FCZ off Hawaii, Guam, and American Samoa. In the FCZ off Hawaii and Guam, this would be consistent with existing State/Territory rules.

NWHI permit -- Require a Federal permit for bottomfishing in the FCZ of the Northwestern Hawaiian Islands (see Appendix A for permit application and attached protected species inclusions).

Experimental fishing permit -- To improve the data base, the Regional Director of NMFS will be authorized to issue a limited number of domestic experimental fishing permits allowing fishing under controlled conditions which might otherwise be prohibited by regulations promulgated through the framework process.

Annual review -- A monitoring team will be appointed by the Council. The Team will prepare an annual review of fishery performance with special emphasis on further investigation of any key indicators which raise concerns.

Data collection procedures -- To obtain the catch/effort data for the annual review, reliance would be placed on existing State and Territory data reporting systems, and a Federal reporting requirement would not be added initially. The Council would consider authorizing Federal data reporting requirements in the event State/Territory systems prove inadequate.

The available evidence indicates that groundfish resources on seamounts throughout the central North Pacific are depressed and that the resources in the Hancock Seamount area within the FCZ are severely depressed (Table 4.2 shows trends in FCZ groundfish catch). The catch per unit of effort of pelagic armorhead at the Hancock Seamounts has declined from a high of over 80 MT/hr in 1972 to about 30 MT/hr in 1978 (Humphreys, et al., 1984) to only 0.29 MT/hr in 1984. Although a TALFF of only 1,000 MT has been allocated each year, the quota has never been attained. Only 72 MT was taken in 1984. It is clear that rebuilding of these stocks could ultimately lead to a renewed fishery both within and outside the FCZ.

The FMP is needed to implement immediately the following proposed actions:

- a) Prohibit bottom trawl and bottom-set nets because these gear-types are non-selective and produce lower quality product than hook-and-line methods; entry of bottom trawlers or gill-netters into the fishery would accentuate the problem of over-capitalization as well as create gear conflicts; lost nets present potential for ghost fishing and bottomfish habitat degradation; lost nets also increase the potential for entanglement of endangered or threatened species which may result in incidental mortalities.
- b) Adopt existing State/Territory measures in the adjacent FCZ to ban the use of explosives and poisons for harvesting bottomfish thereby protecting stocks and habitat in the FCZ from destructive fishing techniques.
- c) Establish a moratorium on seamount groundfish fishing activities for an initial period of 6 years to restore depleted armorhead stocks at the Hancock Seamounts and to facilitate scientific investigations by the National Marine Fisheries Service in assessing the recruitment and recovery process of this fishery.
- d) Establish a permit requirement for the FCZ of the Northwestern Hawaiian Islands (NWHI) bottomfish fishery. The permit requirement would: provide accurate monitoring of increases/decreases in fishing effort; provide entry/exit patterns of the bottomfish fleet; a listing of permitted bottomfish vessels would allow more effective U.S. Coast Guard surveillance; provide essential information for evaluating various management options; and provide the U.S. Fish and Wildlife Service and the NMFS a point of contact for educational purposes dealing with the protected species found in the area.
- e) Establish an Experimental Fishing Permit (EFP) to be issued by the Regional Director of the NMFS. The EFP's would be used to improve the data base and will allow fishing, under controlled conditions which might otherwise be prohibited by regulations promulgated through the framework process.

The FMP also provides the means for identifying management problems/issues of the bottomfish and seamount groundfish fishery and taking

future management actions within the FCZ. The Council has considered the following to be major problems and issues:

- a) Risk of overfishing as the bottomfish fisheries expand rapidly;
- b) Maintenance of social and economic values associated with small-scale commercial, recreational, and subsistence fisheries in areas;
- c) Consistency of management in the FCZ and State/Territorial waters;
- d) Need for timely data to identify and respond to future problems;
- e) Protection of habitat from impacts of destructive gear (e.g., bottom trawls);
- f) Avoidance of interaction with protected endangered and threatened species;
- g) Achievement of economically profitable fisheries; and
- h) Restoration of depleted seamount groundfish stocks.

These problems and related management objectives are detailed in sections 4.3, 4.4, and 5.4

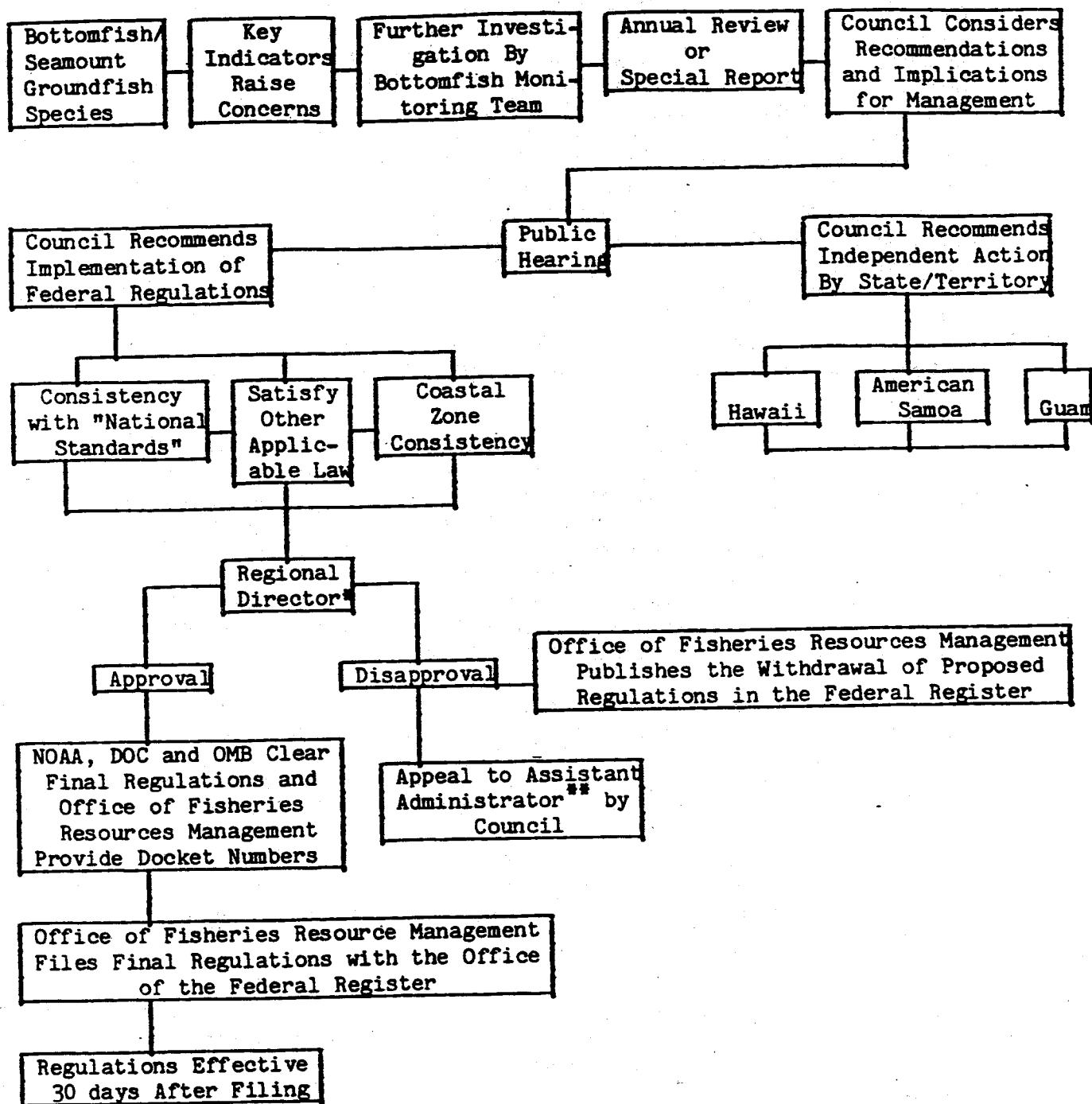
The Council is aware that each management (regulatory) measure proposed for the fishery would have to be justified and be evaluated on its costs and benefits. This FMP provides the historical background for such analysis and establishes a long-term administrative "framework" by which the bottomfish and seamount groundfish fishery in the FCZ of the western Pacific can be effectively monitored and that regulatory adjustments (e.g., catch limits, size limits, area/season closures, access limitation, etc. See Figure 3.2) can be implemented rapidly by the Council in response to new information.

Without an FMP (no action) there would be no management of the bottomfish resources within the FCZ of the western Pacific and the seamount groundfish resources would continue to be managed under the existing Preliminary Management Plan.

Some of the major potential consequences resulting from no action taken by the Council are: longlasting or irreversible damage to the bottomfish habitat in the NWHI; increased incidences of lost bottom-trawl and bottom-set nets that pose entanglement problems for protected, endangered, and threatened marine aquatic animals; instability in NWHI bottomfish production resulting in projected losses of at least \$500,000 per year by 1990 and \$780,000 per year by 2000; the use of explosives and poisons could also produce longlasting or irreversible damage to the habitat as well as increase the risk for indiscriminate harvest of juvenile fish; and loss in timeliness on the part of the Council to effectively manage the bottomfish fishery and thus prevent severe economic disruption to the fishery and long-term impact to the resource.

FIGURE 3.1

ADMINISTRATIVE FRAMEWORK FOR INSTITUTING NEW CONTROLS ON BOTTOMFISHING



* Southwest Regional Director of National Marine Fisheries Service.

** Assistant Administrator for fisheries of the National Oceanographic and Atmospheric Administration.

3.2 Need for FMP

Commercial bottomfish landings as well as fishing effort are at record-high levels in the FCZ off the main Hawaiian Islands and the Northwestern Hawaiian Islands (NWHI). In 1984, the landings were estimated to be 1.4 million pounds, the highest since the period between 1945 to 1948 when the landings averaged around 1 million pounds annually. Although bottomfish landings declined to 400,000 pounds during the 1960's and mid 1970's, they rapidly increased to over a million pounds from 1974 to the present, a direct result of an expanded local market for fresh bottomfish and strong interest in the NWHI stocks. The maximum sustainable yield (MSY) for the fishery has been estimated to be 596,000 pounds for the main Hawaiian Islands and 508,000 pounds for the portion of the NWHI (Nihoa-Northampton Bank) currently being fished. In 1984, the MSY for the main Hawaiian Islands was exceeded by 55%; the MSY for the NWHI was exceeded by approximately 15%. The preliminary 1985 data indicated that the MSY level in the fishable range of the NWHI was exceeded by approximately 33% in 1985. Although the history of landings from American Samoa and Guam is not well known, increasing efforts to exploit the bottomfish resources in these areas are expected.

Several indicators already seem to point to the potential for overfishing in the Hawaiian bottomfish fishery. These are: the average size (weight) of bottomfish, e.g. approximately 36% by number of the opakapaka, caught around the main Hawaiian Islands are below the size of first reproduction (Ralston and Kawamoto, 1985); harvest capacity of the existing fleet exceeds the best estimate of MSY from the entire charted Hawaiian bottomfish habitat; unstable patterns have been observed in the entry/exit pattern of fishermen in the NWHI bottomfish fishery; and there have been significant increases in the total bottomfish landings in all areas of the FCZ.

Although scientific evidence for potential overfishing is not definitive, Hawaii's fishermen have clearly voiced their fear that smaller-sized fish and lower catch per unit effort indicate that the fishery is reaching a danger point. The fishing community itself has already begun to debate the merits of various management measures, with particular interest in access management.

On the seamounts 1,500 miles northwest of the main Hawaiian Islands, there is a distinct change in the deepwater demersal fish fauna from the bottomfish complex to a seamount groundfish complex which includes the pelagic armorhead, alfonsin, raftfish (see Table 5.2 for scientific names), and numerous other species of lesser or no commercial importance.

Newly-acquired Russian catch data suggest that the maximum stock size of pelagic armorhead on all seamounts in the 1969-1975 period was some 400,000 MT (Borets, 1975). At a recent meeting on the resources of the northern Pacific seamounts held in Shimizu, Japan, papers presented by Sasaki (1984) and Wetherall and Yong (1984) documented the decline in the pelagic armorhead stocks.

The seamount groundfish fishery would continue to be managed under the PMP which essentially limits foreign harvest to an annual quota of 2000 metric tons. Without the proposed actions under the FMP, the likelihood that maximum sustainable yield estimates for groundfish species would be improved through scientific research would be reduced. Another potential consequence would be the reduced likelihood of developing a cooperative international management scheme for seamount stocks across their range.

3.3 Consistency with MFCMA National Standards

- a) Prevent overfishing -- The FMP acknowledges that the risk of overfishing appears to be high in the Hawaii FCZ. The biological evidence of overfishing is not definitive at present but, the FMP incorporates an annual review requirement designed to identify problems in the future so that they can be acted on rapidly through an administrative rule-making framework.
- b) Best scientific information available -- The FMP acknowledges the limitations of available data, but the best available information has been used to prepare the FMP and the annual review requirement will result in considerably improved data and analysis for future management.
- c) Inter-related stocks managed as a unit -- The FMP treats Hawaii, American Samoa, and Guam as individual management areas because there is no evidence of the mingling of larval or adult fish among these areas. However, bottomfish stocks in Hawaii, American Samoa, and Guam are treated as a unit throughout their range in the respective areas.
- d) Non-discrimination between residents of different states -- The FMP does not propose any differential licensing programs or other requirements for residents of different states.
- e) Promote efficiency -- The FMP does not restrict the times, places, or methods of bottomfishing except that environmentally-destructive gear (bottom trawls and bottom-set nets) is prohibited in order to protect the limited amount of habitat, to provide added protection for endangered species, and to prevent potential gear conflicts.
- f) Allow for variations and contingencies -- The annual review requirement of the FMP allows for variations and contingencies to be considered by the Bottomfish Monitoring Team when concerns are raised by a prescribed set of indicators. The FMP does not automatically trigger regulations when changes in fishery conditions are indicated.
- g) Minimize costs and avoid duplication -- The FMP provides for a cost-effective means of monitoring for changes in fishery condition and, through an annual review requirement, assessing the need for regulation as problems arise. There is no duplication of existing data reporting requirements.

3.4 Management Problems and Issues Considered

TABLE 3.1

PROBLEMS AND RELATED OBJECTIVES FOR BOTTOMFISH/SEAMOUNT GROUND FISH MANAGEMENT

PROBLEM	OBJECTIVE
<u>Bottomfish</u>	
Increased fishing effort and associated potential for overfishing.	1. Protect against overfishing and maintain the long-term productivity of bottomfish stocks.
Insufficient data to guide long-term management.	2. Improve the data base for future decisions through data reporting requirements and cooperative Federal/State/Territory data collection programs.
Transboundary (Federal/State) distribution of the fishery.	3. Provide for consistency in Federal/State/Territory bottomfish management to ensure effective management across the range of the fisheries.
Limited amount of bottomfish habitat and possible damage to stocks or habitat through the use of destructive harvesting techniques.	4. Protect bottomfish stocks and habitat from environmentally-destructive fishing activities and enhance habitat if possible.
Possible imbalance in the distribution of benefits among commercial, recreational, and subsistence fishery interests.	5. Maintain existing opportunities for rewarding fishing experiences by small-scale commercial, recreational, and subsistence fishermen, including native Pacific islanders.
Possible disruption in the supply or quality of fresh bottomfish available to the domestic market.	6. Maintain consistent availability of high quality products to consumers.
Possible overcapitalization of the Northwestern Hawaiian Islands' bottomfish harvesting capacity.	7. Maintain a balance between harvest capacity and harvestable fishery stocks to prevent over-capitalization.

TABLE 3.1

PROBLEMS AND RELATED OBJECTIVES FOR BOTTOMFISH/SEAMOUNT GROUNDFISH MANAGEMENT
(Continued)

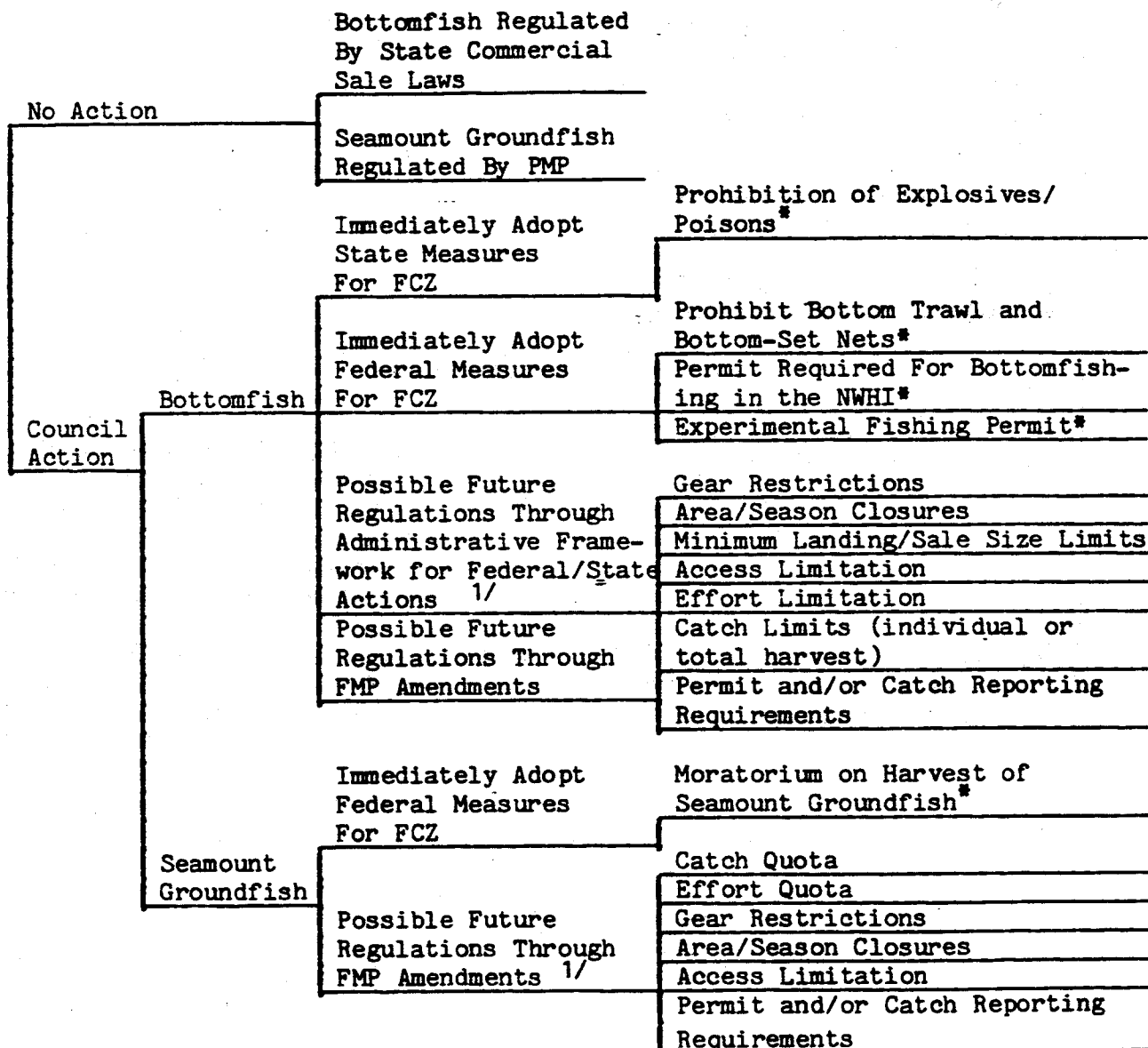
PROBLEM	OBJECTIVE
<u>Bottomfish</u>	
Increased participation in the Northwestern Hawaiian Islands' bottomfish fishery by fishermen unfamiliar with that region, with a corresponding increase in the risk of vessel groundings, and injury of individual animals through various fishing operations, i.e. hooks and/or fishermen, and the potential for use of net gear that would have adverse impacts on threatened or endangered marine species.	8. Avoid the taking of protected species and minimize possible adverse modifications to their habitat.
<u>Seamount Groundfish</u>	
Depleted groundfish stocks.	9. Restore depleted groundfish stocks and to provide the opportunity for U.S. fishermen to develop new domestic fisheries for seamount groundfish which will displace foreign fishing.
The stocks of many, if not most, of the groundfish species, range across the FCZ into international waters.	10. Monitor stock recovery of depleted stocks in the FCZ so that any international plan of action for managing the common resource can be guided by experimental results.

3.5 Alternatives Considered

The alternatives and the immediate actions considered for managing the bottomfish and seamount groundfish fisheries are illustrated in a decision tree format in Figure 3.2.

FIGURE 3.2

REGULATORY OPTIONS OPEN TO THE COUNCIL FOR MANAGING BOTTOMFISH AND SEAMOUNT GROUNDFISH FISHERIES



* Measures proposed for immediate adoption.
^{1/} Preferred alternative.

3.6 Determinations in the FMP

3.6.1 Maximum Sustainable Yield (MSY)

The FMP acknowledges the limitations of available data for accurate assessment of the maximum sustainable yield (MSY) in both the bottomfish and seamount groundfish fisheries. However, provisional estimates of MSY can be provided, as follows:

<u>Area</u>	<u>Provisional Estimate of MSY (Tons/Year)</u>	<u>Source</u>
American Samoa	34	Extrapolation of MSY estimate per unit of habitat for Guam
Guam*	28	Polovina et al., 1985
Main Hawaiian Islands (MHI)	298	Ralston and Polovina, 1982
Northwestern Hawaiian Islands (Nihoa-North-hampton Seamounts)**	254	Extrapolation of MSY estimate per unit of habitat for MHI (Ralston and Polovina, 1982)
Hancock Seamounts	<1,100	Japanese have never caught their 1,000 mt annual allocation

* Guam and associated banks.

** NWHI area presently being fished.

3.6.2 Optimum Yield (OY)

The OY to be achieved from the fisheries for species included in the management unit addressed by this framework plan is the amount of bottomfish caught by U.S. fishermen in the FCZ and adjacent waters around Hawaii, Guam, and American Samoa under the management measures implemented under the FMP to achieve to the greatest extent practicable the management objectives (see Table 3.1). Initial estimates of the amounts which will be harvested are shown in Table 8.5.

Each year, as part of the process of reviewing the prior year's fishery and assessing the need for regulatory adjustments, the Council will consider whether any species or species group in any area needs to be managed on a numerical basis.

The OY for seamount groundfish in the FCZ of the Hancock Seamounts initially is set at zero (0) metric tons (mt) per year through 1990.

3.6.3 Domestic Annual Harvest (DAH)

The reasons for defining OY in non-numeric terms also apply to the definition of DAH, which, for the purposes of the FMP, is the quantity of each species in the management unit that will be caught by domestic vessels in the FCZ under the management measures implemented under the FMP to achieve, to the greatest extent practicable, the management objectives. Initial estimates of the quantity which will be harvested are shown in Table 8.5.

3.6.4 Total Allowable Level of Foreign Fishing (TALFF)

In the bottomfish fishery, the existing fleets in Hawaii, American Samoa, and Guam have sufficient harvesting capacity to take the entire maximum sustainable yield and optimum yield. Hence, the amount of bottomfish species available for TALFF is zero (0). Until an optimum yield is re-established for the Hancock Seamount fishery, the amount of seamount groundfish available for TALFF is also zero (0).

3.6.5 Domestic Annual Processing (DAP) and Joint Venture Processing (JVP)

All of the landings of bottomfish species enter local markets in fresh product forms. Although frozen bottomfish products may become more acceptable in established market, there is no reason to believe the DAP will be other than zero (0). There is no processing (in the industrial sense) of domestic catches of bottomfish. Until an OY is re-established for the Hancock Seamount fishery, the amount of seamount groundfish available for JVP is zero (0).

3.7 Impacts Anticipated

- a) The proposed action is expected to benefit the long-term productive capability of the stocks. The framework process will promote timely action by the Council/NMFS to address resource problems (if any) in a flexible manner as they are identified. The cooperative State/Territory/NMFS data collection and analysis program will ensure that necessary data are available at minimal additional cost. The moratorium for the seamount fishery will permit depleted stocks to rebuild. The prohibition on net use will limit the risk of waste associated with non-selective gear and reduce the potential for taking substantial numbers of small fish;

- b) The proposed action will not allow substantial damage to the ocean and coastal habitats. The prohibition on net use will prevent habitat damage;
- c) The proposed action will not have an adverse impact on public health and safety. The markets for bottomfish have established high quality standards. The proposed action should promote maintenance of these standards;
- d) The proposed action is not expected to affect adversely any endangered or threatened species (Appendix J). The prohibition on trawl and bottom-set nets to harvest bottomfish will remove much of the risk of incidental taking of Hawaiian monk seals and sea turtles by bottomfish fishermen;
- e) The proposed action will not result in cumulative adverse effects that could have a substantial effect on the target resource species or any related stocks that may be affected by the action. The proposed action will establish a monitoring and reporting program to determine if the objectives of the plan are being achieved and to identify corrective actions if resource problems are subsequently identified;
- f) The proposed action will protect against damage to scientific resources of the NWHI. No scientific, cultural or historic resources will be affected;
- g) The proposed action is intended to maintain the economic and social values associated with establish small-scale commercial, recreational and subsistence fisheries around the populated islands in Hawaii, Guam, and American Samoa. Most of the fishing in these areas occurs in the territorial sea, under control by the respective island governments. The framework process provides for systematic, cooperative assessment of fishery conditions within the FCZ and territorial seas so that problems and solutions can be identified;
- h) The proposed action will promote rebuilding of seamount groundfish stocks so that an economically viable fishery can be resumed;
- i) Controversy - The Council has worked closely with State and Territory officials and the fishing community in developing the management program over the past 3 years. The risk of controversy appears to be low; and
- j) Uncertainty - The data base has improved substantially in the past several years. The Council has worked closely with the industry to obtain current data. The Honolulu Laboratory, Southwest Fishery Center (SWFC), U.S. Fish and Wildlife Service, and State of Hawaii conducted a five-year Tripartite Survey of the NWHI which greatly

expanded the knowledge about fishery potentials. The Honolulu Laboratory also has conducted or funded a substantial amount of economic research and has assisted Hawaii, Guam, and American Samoa in establishing effective data management systems. While there is some uncertainty about how fishery participants will operate in the future and about stock responses to fishing pressure, the proposed action provides a mechanism to assess changes and implement new measures if necessary. Therefore, uncertainty is not a significant problem.

4.0 INTRODUCTION

Bottomfish is an important commercial and recreational deepwater complex of species in American Samoa, Guam, and Hawaii. Recent evidence suggests that some species of this complex may be on the verge of being overfished and that fishing effort has been expanding on an annual basis. To prevent the possibility of overfishing and substantial public loss through declines in the bottomfish stocks, the Western Pacific Regional Fishery Management Council has prepared a fisheries management plan which will create an administrative framework for proposing new fishing regulations for bottomfish and seamount groundfish fisheries in the U.S. Fishery Conservation Zone (FCZ). This "framework" management process is detailed in Section 6.2.

The bottomfish fishery is a mainstay of the small-scale developing fisheries of American Samoa and Guam. Although the number of boats engaged in commercial bottomfishing is less than 100, they represent the majority of commercial fishing enterprises in these areas and are important to the local economies. In Hawaii, the main island commercial fishery is comprised of some 100 vessels landing bottomfish regularly and perhaps 1,000 vessels which land bottomfish intermittently. The Northwestern Hawaiian Island fishery is a commercial large-boat fishery involving approximately 20 vessels. Although these vessels could be converted to pelagic and shellfish gears, they are predominantly considered single-purpose vessels which target bottomfish.

The impetus for bottomfish management arose in the western Pacific from generally-shared perceptions of fishermen, scientists, and managers that fishing had deteriorated in some areas, that major changes in the amount of fishing effort had recently or were about to occur, and that an allocation problem between large and small users could conceivably occur.

Although the scientific evidence of potential overfishing is not definitive, the biological nature of many bottomfish species seems to preclude their rapid recovery from overfishing. Hawaii fishermen have clearly voiced their fear that smaller-sized fish and lower catch rates are reaching a danger point. The scientists are engaged in a number of research projects to evaluate the available evidence and reach conclusions about appropriate management measures. The fishing community itself has debated the merits of various measures as well. The essential feature of this management plan is that it provides a low-cost means for implementing management measures in a timely manner once their need and justification is established. Each measure would have to be evaluated on its costs and benefits and this FMP provides the framework and historical background for such analysis. The FMP cannot evaluate all the aspects of specific future decisions because of uncertainty about what decisions will be made.

4.1 Importance of the Bottomfish and Seamount Groundfish Fisheries

4.1.1 Bottomfish

The western Pacific bottomfish complex includes approximately 20 commercially or recreationally important species of snappers, groupers, jacks, and emperorfishes (see Table 5.1 for scientific names) and many others of the same families of lesser or no importance. The fishery for these species is of high value due to fresh fish market prices, consumer demand, and cultural attraction in Pacific island communities. The bottomfish fishery is a source of income and employment, provides recreation and nutrition, and satisfies social customs and lifestyles.

The snapper-grouper-jack-emperorfish complex contributes about 11 percent of the total weight caught and 15 percent of the combined value of the commercial fisheries in the western Pacific FCZ (see Table 4.1). Prices for whole fresh bottomfish sold in Hawaii averaged \$2.65 per pound, ex-vessel, in 1984, reaching a high of \$11.85 per pound for opakapaka (Pristipomoides filamentosus) in April 1984.

TABLE 4.1

RELATIVE IMPORTANCE OF THE 1984 DOMESTIC COMMERCIAL FISHERIES
IN THE WESTERN PACIFIC FCZ

Species Group	FCZ CATCH		Value of FCZ Catch (Million\$)
	MT	T	
Tunas	3,545	3,900	\$12.9
Non-Tuna Pelagic Species	701	771	2.6
Bottomfish	600	660	3.8
Shellfish	488	537	2.8
TOTAL	<u>5,334</u>	<u>5,868</u>	<u>\$21.6</u>

Source: WPRFMC, unpublished data.

The recreational (non-market) value of bottomfish landings is also significant, although poorly documented. The proportion of the total main Hawaiian Islands' bottomfish landings attributed to the recreational component of the fishery has increased considerably in recent years. The National Marine Recreational Fishing Survey indicated that over 200,000 pounds of opakapaka and related species were caught in 1981 by recreational fishermen in Hawaii, with smaller quantities caught

by recreational fishermen in American Samoa and Guam (NMFS, Honolulu Laboratory, unpublished data from National Marine Recreational Fishing Survey). It is estimated that 50% of the offshore fish catch (harvested Seaward of the reef) on Guam is not sold commercially (K.E. Knudson, contract WPC 0983 progress report, 6/5/84).

4.1.2 Seamount Groundfish

On the seamounts 1,500 miles northwest of the main Hawaiian Islands, there is a distinct change in the deepwater demersal fish fauna from the bottomfish complex to a seamount groundfish complex which includes the pelagic armorhead, alfonsin, raftfish (see Table 5.2 for scientific names), and numerous other species of lesser or no commercial importance. No U.S. fishermen have commercially harvested the seamount groundfish resource, but foreign trawl harvest of armorhead and alfonsin has occurred since the late 1960s. Foreign catches have declined in recent years, and only a small portion of the overall foreign fishery is conducted at the Hancock Seamounts inside the FCZ. The 1984 catch from the FCZ was only 72.7 metric tons, compared to a high of 795.2 metric tons in 1980 (see Table 4.2).

TABLE 4.2

TRENDS IN THE FCZ CATCH OF SEAMOUNT GROUND FISH (ALL SPECIES)

Year	FCZ Catch	
	MT	T
1977	22.0	24.2
1978	416.0	457.6
1979	217.8	239.6
1980	795.2	874.7
1981	647.0	711.7
1982	390.3	429.3
1983	163.3	179.6
1984	72.7	80.0

4.2 Goals of Fisheries Management in the FCZ

4.2.1 Bottomfish

The goal of the Council in managing the bottomfish fishery in the FCZ is to achieve and maintain bottomfish production at a level that

will support a stable and profitable commercial fishery, as well as a rewarding recreational and subsistence fishery, and that will furnish a consistently available supply of high quality products.

4.2.2 Seamount Groundfish

The goal of the Council in managing the groundfish fishery in the FCZ around the Hancock Seamounts is to replenish the armorhead and alfonsin stocks as a contribution to a profitable domestic commercial fishery that will furnish high quality products.

4.3 Problems for Resolution and Objectives of the FMP

Early in the plan development process, the Council identified problems and related management objectives for the bottomfish and seamount groundfish fisheries. These broad objectives are summarized in Table 4.3 and are discussed in detail in Section 5.4. The central problem in the bottomfish fisheries of the main islands of American Samoa, Guam, and Hawaii is that fishing pressure, both in terms of number of vessels and in relative fishing power (technology), has increased dramatically in the past ten years. Although the biological signs are not yet definitive, the risk of overfishing is growing. The same is true in the NWHI where a commercial fishery was recently developed. At the Hancock Seamounts, the cause for groundfish stock collapse in recent years is uncertain, but a rebuilding/research program is planned for the next six years.

4.4 Relationship Between Objectives

The Council recognizes that not all management objectives will be achieved to the same degree. Implementation of the FMP can make a positive contribution to most of the objectives, but achievement of all objectives will require cooperation by the private sector and by the State/Territory governments, as well as Federal implementation of the FMP.

TABLE 4.3

PROBLEMS AND RELATED OBJECTIVES FOR BOTTOMFISH/SEAMOUNT GROUND FISH MANAGEMENT

PROBLEM	OBJECTIVE
<u>Bottomfish</u>	
Increased fishing effort and associated potential for overfishing.	1. Protect against overfishing and maintain the long-term productivity of bottomfish stocks.
Insufficient data to guide long-term management.	2. Improve the data base for future decisions through data reporting requirements and cooperative Federal/State/Territory programs.
Transboundary (Federal/State) distribution of the fishery.	3. Provide for consistency in Federal/State/Territory bottomfish management to ensure effective management across the range of the fisheries.
Limited amount of bottomfish habitat and possible damage to stocks or habitat through the use of destructive harvesting techniques.	4. Protect bottomfish stocks and habitat from environmentally-destructive fishing activities and enhance habitat if possible.
Possible imbalance in the distribution of benefits among commercial, recreational, and subsistence fishery interests.	5. Maintain existing opportunities for rewarding fishing experiences by small-scale commercial, recreational, and subsistence fishermen, including native Pacific islanders.
Possible disruption in the supply or quality of fresh bottomfish available to the domestic market.	6. Maintain consistent availability of high quality products to consumers.
Possible overcapitalization of the Northwestern Hawaiian Islands' bottomfish harvesting capacity.	7. Maintain a balance between harvest capacity and harvestable fishery stocks to prevent over-capitalization.

TABLE 4.3

PROBLEMS AND RELATED OBJECTIVES FOR BOTTOMFISH/SEAMOUNT GROUND FISH MANAGEMENT
(Continued)

PROBLEM	OBJECTIVE
<u>Bottomfish</u>	
Increased participation in the Northwestern Hawaiian Islands' bottomfish fishery by fishermen unfamiliar with that region, with a corresponding increase in the risk of vessel groundings, and injury of individual animals through various fishing operations, i.e. hooks and/or fishermen, and the potential for use of gear that could have adverse impacts on threatened or endangered marine species.	8. Avoid the taking of protected species and minimize possible adverse modifications to their habitat.
<u>Seamount Groundfish</u>	
Depleted groundfish stocks.	9. Restore depleted groundfish stocks and to provide the opportunity for U.S. fishermen to develop new domestic fisheries for seamount groundfish which will displace foreign fishing.
The stocks of many, if not most, of the groundfish species, range across the FCZ into international waters.	10. Monitor stock recovery of depleted stocks in the FCZ so that any international plan of action for managing the common resource can be guided by experimental results.

4.4.1 Bottomfish

Objective 1 reflects the mandate of the Magnuson Act to prevent "overfishing". However, a definitive and timely assessment that overfishing is occurring requires an improved data base (Objective 2).

Objective 3 reflects the Council's view of the importance of State and Territory governments in managing western Pacific bottomfish fisheries and the preference for a coordinated Federal/State approach to fishery management rather than unilateral Federal action. Objective 4 is intended to protect bottomfish habitat, which is a key factor inherently limiting the biological yield of the fishery. Objective 5 recognizes the diversity of the small-boat fleets which participate in the fishery off the main Hawaiian Islands, American Samoa, and Guam. This objective reflects the Council's view that large social values are generated by maintaining open access for diverse fisheries interests in these areas. Objective 6 reflects the Council's view that the FMP should not accentuate the existing fluctuations in fresh fish supply which characterize island markets. Objective 7 recognizes the need to maintain the bottomfish stocks of the Northwestern Hawaiian Islands at a level which will promote commercial fishing. If stocks are overfished throughout their range in Hawaii, scarcities will ultimately raise consumer prices and will disrupt the commercial fishing industry. Objective 8 recognizes that increased bottomfishing activity in the NWHI may carry with it a potential for adverse impacts on protected marine species or their habitats.

4.4.2 Seamount Groundfish

Objective 9 reflects the mandate of the Magnuson Act to encourage increased domestic harvest of underutilized species. U.S. fishermen cannot possibly develop a new fishery with groundfish stocks at such low levels as presently exist. Even if no domestic fishery is forthcoming, stock rebuilding would be beneficial in terms of the U.S. "fish and chips" policy upon which foreign fishing allocations are based. Objective 10 promotes the concept of international management of fish stocks which range across the FCZ into international waters.

In conclusion, the Council has adopted a set of objectives which are consistent with the defined management goals, with the purposes of the Magnuson Act, and with U.S. policies regarding protected marine species and foreign fishing allocations.

4.5 Context for Management Decisions

4.5.1 Habitat-Limited and Recruitment-Limited Resource

The distribution of adult bottomfish in the western Pacific is closely linked to suitable physical habitat. Hard bottom and high relief seem to be key elements, particularly for groupers. It is not clear how

strongly the occurrence of food items is controlled by this type of physical habitat. The breadth of diet shown by most groupers and particularly snappers suggests that the strong substratum dependency is probably based on shelter rather than prey distribution (J. Parrish, draft ms., 1985).

Deepwater snapper and grouper adults establish a home range on the drop-off, the boundary between the narrow terraces and steep slopes that surround the western Pacific islands. Ulua (Carangidae) and the uku (Aprion virescens) appear to be less constrained by substratum association than groupers and Pristipomoides snappers. Ulua and uku forage throughout much of the water column and can even be caught with a surface lure. Even Pristipomoides snappers are moderately mobile for bottomfish, rising 10-20 fathoms above the bottom to feed. They may also travel miles from a home base and, as a result, fishermen may sometimes find their regular bottomfishing grounds temporarily vacated.

Continued expansion of fishing effort would have a detrimental impact on bottomfish yields. Bottomfish production off western Pacific islands is inherently limited because only a narrow portion of the ocean bottom satisfies the depth requirements of most bottomfish species. Unlike the continental shelf ecosystems on the mainland U.S., the Pacific islands are primarily volcanic peaks with steep drop offs and limited shelf ecosystems. Moreover, bottomfish populations are not evenly distributed within their natural habitat. Fishable concentrations occur in pockets, and when discovered, these pockets are heavily fished. Commercial fishing experience, as well as fishing experiments conducted by researchers, have demonstrated that intensive fishing on small banks reduces bottomfish stocks and catch rates in a remarkably short time.

Yield estimates in the western Pacific bottomfish fishery are usually estimated on the basis of a yield per unit of bottomfish habitat. As bottomfish are concentrated along the submarine drop-off zones centered around the 100-fathom isobath, the length of the 100-fathom isobath around an island or bank is frequently used as an index of bottomfish habitat rather than an area measure which is difficult to compute for the steep-sloped Pacific islands (J. Polovina, draft ms., 1985).

TABLE 4.4

INDEX OF BOTTOMFISH HABITAT

Island Area	Approximate Length of 100-Fathom Isobath	
	<u>nmi</u>	<u>km</u>
American Samoa	169	313
Guam	138	255
Main Hawaiian Islands	997	1,846
Northwestern Hawaiian Islands	1,231	2,280

After initial catches of old, large fish decline to reduced catches of much smaller fish, fishermen shift to new or less-exploited pockets of bottomfish. When fishing effort increases to the extent that most pockets within the range of fishing vessels have already been fished, then a decline in overall production is inevitable. However, there is presently no evidence to demonstrate that stock reduction has reached a level where subsequent recruitment has been affected, even in areas where the catch is comprised of a large proportion of small fish.

Stock depletion on a scale ranging from local populations to entire banks is an inevitable result of the bottomfish fishery. The need to "rest" heavily-fished grounds is a well-known method of stock conservation once voluntarily practiced by professional fishermen in Hawaii. Rotation of bottomfishing grounds allowed local stocks to recover from intensive fishing (C. Yamamoto, pers. comm., 1983). According to statements made at recent public meetings in Hawaii (August 1984), fishermen no longer rotate bottomfishing grounds to allow local fish populations to recover from intensive fishing because they believe competitors will not exercise the same self-restraint (WPRFMC, 1984).

The "cost" of overfishing, in the absence of effective management, is directly related to the recovery times required for depleted bottomfish populations to rebuild to harvestable levels. Recovery times depend on the nature of the reproductive biology and recruitment of the affected species. Recruitment may occur through the return of larval fish to the adult habitat where they were spawned or it may occur through the settlement of larval fish which was spawned at distant islands and banks and dispersed long distances by the currents. The juveniles of certain species seem to be more limited in depth distribution than the adults of the same species. According to fishermen, banks which shoal to 60 fathoms are shallow enough for opakapaka recruitment, but banks whose shallowest areas are 100 fathoms do not harbor opakapaka.

Recruitment of juvenile fishes to reefs in Hawaii was monitored by Walsh (1984), who found that many species exhibited strikingly low levels of recruitment over a 51-month period. Loss of larval fish to offshore or other unfavorable currents may be responsible for low levels of juvenile recruitment described in this and other Hawaii studies (Walsh, 1984). This generalization probably also applies to deepsea bottomfish. Hawaii fishermen have noted that after catch rates of an opakapaka population are reduced to a low level by intensive harvesting, it may take 3 years for the same population to become economically feasible to fish again (WPRFMC, 1984). There is some scientific support for a 3-5 year recovery time based on growth rates of selected bottomfish species reported in the literature. However, if the original population of a heavily-fished bank does not produce enough larvae after stock depletion, recovery could take much longer than 3-5 years. Recovery as a result of larval dispersal over great distances would be a chance event, subject to favorable oceanographic conditions.

4.5.2 Geographic Context

The Council's area of jurisdiction (see Figure 4.1) is the FCZ around Hawaii (648,000 square miles, 1.7 million sq. km), American Samoa (75,000 square miles, 194,000 sq. km), Guam (60,000 square miles, 155,000 sq. km), and U.S. commonwealth and possessions in the Pacific (476,000 square miles, 1.2 million sq. km). Bottomfishing is non-existent or is relatively undeveloped in the FCZ around the U.S. commonwealth and possessions. If bottomfishing ever develops to the level that management should be considered for this portion of the FCZ, amendments to the FMP will be considered.

Bottomfishing is intensive off the main Hawaiian Islands, American Samoa, and Guam; however, most of the catch is harvested in the territorial seas rather than in the FCZ. In the main Hawaiian Islands, the southern tip of the Penguin Bank, a major bottomfishing area, is in the FCZ. This bank lies 18 nautical miles (33 km) from Honolulu and 40 nautical miles (74 km) from Maui's closest boat landing sites. In American Samoa, banks 20 to 35 nautical miles (37-65 km) east and south of the populated islands are in the FCZ; however, these banks are only lightly fished at present. Large banks 15 to 30 nautical miles (28-56 km) south of the island of Guam are in the FCZ, and bottomfish have been exploited there in the past. At present, no boats are known to range this far from Guam for bottomfish.

The major FCZ fishery for bottomfish is in the Northwestern Hawaiian Islands. The fishery lies 250 to 1,260 nautical miles (463-2,333 km) from Honolulu in an area of rough seas and dangerous currents.

The Hancock Seamounts, a part of the northern extent of the Hawaiian Ridge, is located within the FCZ (see Figure 4.2) some 1,500 nautical miles (2,778 km) northwest of Honolulu. The large-scale foreign seamount groundfish fishery once extended throughout the southeastern reaches of the Northern Hawaiian Ridge that lies 2,400 nautical miles (4,444 km) from Tokyo and 3,000 nautical miles (5,556 km) from Vladivostok. The present foreign fishery is greatly reduced compared to historical patterns.

For generalized maps of major bottomfishing and seamount fishing grounds, readers are referred to Appendix B.

4.5.3 Legal Context

The Western Pacific Regional Fishery Management Council was established under the Magnuson Fishery Conservation and Management Act of 1976 (P.L. 94-265, as amended) to develop management plans for fisheries

within the U.S. Fishery Conservation Zone around Hawaii, the territories (American Samoa, Guam), commonwealth, and possessions of the United States in the Pacific Ocean. Exclusive U.S. jurisdiction over all fish (except tunas) in the zone was established by the Magnuson Act. All fishery management plans must be consistent and must comply with various federal laws and requirements such as the Marine Mammal Protection Act, Endangered Species Act, Regulatory Flexibility Act, National Environmental Policy Act, etc. as described in Section 9.0. After a plan is approved by the Federal government, it is implemented by Federal regulations and enforced by the National Marine Fisheries Service (NMFS) and the U.S. Coast Guard.

The inner boundary of the FCZ is a line coterminus with the seaward boundaries of Hawaii, American Samoa, and Guam. The outer boundary is a line drawn in such a manner that each point is 200 nautical miles from the baseline from which the territorial sea is measured. Federal regulations implemented under a FMP usually apply only to the FCZ, although Federal landing laws may affect non-FCZ activities as well.

The Magnuson Act does not explicitly or implicitly preempt State enforcement of its fishery laws in Federal waters beyond the territorial sea. Preserved to the States is the authority to regulate State-registered vessels in the FCZ, but no State may directly or indirectly regulate any fishing engaged in by any vessel outside the territorial sea unless the vessel is registered under the laws of the State.

The State and both territories have Federally-approved Coastal Zone Management (CZM) programs which call for the conservation of marine resources and require that government activities directly affecting the coastal zone be consistent with approved CZM plans. State CZM policy generally requires consistency of Federal with State fishing laws/rules.

A minimum size limit for sale in Hawaii, a prohibition in all areas on the use of poisons for fishing, and a prohibition against the use of explosives in Hawaii and Guam are the State/Territory management measures which affect the harvest of bottomfish in the western Pacific. Stock assessments were the basis for few of the existing regulations.

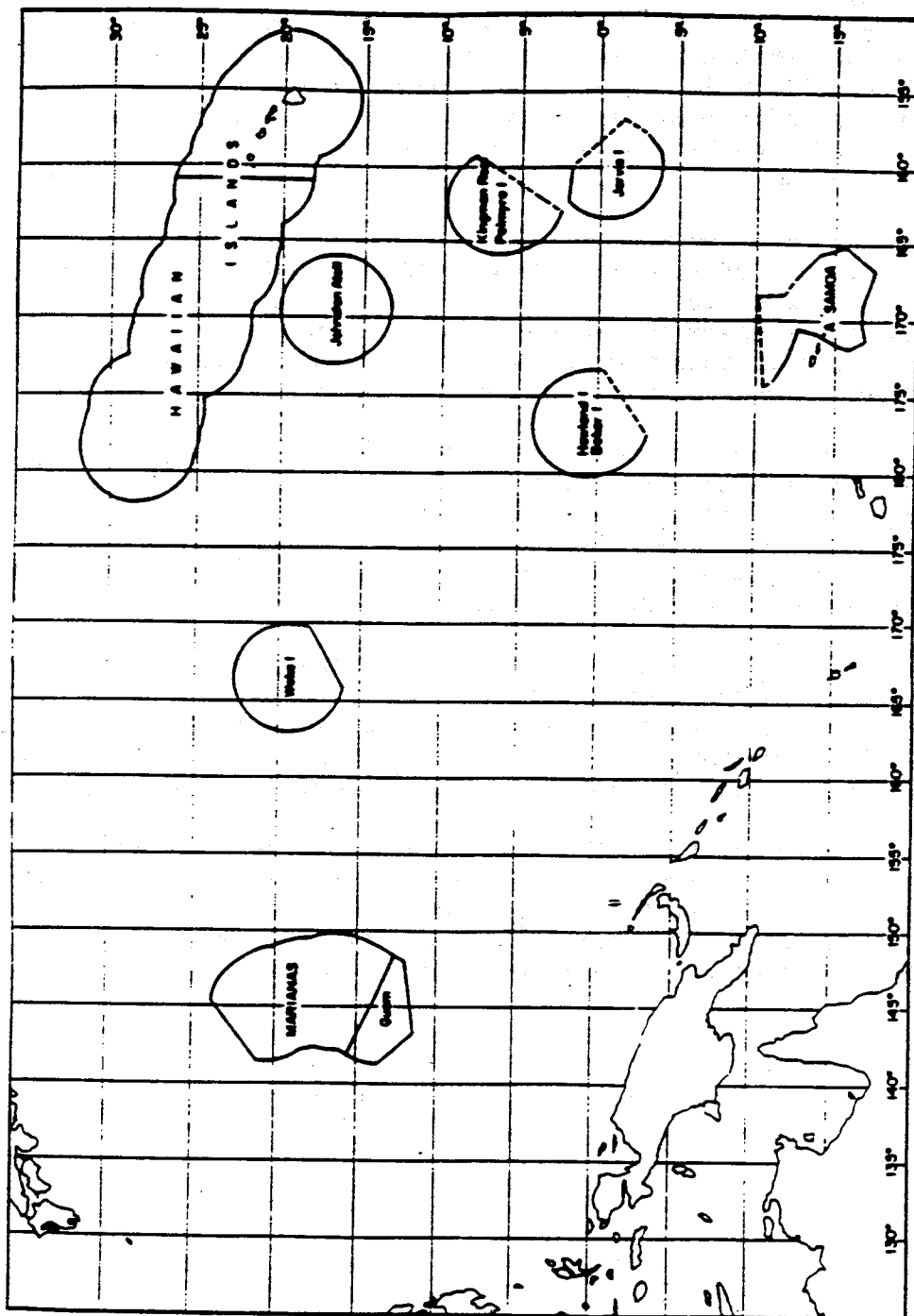


FIGURE 4.1 APPROXIMATE BOUNDARIES OF THE U.S. FISHERY CONSERVATION ZONE
AROUND HAWAII, AMERICAN SAMOA, GUAM, THE NORTHERN MARIANA ISLANDS,
AND U.S. POSSESSIONS

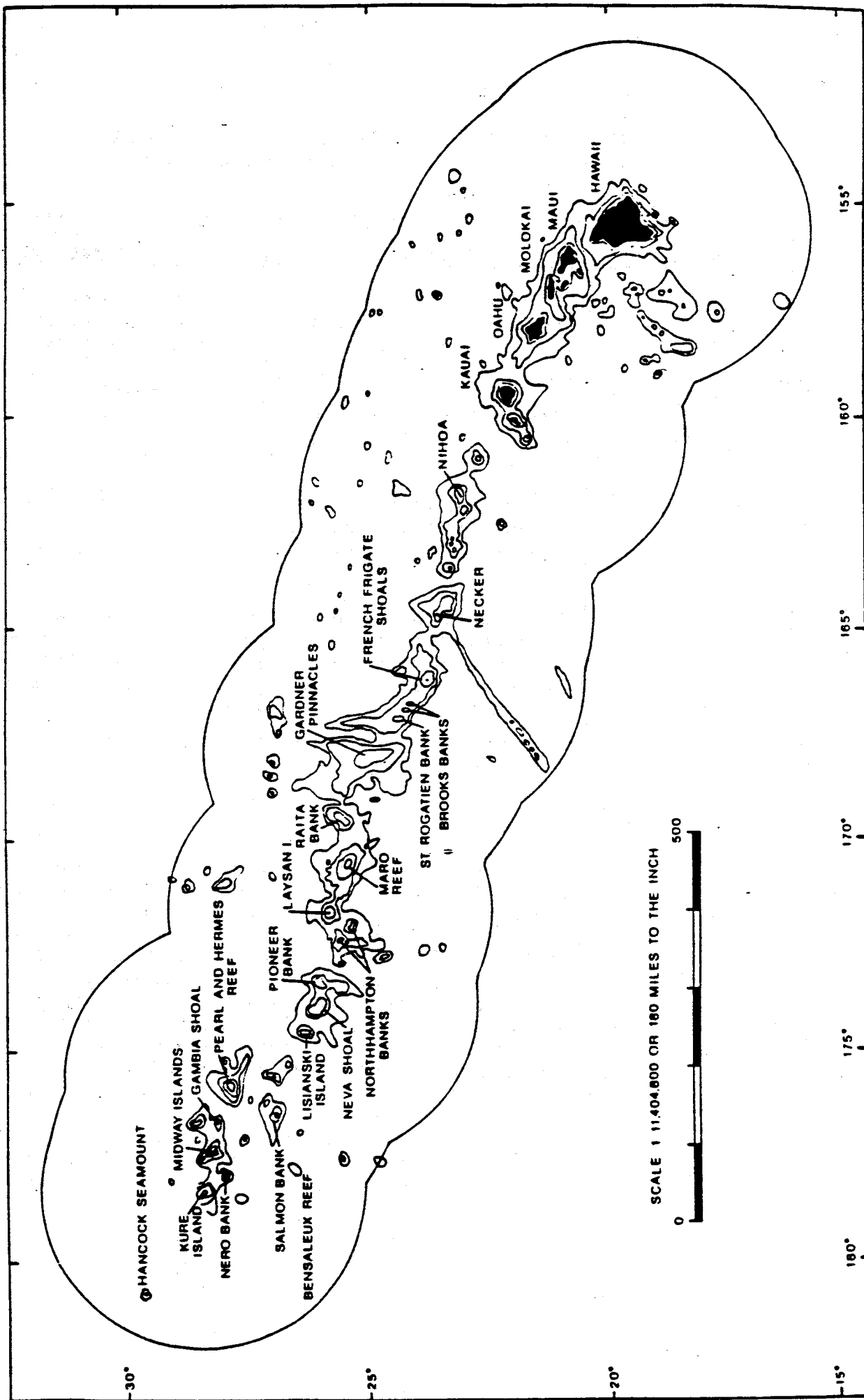


FIGURE 4.2 NORTHWESTERN HAWAIIAN ISLANDS AND NEARBY SEAMOUNTS

TABLE 4.5

**SUMMARY OF EXISTING STATE/TERRITORY LAWS AND RULES
WHICH AFFECT HARVESTING OF BOTTOMFISH**

Jurisdiction	Law/Rule	Effect on Bottomfish Stocks/Habitat
Territory of American Samoa	Prohibition against the "reckless use" of poisons for harvesting fish.	Protects bottomfish habitat from destructive fishing techniques.
Territory of Guam	Prohibition on use and possession of explosives, poisons or intoxicating substances.	Same as above.
State of Hawaii	Prohibition on the use and possession of explosives, poisons or intoxicating substances. Prohibition on the sale by fishermen or possession by fish dealers of onaga, opakapaka, uku, and ulua under one pound.	Same as above. Deters non-selective gear types that could potentially harvest large concentrations of juvenile recruits.

4.5.3.1 Hawaii

The State has established a minimum size limit of one pound for opakapaka, ula'ula (onaga), uku, and ulua (scientific names shown in Table 5.1) which are offered for sale or in the possession of a fish dealer. This size limit is too small to have a positive effect on the biological yield of the stocks since it is substantially below size at onset of sexual maturity of most of the regulated species and below the size of entry of most regulated species to the hook-and-line fishery. However, it acts as a deterrent to non-selective gears which could indiscriminately harvest concentrations of small bottomfish recruits.

Except for a prohibition on the use and possession of explosives and poisons for fishing (H.R.S. 188-23), no other laws or rules presently exist that would affect harvesting of

deepsea bottomfish. However, the Department of Land and Natural Resources has broad authority (Hawaii Revised Statutes 197-2) to make administrative rules that may include size limits, bag limits, open and closed seasons, or specifications of fishing gear which may be used or possessed.

In addition, H.R.S. 188-37 provides the State Department of Land and Natural Resources with special authority to regulate the fishing in the "... islands, reefs, and shoals, as well as their respective appurtenant reefs and territorial waters" of the Northwestern Hawaiian Islands. The Department may issue permits to licensed fishermen and may limit the number of permits issued to take marine life, with the limitation based on the order of application for permits.

4.5.3.2 Guam

Although the Territory has provided broad authority to the Guam Division of Aquatic and Wildlife Resources to regulate several dimensions of fish harvesting, only a few regulations have actually been promulgated. Of these, only the prohibition on the use and possession of explosives and poisons or intoxicating substances by fishermen could have any impact on the harvest of bottomfish.

4.5.3.3 American Samoa

The Territory of American Samoa has only one fishing law -- a prohibition against the "reckless use" of poisons for harvesting fish -- which could have an impact on the harvest of bottomfish. Other restrictions on fishing activity are traditional and are instituted at a village level for inshore fisheries. Village restrictions are much more effective than those imposed at higher levels of government because they are promulgated within the cultural context by traditional leaders and, consequently, are more likely to receive the approval and acceptance of the villagers. Current management efforts by village councils are not as extensive as in the past (Wass, 1980). The offshore bottomfish fishery involves the use of boats which fish far outside the areas in which village control is effective and land the catch at two or three harbors which have not traditionally been managed by village leaders.

4.5.3.4 Seamount Groundfish Preliminary Fishery Management Plan

The inclusion of the Hancock Seamounts within the FCZ in March 1977 placed management of the fishery resources there under jurisdiction of the United States. The seamount groundfish stocks were judged provisionally to be fully exploited, and regulations were implemented restricting foreign harvest to a 2,000 MT annual quota for bottom trawling or bottom longlining and to 60 vessel-days of effort. In addition, a license for each foreign vessel and complete catch reports for each trip are also required. Another requirement is the placement of a U.S. fishery observer onboard all vessels permitted to operate within the FCZ. The latter requirement allowed an onsite inspection of this fishery and the opportunity to independently gather catch data. Beginning in 1978, Japan was allotted a total yearly catch quota of 1,000 MT for all seamount groundfish species.

4.5.4 Economic Considerations

4.5.4.1 Bottomfish

The markets for fresh bottomfish in the western Pacific appear to be much the same as the markets for snapper are throughout the world -- a high-valued product with significant quality premiums. In the western Pacific, market niches exist for particular species and there are substantial price differentials among species. Hence, mixtures of bottomfish species are harvested to maximize catch values and fishing efficiency based on location and seasons. In the long-range Northwestern Hawaiian Islands fishery, the mix of bottomfish species which is harvested in a sequence is related to perishability and to the quantities which can be absorbed without flooding the Honolulu market.

Although short-run fluctuations in landings are reflected in price, island markets seem capable of long-term expansion which would increase pressure on certain species. Medium-run fluctuations are greater and indicate the kind of problems which might arise with management measures which would affect the scheduling of landings (such as annual catch quotas or seasonal closures) and could accentuate supply fluctuations. Proposals for managing Hawaii's bottomfish fishery need to consider the quality premiums for fish coming from the main Hawaiian islands as well the weak substitutability between species, especially in the case of opakapaka. (S. Pooley, draft ms., 1985).

Economic analysis of bottomfish vessels' financial data suggests that the NWHI fishery is financially risky, which only compounds the market problems. Whether a high-quality frozen product would be acceptable in Hawaii, and whether it would compete with the fresh catch or with frozen snapper imports is an important issue. At-sea freezing of the bottomfish catch would increase to an even greater extent the pressure on NWHI stocks (S. Pooley, draft ms., 1985).

Samoaan consumers have a traditional preference for small fish ($\frac{1}{2}$ to 2 pounds), and until recently, the larger, deepwater species of bottomfish were not targeted. In April 1982, the American Samoa Office of Marine Resources launched a program to stimulate the export of fresh fish to Hawaii. These efforts resulted in the air shipment of bottomfish for sale in Honolulu. Deepwater snappers (onaga, ehu) are now being targeted because they bring the best prices in Honolulu (Howell, 1983). The development of an export fishery for deepwater snappers has stimulated a greater fishing effort in the FCZ.

Guam, like American Samoa has limited marketing potential for deepwater bottomfish. This has prompted numerous export attempts. Although exports of whole fish during 1981 amounted to less than one metric ton (Myers, et al., 1983), there is a trend toward greater export of bottomfish from Guam. (M. Pohl, pers. comm., 1985).

A large market demand for one species (onaga) exists in Japan, but it will be difficult for Guam fishermen to supply the large quantities of onaga sought by Japanese importers. There may also be opportunities to substitute local bottomfish for fish presently imported by Guam hotels and restaurants which serve the large population of tourists from Japan.

4.5.4.2 Seamount Groundfish

Due to its small size, the pelagic armorhead does not seem to have much market potential in Hawaii. Larger species which inhabit the seamount slopes probably have greater promise as potential targets of a domestic hook-and-line fishery (Yamamoto, 1983). Most of these species are considered "incidental" in the Preliminary Fishery Management Plan (PMP). It has not been determined if the harvest of incidental species in the foreign trawl fishery is adversely affecting stocks of potential importance to a domestic hook-and-line fishery or if a domestic fishery for the seamount slope resources is economically feasible.

4.5.5 Enforcement Capabilities

The capabilities of the National Marine Fisheries Service, and the U.S. Coast Guard to patrol and enforce fishery regulations in the vast ocean area of the FCZ around the American-flag islands of the western Pacific are limited. The U.S. Coast Guard in the western Pacific has two high endurance cutters, two buoy tenders, three patrol boats, three C-130 aircrafts, and two helicopters available in Hawaii, and one buoy tender and one patrol boat to patrol Guam and the CNMI. Ships and planes are subject to frequent redeployment to other areas (e.g., Alaska) to address serious problems as they arise. These carriers are used for a variety of enforcement programs as well as for search and rescue efforts. The existing at-sea enforcement capability is allocated almost entirely to foreign fishing violations of the MFCMA. Management alternatives are practically limited to measures which can be enforced at dockside. The limitations of enforcement capabilities and budgets are a major consideration in evaluating the management alternatives for the western Pacific bottomfish fisheries.

4.5.6 Biological Information Available to Guide Management

Despite their importance in western Pacific fisheries, the life history of bottomfish and seamount groundfish species is not well known, and management is subject to the familiar limitations of data inadequacy. There is a particular lack of information on recruitment and the early development stages of deepsea bottomfish and groundfish populations.

The eggs and larvae of deepsea bottomfish are pelagic, but there are no good quantitative data on the distribution of deepsea bottomfish larvae around oceanic islands. From incidental catches in Hawaii, they seem to be more common in offshore rather than inshore environments (Leis, 1982). Based on the larger size upon settlement of deepwater snapper larvae, it seems possible that duration of the pelagic period is longer for Pristipomoides spp. than for Lutjanus spp. (larvae of the latter group may drift 25 to 50 days before settling out on the bottom) (J.M. Leis, draft ms., 1985). One investigator has inferred that juveniles of Pristipomoides may lead an extended planktonic life until settlement in the adult habitat (Mizenko, 1984). At this stage in larval fish studies, investigators are establishing where the early life history is spent and are beginning to approach the question of whether locally-spawned larvae are transported great distances by currents or are retained in an eddy-like circulation near the sites of spawning (J.M. Leis, draft ms., 1985).

A review of the reproductive pattern of extended spawning by island bottomfish populations strongly indicates peak activity in the late spring and summer (C.B. Grimes, draft ms., 1985), presumably to

compensate for low levels of recruitment. There is support in the literature (Lambert and Ware, 1983) for the view that demersal spawners produce batches of larvae over an extended period to enhance the chances of survival in ocean environments of relatively low biological production and intense predation (C.B. Grimes, draft ms., 1985).

Bottomfish species currently requiring management attention in the western Pacific have life history patterns that encourage over-exploitation. They have such low rates of production and relatively high unexploited standing stocks that fisheries can develop and mature relying almost entirely on the standing stock as opposed to surplus production. These resources may be ultimately harvested down to levels at which a fishery is no longer economically feasible without prolonged recovery periods to rebuild stocks. Some of the bottomfish stocks are so available to modern gear that they can be rapidly depleted before conclusive statistical evidence can be developed. Fisheries that develop while fishing long-lived, low-production stocks of bottomfish may attain a harvesting potential that greatly exceeds the long-term productive capacity of the resources.

4.5.7 Sources of Data

4.5.7.1 Data on Domestic Fisheries

4.5.7.1.1 Hawaii

The Hawaii Department of Land and Natural Resources, Division of Aquatic Resources is the major source of fisheries data for Hawaii. Aggregate statewide data on reported commercial landings of the bottomfish management unit species and ex-vessel sale revenues for 1948-1984 are available.

The NMFS National Marine Recreational Fishing Statistical Survey (MRFSS) collected sample data on marine recreational fishing in 1979-1981 in Hawaii, and estimates of recreational bottomfish catches are available for those years.

The Western Pacific Regional Fishery Management Council monitors ex-vessel sales of bottomfish. Data on management unit species is available from January 1984 to the present. The monitoring program provides current information on the NWHI fishery and a substantial portion of the main Hawaiian island fishery for use and analysis by the Bottomfish Monitoring Team.

4.5.7.1.2 Guam

The Guam Division of Aquatic and Wildlife Resources, utilizing intercept creel surveys and through agreements with several fish wholesalers, collects bottomfish catch data. The Western Pacific Fishery Information Network (WPACFIN) has the compiled data from 1977 through 1984 available to its users.

The recreational catch estimates are available from the MRFSS for the years 1979-1981. A study of non-commercial fish production and distribution on Guam was funded in 1984 by the Council.

4.5.7.1.3 American Samoa

The Office of Marine Resources has collected commercial fishery data since 1976. WPACFIN estimates of commercial landings are available for 1981-1984. The data represents a sample of the commercial fishery in American Samoa and not a census of landings. Data such as area, method, weight, value, and price per pound by species (or species group) are included.

Estimates of the recreational catch are available from the MRFSS for the years 1979-1981.

4.5.7.2 Data on Foreign Fisheries

4.5.7.2.1 Hawaii

Data on Russian catches made before the Seamount Groundfish PMP became effective were reported by Sakiura (1972) and Borets (1975). Subsequent Russian data are not available, but Sasaki (1984) provides recent Japanese catch data for the overall fishery.

The catch per unit effort (CPUE) of pelagic armorhead for all major seamounts fished by the Japanese from 1969-1976 are given by Takahashi and Sasaki (1977).

The U.S. observer and catch reporting requirements imposed on foreign fishermen under the Seamount Groundfish PMP have yielded data on catch, effort, species composition, fishing area, size composition, and product forms. The foreign vessel observer reports are available through the SWFC Honolulu Laboratory.

The SWFC Honolulu Laboratory, has conducted research surveys at various seamounts in the FCZ (Gooding 1980, Uchida and Tagami, 1985).

An international workshop on the Environment and Resources of the Seamounts in the North Pacific held in March of 1984 in Shimizu, Japan consolidated the latest information on the many aspects of the seamounts and their associated resources.

4.5.7.3 Biological Data Sources

Ralston (1979) published the first review of the western Pacific bottomfish fisheries. Descriptions of the fisheries and the biology of the targeted species are included. Ralston later expanded on the biology of opakapaka in his Ph.D. dissertation (Ralston, 1981).

Ralston (1981) and Ralston and Polovina (1982) provide the preliminary estimates of the MSY for the Hawaiian archipelago. Preliminary MSY estimates for islands of the Mariana Archipelago are found in Polovina, et al. (1985).

The Proceedings of the First Symposium on the Resource Investigations in the NWHI in April of 1980 present information collected on the biology, trophic relationships, distribution and abundance of many of the management unit species.

The Proceedings of the Second Symposium on Resource Investigations in the NWHI in May of 1983 present additional biological information, as well as an assessment of commercial feasibility of the NWHI bottomfish fishery.

The Workshop on the Biology of Tropical Groupers and Snappers sponsored by the Honolulu Laboratory in May 1985 provides current information on the biology, systematics, assessments, distribution, and marketing of various snapper and groupers. The collection of papers are an excellent synopsis on the available information and their sources.

4.5.7.4 --- Research

One of the major investigations that has yielded important information on the biology and assessment of the bottomfish management unit species was a 5-year survey and assessment of the marine resources of the NWHI by the NMFS Honolulu Laboratory, the Hawaii Division of Aquatic Resources, and the U.S. Fish and Wildlife Service. This research provided much of the basic biological information that was previously lacking for many Hawaiian bottomfish species.

The NMFS Honolulu Laboratory's Research Assessment Investigation of the Marianas Archipelago (RAIOMA) program has yielded a wealth of biological data on the bottomfish resources of the Marianas Archipelago. The latest information was presented in Guam and Saipan in May 1985.

5.0 MANAGEMENT UNIT AND MANAGEMENT ISSUES

5.1 Management Unit (Affected Species)

The bottomfish and seamount groundfish fisheries comprise a large number of species, only a few of which seem to be in danger of overfishing at present. The administrative burden and cost of FMP preparation can be reduced through development of a single, comprehensive plan to manage these species as a unit throughout their range rather than creating a separate management plan for each species.

5.1.1 Included Bottomfish Species

The bottomfish complex consists of bottom-associated species which generally occupy the same type of deep-water habitat and are caught by the same fishing methods offshore of American Samoa, Guam, and Hawaii. This complex includes at least 65 species of 4 families: snappers (Lutjanidae), groupers (Serranidae), jacks (Carangidae), and emperorfishes (Lethrinidae). About 20 of these species are landed in substantial quantities.

Although most of the same species occur in Hawaii, American Samoa, and Guam, the stocks in these island areas are reproductively isolated. Available data do not allow a clear separation of stocks within each island area. A study of opakapaka (Pristipomoides filamentosus) (Shaklee and Samollow, 1984) could not provide evidence of genetically-distinct groups of this species in the Hawaiian islands. Although some interchange between geographically separate banks occurs through recruitment of larval fish, deep channels between islands and banks are probably effective barriers to the dispersal of post-larval bottomfish.

The existence of geographically isolated stocks of bottomfish, as well as the geographic variation in species composition, socio-economic conditions, and existing condition of stocks requires separate management regimes for the sub-areas of the FCZ around American Samoa, Guam, the main Hawaiian Islands, the Northwestern Hawaiian Islands, and the Hancock Seamounts.

Although the bottomfish fishery is operationally a mixed-species fishery and fisheries development activities are directed at the bottomfish complex as a whole, multi-species and ecosystem interactions cannot be taken into account at this time because of a lack of biological and economic information and a lack of pertinent multi-species assessment models.

Targeting is an important concept in defining the management unit. A bottomfish species is a target if it can be caught without a significant catch of incidental species. The ability to target may vary widely depending on the skill of each captain. Initially, the species included in the management unit are those which are being actively targeted by fishermen in the FCZ. This may have to be modified in the future by the Council if there are shifts in the species which are targeted. Species which are harvested incidentally to target species are treated as non-specified species for the purpose of this plan. Existing data collection activities are adequate to indicate if any non-specified species needs to be reclassified in the future as a management unit species.

The bottomfish species included in the management unit are listed in Table 5.1, together with information concerning their presence and relative abundance in each island area, their usual depth of capture and the usual size harvested.

5.1.2 Excluded Bottomfish Species

Fish species which are members of the reef fish complex and which are captured primarily with inshore fishing gear (pole-and-line, spear, surface gillnet, seine net, cast net) are excluded from the management unit. Although caught in shallow waters with hook-and-line gear, goatfishes (weke), squirrelfishes (menpachi), certain hogfishes (a'awa) and certain scorpionfishes (nohu) are also excluded from the management unit because their inshore distribution is more closely associated with the reef fish complex than with the deepsea bottomfish complex. Also excluded from the management unit are coastal pelagic species, such as bigeye scad (akule) and mackerel scad (opelu), which are regularly taken with shallow handline gear. Deepsea handline fishing methods do not produce significant quantities of these species. Although excluded on biological grounds, both sets of species may compete with deepsea bottomfish at the market level and thus may be indirectly affected by the FMP.

5.1.3 Included Seamount Groundfish Species

The seamount groundfish complex is comprised of several species which dwell at depths (150-300 fathoms) on the submarine slopes and summits of seamounts below the depth range and at higher latitudes than are generally inhabited by the snapper-grouper-jack-emperorfish assemblage. The pelagic armorhead (Pseudopentaceros wheeleri) is the primary target species of a foreign trawl fishery conducted in the Emperor Seamount range. Catches of alfonsin (Beryx splendens) were incidental in the trawl fishery but have increased in importance as the armorhead catch

declined in recent years. Another seamount groundfish species which may have commercial potential is the butterflyfish Hyperoglyphe japonica (medai).

The seamount groundfish complex includes a large number of incidental species of uncertain or little commercial value which are not specified as management unit species in Table 5.2.

TABLE 3.1 BUTTOWFISH SPECIES INITIALLY INCLUDED IN THE MANAGEMENT UNIT

FAMILY	SPECIES	POPULAR NAMES	DISTRIBUTION ^a	RANGE OF DEPTH USUALLY CAUGHT (fm)	WEIGHT OF INDIVIDUAL FISH USUALLY CAUGHT (lbs.)
Lutjanidae	<i>Abercrombium ruber</i> (silver jaw jobfish)	lehi (H), palu-gutalliva (S)	G, H, S	90 - 150	6 - 18
	<i>Apogon niger</i> (gray jobfish)	uku (H), asoama (S)	G, H, S	15 - 60	4 - 18
	<i>Etelis carbunculus</i> (equifish snapper)	ehu (H), palu-malau (S)	G, H, S	110 - 180	1 - 5 (to 45 in American Samoa)
	<i>Etelis coruscans</i> (longtail snapper)	onaga, ula'ula (H), palu-foa (S)	G, H, S	100 - 150	4 - 18
	<i>Lutjanus kasmira</i> (blue stripe snapper)	ta'ape (H), savane (S), funai (G)	G, H, S	20 - 60	1
	<i>Pristigaster auricilla</i> (yellowtail snapper)	palu-i'usana (S), yellowtail kalekale (G)	G, H, S	100 - 150	1 - 2
	<i>Pristigaster filamentosus</i> (pink snapper)	opakapaka (H), palu-'ena'ena (S), galeo (G)	G, H, S	30 - 110	2 - 18
	<i>Pristigaster flavipinnus</i> (yelloweye snapper)	palu-sina (S), yelloweye opakapaka (G)	G, H, S	90 - 150	1 - 4
	<i>Pristigaster meleoides</i> (snapper)	kalekale (H)	G, H	80 - 150	1 - 3
	<i>Pristigaster zonatus</i> (snapper)	gindai, palu-naga (S)	G, H, S	70 - 120	1 - 5

Table 5.1 Bottomfish Species Initially Included in the Management Unit (Page 2)

FAMILY	SPECIES	POPULAR NAMES	DISTRIBUTION*	RANGE OF DEPTH USUALLY CAUGHT (m)	WEIGHT OF INDIVIDUAL FISH USUALLY CAUGHT (lbs.)
Carangidae (jacks)	<u>Caranx ignobilis</u> (Giant trevally)	white ulua (H), tarakito (G), aspo'anee (S)	G, H, S	20 - 65	10 - 40
	<u>Caranx lugubris</u> (black jack)	black ulua (H), tarakito (G) tafauli (S)	G ^o , h, S	15 - 100	3 - 15
	<u>Pseudocaranx dentex</u> (thick-lipped trevally)	pig ulua, butaguchi (H)	H	40 - 100	2 - 40
	<u>Seriola lalandi</u> (amberjack)	kahala (H)	G, H ^o , s	40 - 130	8 - 30
	<u>Epinephelus fasciatus</u> (blacktip grouper)	fausi (S), gatau (G)	G, S	10 - 90	1 - 2
Serranidae (groupers)	<u>Epinephelus guernus</u> (sea bass)	hapu'upu'u (H)	H	50 - 150	6 - 22
	<u>Varigla louti</u> (liontail grouper)	papa (S)	G, S	30 - 90	1 - 5
Lethrinidae (emperorfishes)	<u>Lethrinus amboinensis</u> (ambon emperor)	filoa-gutunumu (S)	S	20 - 60	1 - 4
	<u>Lethrinus rubrioperculatus</u> (redgill emperor)	filoa-pa'o'omumu (S), safuli (G)	G, S	15 - 100	1 - 2

Notes: G = Guam
S = American Samoa
H = Hawaii

* Capital letters indicate that species is relatively common in bottomfish catches.
Lower case indicates that species is uncommon.

** Marketability is reduced because of the risk of ciguatera.

TABLE 5.2 SEAMOUNT GROUND FISH SPECIES INCLUDED IN THE MANAGEMENT UNIT

<u>FAMILY</u>	<u>SPECIES</u>	<u>POPULAR NAMES</u>	<u>DISTRIBUTION*</u>	<u>RANGE OF DEPTH USUALLY CAUGHT (fm)</u>	<u>WEIGHT OF INDIVIDUAL FISH USUALLY CAUGHT (lbs.)</u>
Pentacerotidae (armorheads)	<u>Pseudopentaceros wheeleri</u> (armorhead)	kusakari tsubodai (J)	SE-NHR	125 - 300 +	0.5 - 2.5
Berycidae (alfonsins)	<u>Beryx splendens</u> (alfonsin)	kinmedai (J)	SE-NHR	150 - 300 +	2 - 4 (hook-and-line)
Centrolophidae (raftfishes)	<u>Hyperoglyphe japonica</u> (butterfish)	medai (J)	se-nhr	175 - 200 +	5 - 20 (hook-and-line)

Notes: J = Japan

"

* Capital letters indicate that species is relatively common in groundfish catches.
Lower case indicates that species is uncommon.

SE-NHR = Southern Emperor -
Northern Hawaiian Ridge Seamounts

5.2 Management Unit (Affected Fishery)

5.2.1 Production

Participants in domestic bottomfish fisheries are of four general types:

- * Vessel operators who are part-time or casual fishermen. This fishery, which usually blends recreational, commercial, and subsistence purposes, occurs in American Samoa, Guam, and the main Hawaiian Islands. This category of bottom-fishing usually involves small, trailerable boats 16 to 25 feet in length.
- * Multi-species, mixed-gear commercial fishing vessels which shift from species group to species group or from fishery to fishery in response to seasonal fish abundance or fluctuations in price. Although bottomfishing is not the only activity of these boats, it may be vital to year-round operations. This fishery occurs in all areas. In Hawaii, this group includes longtime local commercial and charterboat fishermen and, more recently, longline fishermen, as well as former albacore trollers who have relocated from the Pacific west coast. The vessels usually range in size from 35 to 55 feet in length.
- * Commercial handline vessels which specialize in harvesting bottomfishes. This fishery occurs primarily in the Northwestern Hawaiian Islands and main Hawaiian Islands, but there are a few such fishermen in American Samoa and Guam. Vessels range in size from 35 to 65 feet in length. In the NWHI fishery nearly 50% of the 1984 mixed-species bottomfish catch was harvested by 15% of the participating vessels.
- * In addition, small catches of management unit species are made incidentally in the Northwestern Hawaiian Islands' commercial lobster trap fishery. There are about 15 active catcher/processor boats in the lobster fishery.

Table 5.3 presents estimates of the number of domestic fishermen according to level of participation.

TABLE 5.3
NUMBER OF DOMESTIC FISHING VESSELS IN THE BOTTOMFISH FISHERY 1984-85,
BY ISLAND AREA AND LEVEL OF PARTICIPATION

Island Area	Level of Participation		
	Full-Time Single-Purpose (Bottomfish)	Multi-Purpose With Primary Emphasis on Bottomfish	Multi-Purpose With Secondary Emphasis on Bottomfish
American Samoa	2	40	
Guam	2		
Main Hawaii Islands	20 $\frac{1}{1}$	400 $\frac{2}{1}$	900 $\frac{2}{1}$
Northwestern Hawaiian Islands	12 $\frac{1}{1}$	6 $\frac{1}{1}$	15 $\frac{1}{1}$

1/ WPFMC, unpubl. data from ex-vessel monitoring

2/ Estimated from data reported in Skillman and Louis (1984)

The majority of the participants in the Hawaii fishery are part-timers, fishing fewer than 50 days during the year, and engaged in other fisheries as well. The bottomfish fishery is attractive to part-time fishermen because of the low initial investment, low operating costs, and the high potential returns (HDLNR, draft report).

There is no legal foreign fishery in the FCZ for species of the bottomfish complex, although some illegal bottomfishing by foreign tuna pole-and-line vessels may be occurring surreptitiously, according to domestic fishermen who frequent the NWHI.

Experienced domestic harvestors in all island areas have the capability to target particular bottomfish species with little incidental catch. Fishermen take into account the species which are available, the bottom types, depths, and seasons when they are available, their vessel's holding capacities, the prices for which the catch can be sold, the expected catch rates for their vessels at specific grounds, and the expected landings by other vessels. Integrating all this information, a vessel captain, whether a commercial fisherman or part-time fisherman, will decide to go to the grounds and fish for the species whose sale would provide the highest net profit or offset the greatest percentage of vessel operating costs.

Vertical hook-and-line remains the most efficient gear in the bottomfish fishery. However, in areas where bottomfish populations are substantially reduced, traps may prove to be a more efficient gear-type. Two of the boats in the NWHI fleet are equipped for bottom longlining, which may prove effective for aggressive-biting species, like hapu'upu'u.

Trawl gear and bottom-set nets have been used experimentally by several fishermen but due to inexperience and the rugged bottomfish habitat, all use of these gear-types has been voluntarily stopped. Prohibiting these gear-types at this time would not cause economic harm or any dislocation from a loss of catch by these gear-types. If experimentation with these gear-types is desired, an Experimental Fishing Permit (EFP) may be applied for under this plan.

No U.S. fishermen have yet harvested seamount groundfish on a commercial basis, although exploration surveys have occurred. Japanese trawlers are the principal harvesters of the FCZ seamount groundfish stocks. The number of Japanese trawlers that fished at Hancock was one each in 1978 and 1979, two each in 1980 and 1981, and three during 1982 (Humphreys, et al., 1984). In 1983-84, only one trawler fished the Hancock Seamounts.

5.2.2 Marketing and Consumption

5.2.2.1 Hawaii

Nine major bottomfish species which are components of Hawaii's fresh seafood market. The number of reef fish species is even greater, although their market is smaller. Market demand for some bottomfish (especially opakapaka for "up-scale" restaurants) has grown substantially and a separate market (household retail) for small-sized fish continues to grow. The market doubled in size, reaching 2½ - 3 million pounds (1.1 - 1.4 million kg) in 1984 (S. Pooley, draft ms., 1985).

From the production side, the bottomfish market is served by two types of Hawaii-based commercial fishing vessels, as well as by import brokerage. The large-scale modern vessels which frequent the NWHI have the capacity to flood the fresh market (landing over 10,000 lbs., 4,530 kg) at the conclusion of their two-three week trips. They have not developed an effective market for frozen products and this limits not only their catch total but their fishing range (Hau, 1984).

The main Hawaiian Islands (MHI) are the site of a mixed commercial and part-time fishery of relatively small vessels. Their catches fill the rest of the bottom and reef fish niches. The main Hawaiian island vessels are frequently operated on extra-economic characteristics and are faced with substantial resource pressure. Both the NWHI and the MHI vessels compete in the same fresh fish market which revolves around an auction in Honolulu although a sizeable market channel exists outside the auction. Fresh bottomfish is also imported on occasion from American Samoa, Guam, Palau, and Fiji. Size composition tends to allocate the larger sized fish of the NWHI catch to restaurants and the smaller sized fish to the household market (Pooley, draft ms., 1985). This competition between large and small scale vessels, each representing small business enterprises, has increased pressure for government regulation, including limited entry (Pooley, 1985a).

The retail market for fresh or fresh/frozen bottomfish and reef fish is estimated at 6 million pounds (2.7 million kg) valued at \$13.7 million, which represents approximately 11% of the total retail value of seafood sold in Hawaii. Frozen snapper imports (mainland United States and foreign) are estimated at 1.8 million pounds (815,000 kg) with a wholesale value of \$2.5 million. (Data from an unpublished 1981/1982 NMFS survey and Higuchi and Pooley, 1985a).

The Hawaii market includes a particular cultural interest in red snappers for ceremonial occasions such as New Year's. This cultural demand also includes non-seasonal events such as weddings and birthdays. Favored fish in this category include the onaga, Etelis coruscans, and ehu, E. carbunculus. The regular household component can be served by small bottom and reef fish, by fillets of larger bottomfish, and by frozen snapper imported from the mainland United States and New Zealand. Although consumer substitution between product forms occurs, frozen product is considered an inferior alternative for local bottomfish consumers. The price differential is substantial. In 1981, frozen snapper from New Zealand was entering Hawaii as fillets at \$1.40 per pound (\$3.08/kg). During that year, the average price for whole locally-produced bottomfish was \$2.30 per pound (\$5.06/kg) and for opakapaka alone it was \$2.80 per pound (\$6.16/kg) (Pooley, draft ms., 1985). Table 5.4 shows recent trends in the ex-vessel price of the Hawaii mixed-species bottomfish catch.

TABLE 5.4

RECENT TRENDS IN EX-VESSEL PRICE
FOR HAWAII MIXED-SPECIES BOTTOMFISH CATCH

Year	Price Per Pound (Whole Fish)
1978	\$1.70 ^{1/}
1979	1.83 ^{T/}
1980	1.74 ^{T/}
1981	2.35 ^{T/}
1982	2.34 ^{T/}
1983	2.62 ^{T/}
1984	2.65 (MHI) ^{2/}
	2.25 (NWHI) ^{2/}

Source: ^{1/} Hawaii Division of Aquatic Resources, annual statistical catch summaries.

^{2/} WPRFMC, unpublished data from daily ex-vessel monitoring.

Examination of market data for 1976-77 shows almost no cross-effects with other types of fresh seafood in Hawaii; e.g., tuna, mahimahi, and ono (Higuchi and Pooley, 1985a). The implication is that substitutions exist to a certain degree within the bottomfish grouping as a whole, in that landings of one species affect the price of other species. However, landings in the rest of the fishery seem to have no particular influence in the short-term price formation for bottomfish, which contributes to the idea that their demand is relatively independent. A strong negative relationship exists between local landings of tuna both ahi (yellowfin, bigeye, and albacore tunas) and aku (skipjack tuna) and the price of bottomfish.

Another question important to Hawaii's commercial fishery is the extent to which market price is determined by landings from the two main harvesting areas. The strongest correlation with overall market price is with NWHI landings, which is not surprising since they provide larger fluctuations in volume. Because landings from the MHI are considered of higher quality, their volume appears to determine their own price level, independent of NWHI landings. Of course they also have a different species composition (S. Pooley, draft ms., 1985).

Available data suggest that the strongest long-term impact on the price for bottomfish is the growth of Hawaii's de facto population (both resident and tourist).

Although prices for fresh fish in Hawaii track together a certain extent, the relationship is weaker than one might expect. Over the long-term, the price of bottomfish rose more rapidly than the price of all fresh fish (except skipjack which increasingly shifted from the cannery to the fresh market) in Hawaii. The non-skipjack prices rose at an annual rate of 1.5%, of which bottomfish rose by 3.1%, after inflation. Opakapaka prices increased more than onaga/ehu prices during the 1965-1982 period. This suggests the importance of the restaurant market, compared to the traditional home market, for growth in the demand for fresh bottomfish (Pooley, draft ms., 1985).

5.2.2.2 Guam

The bottomfish catches of the numerous weekend small-boat fishermen on Guam are typically either sold to offset the cost of operation, consumed personally, or given to family and friends. The two full-time commercial bottomfishing vessels sell their catch to a Guam fish dealer. The average 1983 ex-vessel prices for deepwater bottomfish ranged from \$1.32 - \$2.41 per pound with an average of \$1.89 per pound (\$4.16/kg) (WPACFIN, unpublished data).

Although the local bottomfish fishery produced 40,000 pounds in 1983, Guam relies heavily on imports to satisfy local consumer demand for bottomfish. Fresh whole bottomfish imported to Guam from the Philippines during 1981 totaled 70.9 mt (78 st), compared to only 5.9 tons of local production. Philippine imports account for a major share of seafood purchases among certain subpopulations (Myers, et al., 1983).

An estimated 73% of the fresh whole bottomfish imported from the Philippines are species which occur or have market equivalents potentially available in Guam waters. Local consumption patterns offer possibilities for import substitution with locally-caught bottomfish, the prices received by local fishermen will be controlled at the lower price levels of imports. Guam fishermen probably will not realize higher prices unless export markets can be developed for local bottomfish (Myers, et al., 1983).

5.2.2.3 American Samoa

Samoan consumers have a traditional preference for small fish ($\frac{1}{2}$ - 2 pounds). Most of the bottomfish species harvested in the shallow-water handline fishery are in the preferred size range and are marketed as whole, chilled fish.

Fishermen sell their bottomfish catch directly to the public at the Fagatogo market, for average prices of \$1.75/lb., or sell to the retail markets and restaurants, for average prices of \$1.25/lb.

Retail markets refuse bottomfish larger than about 12 inches total length. A few restaurants buy large snappers, as do the U.S. purse seiners which frequent Pago Pago Harbor. Otherwise, fish over 5 pounds are difficult to market in Samoa.

In addressing the problem of low local demand for large bottomfish, in May 1982 Samoan fishermen started exporting large snappers to the Hawaii market, where onaga and ehu are particularly in demand. The prices received in this export trade, after deducting packing and shipping expenses and auction commissions, initially averaged about \$2.10/lb. (Wass and Aitaoto, 1983). The establishment of the air-shipped bottomfish trade to Hawaii has had a dramatic impact on the small-boat fishing fleet in Samoa. Fishermen sort their catch according to market, directing deepwater snappers, such as onaga, ehu, and lehi (all of which may reach 20 pounds or more in American Samoa), to the export market and selling the small fish locally. Fresh fish exports to Hawaii increased from about 3,200 pounds in 1982 to nearly 7,000 pounds in 1984. The average export price (ex-vessel) for onaga and ehu, the primary species exported, were \$3.81 and \$2.36, respectively, in 1982, \$4.53 and \$2.65, respectively in 1983, and \$4.15 and \$2.55, respectively, in 1984 (WPACFIN, unpublished data).

On a whole, the Samoan bottomfish now enjoy a reputation of good quality and freshness and the prices are steadily trending upwards. This could well provide a good income to the nucleus of professional fishermen in American Samoa for the foreseeable future, provided that the deepwater stocks are not overfished (Howell, 1983).

5.2.2.4 Seamount Groundfish

To test Hawaii market reaction, approximately 240 kg (528.0 lbs.) of groundfish captured at the seamounts during a research cruise of the R/V Townsend Cromwell were frozen onboard for sale through the Honolulu fish auction in July 1983. The akodai-like Hozukius sp. received the highest prices, ranging from \$0.55 to \$1.25/lb. Alfonsin received \$0.55/lb., pelagic armorhead also received \$0.55/lb., and medai received from \$0.25 to \$0.50/lb. (Seki and Tagami, 1984). By contrast, the 1982 ex-vessel value (in U.S. dollars) landed in Japan was \$0.35/lb. (dressed) for pelagic armorhead and \$0.11/lb. (whole) for alfonsin (Humphreys, et al., 1984).

5.3 History of Exploitation

Historical data on Pacific island fisheries are scant compared to that for the continental fisheries of the U.S. Commercial exploitation of bottomfish in Hawaii began before the twentieth century (Cobb, 1903). In American Samoa and Guam, fisheries for deepsea bottomfish are a much more recent development and are smaller in scale (Sverdloff, 1972; Ikehara, et al., 1970).

Commercial, recreational, and subsistence fishermen land bottomfish in the FCZ primarily with vertical hook-and-line gear and to a lesser extent with bottom longlines and traps. There is considerable variation in the fishing power exerted by a small vessel lacking in fish-finding and navigational gear and hauling fish by hand compared to that exerted by a modern fiberglass boat equipped with a chromoscope, LORAN, and automated line haulers. Attempts have been made to use bottom-set gill nets and trawl nets in the western Pacific without much success to date. Species composition of hook-and-line catches varies considerably among the 3 island areas. Ralston (1979) listed the species typical of Hawaii, American Samoa, and Guam fisheries.

Ralston and Polovina (1982) reviewed historical commercial catch data for the deepsea handline fishery in Hawaii for the 1959-1980 period. Unreliable reporting makes the information difficult to interpret. The main Hawaiian Islands commercial handline fishery has experienced declines in catch per unit of effort, but not in total landings, since 1975. Landings from the Northwestern Hawaiian Islands increased dramatically in 1984-85 as a result of expanded bottomfishing by long-range boats.

The history of landings from American Samoa and Guam is less known but increasing effort for shallow-water and deepsea bottomfish is indicated. The Honolulu Laboratory Western Pacific Fishery Information Network has compiled the best available historical catch data for these areas. If a generalization can be made, it is that catches are lower from small islands with precipitous offshore slopes and increase for larger islands and banks with less precipitous offshore slopes.

The extremes of the spectrum of available habitat are the Northwestern Hawaiian Islands (1,231 nautical miles of 100-fathom isobath) and Guam (152 nmi of 100-fathom isobath).

TABLE 5.5

INDEX OF BOTTOMFISH HABITAT, BY ISLAND AREA

Island Area	Length of 100-Fathom Isobath	
	nmi	km
Guam	138	255
American Samoa	169	313
Main Hawaiian Islands	977	1,809
Northwestern Hawaiian Islands	1,231	2,280

Annual bottomfish catches in Hawaii are considerably larger than those from the territories.

TABLE 5.6

1984 COMMERCIAL MIXED-SPECIES BOTTOMFISH CATCH, BY ISLAND AREA

Island Area	Estimated 1984 Commercial Landings	
	lb.	kg
Guam	34,000 <u>1/</u>	15,454
American Samoa	87,000 <u>2/</u>	39,545
Main Hawaiian Islands	910,000 <u>3/</u>	413,636
Northwestern Hawaiian Islands	583,000 <u>4/</u>	265,000

Sources: 1/ Based on data presented in Polovina, et al. (1985).

2/ WPACFIN data for management unit and unspecified species adjusted by a factor of 1.25 to account for unreported landings.

3/ WPFMC unpublished data from daily ex-vessel monitoring 1/19/84 through 1/18/85 corrected for incomplete coverage with an adjustment factor based on surveys by NMFS Honolulu Laboratory.

4/ WPFMC unpublished data from daily ex-vessel monitoring. 1/19/84 through 12/31/84.

5.3.1 Hawaii

There is a long history of commercial fishing in the Hawaiian Islands. A fleet of vessels fished the deepwater bottomfishes throughout most of the archipelago at least as early as the 1930s. Fishing pressure was high enough that in 1925 the Territorial Legislature enacted a one-pound minimum size limit for opakapaka, ula'ula, uku, and ulua offered for sale by the fisherman or in the possession of a fish dealer. The sparse legislative reports supporting the minimum size law indicate concern about a "decreasing supply of fish". Catch records covering the period 1945 to 1982 indicate that the commercial landings for the State began at about 450 MT (495 T) after the hiatus imposed by World War II, declined rapidly to a level of about 180 MT (198 T) by 1959, remained relatively stable at around 180 MT (198 T) until 1974 when landings began steadily increasing (Polovina, draft ms., 1985). These catch data come only from fishermen with commercial fishing licenses and do not include catches from the recreational fishermen which may be substantial around the populated islands (Ralston and Polovina, 1982). An estimate of the commercial landings for the State for 1984 is 662 MT (728 T) (WPFMC, unpubl. data) which indicates that commercial landings have continued their rapid increase and are now greater than at any time since World War II.

The high catches in the period 1948 to 1953 correspond to a period when both the NWHI and main Hawaiian Islands were fished. However, by the mid-1950s most of the fishing was restricted to the main Hawaiian Islands until the late 1970s, when there was renewed interest in the stocks of the NWHI. Landings from the main Hawaiian Islands remained relatively stable from 1959 to 1978 fluctuating from 100 to 200 MT (110-220 T), but since 1978 rapid growth is indicated with an estimate for 1984 of 413.6 MT (455 T) (see Figure 5.1). In 1984, opakapaka comprised 23% of the catch and together onaga, opakapaka, uku and ulua accounted for almost 70% of the landings (Polovina, draft ms., 1985).

The rapid increase in landings both from the main Hawaiian Islands and for the entire State since 1978 is a direct result of an expansion of the local market for fresh bottomfish at a relatively stable and strong price (Higuchi and Pooley, 1985a). The 1984 wholesale prices for bottomfish averaged \$5.83/kg (\$2.65/lb.) with onaga and opakapaka commanding the highest prices at \$8.80/kg (\$4.00/lb.) and \$7.37/kg (\$3.35/lb), respectively (WPFMC, unpubl. data).

The species composition of the commercial landings from the main islands does not show any radical changes over the period 1959 to 1984 but some of the species exhibit substantial relative increases or decreases (Table 5.7). Some of these changes are readily explainable such as a decline of kahala (grouped in the "others" category) due to its implication in ciguatera poisoning, the relative increase of onaga, a

deepwater species, due to increasing fishing pressure in deeper habitat, and the corresponding relative decline of the shallower water species ulua and uku due to heavy fishing in shallow water (Polovina, draft ms., 1985).

TABLE 5.7

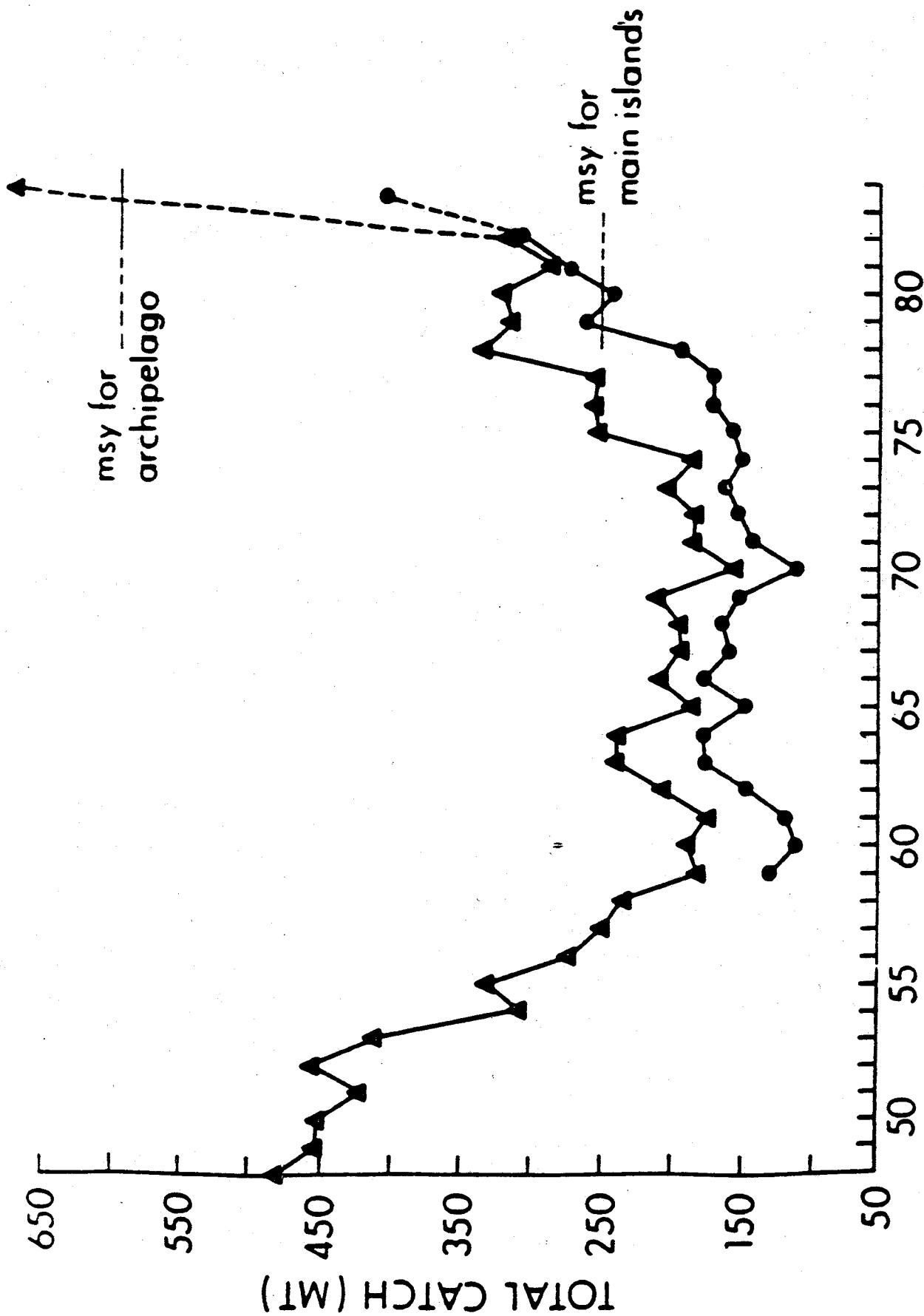
SPECIES COMPOSITION OF COMMERCIAL LANDINGS OF
DEEPWATER BOTTOMFISHES FROM THE MAIN HAWAIIAN ISLANDS
(In Metric Tons)

Species	1964	(%)	1974	(%)	1984	(%)
Ehu	9.3	(5.2)	9.4	(6.3)	16.7	(4.0)
Gindai	0.7	(0.4)	0.5	(0.3)	2.1	(0.5)
Hapuupuu	4.0	(2.3)	8.5	(5.7)	25.1	(6.1)
Kalekale	7.1	(4.0)	2.2	(1.5)	10.8	(2.6)
Lehi	0.4	(0.2)	1.9	(1.3)	7.4	(1.8)
Onaga	21.7	(12.2)	17.7	(11.8)	86.7	(21.0)
Opakapaka	42.4	(23.9)	48.7	(32.4)	96.2	(23.2)
Uku	40.1	(22.6)	35.0	(23.3)	66.4	(16.1)
Ulua	13.8	(7.8)	12.0	(8.0)	27.1	(6.6)
Others	38.0	(21.4)	14.1	(9.4)	75.0	(18.1)
TOTAL	<u>177.5</u>		<u>150.0</u>		<u>413.6</u>	

Source: Polovina, draft ms. (1985)

The first approach to yield assessment for the Hawaii mixed-species fishery was obtained by fitting a total biomass Schaefer surplus production model to the commercial catch and effort (measured in vessel days) data over the period 1959-1978 (Ralston and Polovina, 1982). The Molokai-Lanai-Kahoolawe-Maui (MLKM) bank, which accounts for over 50% of the main Hawaiian Islands' bottomfish landings, is the only bank where the total biomass Schaefer model produced statistically significant results. As a first approximation, treating the mixed-species bottomfish resource with the total biomass model is appealing because all the species occupy a very similar range of habitat, all appear to be high-level carnivores with no evidence of strong prey-predator interactions between them and fishing for one species may also exert pressure on other species (Polovina, draft ms., 1985).

The estimated maximum sustainable yield (MSY) based on the total biomass Schaefer model for the MLKM bank is 106 MT (117 T) which corresponds to a unit MSY of 272 kg/nmi (598 lbs./nmi) of 100-fathom contour (Ralston and Polovina, 1982). This estimate is a lower bound since it includes only commercial landings and not the recreational catch which could be substantial.



YEARS 1948-1984

FIGURE 5.1 THE ANNUAL COMMERCIAL LANDINGS FOR DEEPWATER BOTTOMFISHES FROM THE MAIN ISLANDS AND THE ENTIRE ARCHIPELAGO FOR 1948-1984. DATA REPORTED BY STATE OF HAWAII, DIVISION OF QUATIC RESOURCES.

▲ = Archipelago Landings. ● = Main Islands Landings.

Source: Polovina, draft ms., 1985.

The length of the 100-fathom contour for the main islands and the NWHI is 997 (1,847 km) and 1,231 (2,280 km) nmi, respectively. Based on the annual MSY estimate of 272 kg/nmi of 100-fathom contour, the MSY for the main islands is estimated at 271 MT (298 T) and that for the NWHI at 335 MT (368 T) with an archipelago total of 606 MT (667 T). Since 1979, the landings from the main islands have exceeded the estimated MSY level with the 1984 landings of 414 MT, 53% above the MSY level. Landings from the fishable range of the NWHI for 1984 exceeded the MSY level by 15%.

It is difficult to obtain an accurate measure of fishing mortality for the bottomfish resource. Over the period 1959-1978, for which a measure of effort in vessel days is available, there has been a three-fold increase in vessel days (Ralston and Polovina, 1982). However, technological changes such as electric or hydraulic gurdies, fathometers, color chromoscopes, and LORAN have increased the fishing power of the vessel day many fold so that the trend in vessel days understates the real trend in fishing mortality. In addition to the considerable increase in fishing mortality in recent years there is evidence that, at least for opakapaka in the main islands, that there has been a substantial decrease in the age of entry to the fishery between 1980 and 1984 (Ralston and Kawamoto, 1985).

When the approach used in the Guam analysis (Section 5.3.2) to compute the ratio of the spawning stock biomass under exploitation to the spawning stock biomass in the absence of exploitation is applied to opakapaka stocks in the Hawaiian Islands with an age of entry of 1.8/yr. and a fishing mortality of 0.5/yr., it is estimated that the spawning stock biomass is reduced to 10% of its unexploited level as compared to 28% of its unexploited level when the age of entry is 4 years for the same level of fishing mortality (J. Polovina, draft ms., 1985).

5.3.2 Guam

The fishery for deepsea bottomfish in Guam grew out of a program of exploratory fishing initiated in 1969 (Ikehara, et al., 1970). Historical data for this fishery are sparse prior to 1979 but do not indicate overfishing (Ralston, 1979).

Recent exploratory surveys throughout the Mariana Archipelago produced an average catch rate of deepsea bottomfish that was 93% higher at banks in the FCZ south of Guam than immediately offshore of Guam (see Table 5.8) (Polovina, et al., 1985).

TABLE 5.8

**BOTTOMFISH CATCH PER UNIT EFFORT (CPUE) AND STANDARD ERROR
FOR GUAM AND FCZ BANKS**

Area	Mean Drift CPUE (No. of Fish/Line-Hr.)	Standard Error
Guam	1.53	0.35
FCZ Banks - (Galvez and Santa Rosa Banks)	2.95	0.31

Source: Polovina, et al., 1985

The approach to yield estimation for the deepwater bottomfishes is described in detail in Polovina and Ralston (ms. in prep.). Using an estimate of catchability obtained from an intensive fishing experiment and a measure of bottomfish habitat together with the estimated relative abundance from the exploratory survey, the total bottomfish biomass which can be exploited with handline gear was computed. The Beverton and Holt (1956) yield equation, together with estimates of growth and mortality parameters obtained from otolith and size-frequency data, was used to first determine the age of entry for each of the major species which will maximize the yield per recruit. Then, with the estimate of unexploited biomass, the equilibrium yield was estimated as a function of fishing mortality. Also, the change in the spawning stock biomass relative to its level in the absence of exploitation can be computed with the Beverton and Holt yield equation as a function of fishing mortality.

The "optimum" biological equilibrium yield, not considering economic factors, has been suggested as the yield corresponding to that level of effort where an increase of one unit of effort will increase the catch by 0.1 of the amount caught by the very first unit of effort (Gulland, 1983, 1984).

The value of $F_{0.1}$ for the bottomfish resource in the Marianas is estimated to be $F = 1.0$, and the corresponding annual equilibrium yield for Guam and the banks south of Guam totals about 26 MT (see Table 5.9). At a fishing mortality of 1.0, the spawning stock biomasses for the seven major species are reduced to 20-42% of their unexploited levels (Polovina et al., 1985). Although the spawner recruit curve for these species is unknown, as a generic lower bound, the spawning stock biomass should not be reduced below 20% of its unexploited level if a serious reduction of recruitment is to be avoided (Beddington and Cooke, 1983).

The ratio of total yield for Guam and Santa Rosa and Galvez Banks to the total length of the 100-fathom contour is 164 to 202 kg/nmi (see Table 5.9) (Polovina, et al., 1985). These values suggest that the stocks in the Marianas are slightly less productive than those in Hawaii where a lower bound estimate of maximum sustainable yield of 272 kg/nmi of 100-fathom contour was obtained from a stock production model applied

to commercial catch and effort data (not including the recreational fishing component) from the deepsea handline fishery at Penguin Bank (Ralston and Polovina, 1982).

TABLE 5.9

ANNUAL EQUILIBRIUM BOTTOMFISH YIELD AND YIELD PER NAUTICAL MILE OF 100-FATHOM CONTOUR FOR THE AGE AT ENTRY WHICH MAXIMIZES THE YIELD PER RECRUIT AT A LEVEL OF FISHING MORTALITY OF $F = 1.0$

Area	Total Yield		Yield of 100-Fathom Contour	
	<u>MT/Yr.</u>	<u>T/Yr.</u>	<u>Kg/Yr.</u>	<u>Lbs./Yr.</u>
Guam	17.2	18.9	201.6	445
Galvez and Santa Rosa Banks	8.6	9.5	164.2	362
TOTAL	<u>25.8</u>	<u>28.4</u>	<u>182.9</u>	<u>403</u>

Source: Polovina, et al., 1985.

It is estimated that Guam's annual bottomfish landings have increased from 6 MT in 1980 to 20 MT in 1984 (Table 5.10). Although the location data were not always obtained for these data, it appears that 65-90% of this catch comes from around Guam and the remainder comes from Galvez Banks and Santa Rosa Reef south of Guam or areas in the Commonwealth of the Northern Marianas. Given the estimated equilibrium yield of 17.2 MT for Guam and that the CPUE around Guam is about one-half of the Mariana archipelago average (4.68 fish per-line-hour of drift fishing), it appears that Guam is already fished at its maximum sustainable yield and most probably overfished on the leeward coast. There may be an opportunity to increase the yield with more fishing effort directed toward Galvez Banks and Santa Rosa Reef, but most of the additional yield potential lies in the islands and banks to the north of Guam (Polovina, et al., 1985).

TABLE 5.10

ESTIMATES OF GUAM BOTTOMFISH LANDINGS 1980-84

Year	Deepwater Bottomfish ^{1/}	
	MT	T
1980	6	7
1981	12	13
1982	9	10
1983	11	12
1984 ^{2/}	20	22

Source: Polovina, et al. (1985)

^{1/} Based on data from the Southwest Fisheries Center Honolulu Laboratory's Western Pacific Fishery Information Network file on the Guam Division of Aquatic and Wildlife Resources offshore creel survey. Confidence interval \pm 50% of catch for bottomfish.

^{2/} Estimate expanded from data from period June-September 1984.

5.3.3 American Samoa

Data from American Samoa's fishing fleet are indicators of a trend toward increased bottomfishing effort and catch. In FY 1981, about 34% of the total recorded fishing trips by the Tutuila fleet were directed at bottomfish, which accounted for approximately 28% of the catch. In FY 1982, these values increased to 60% (of 825 trips) and 36% (of 137,000 pounds) respectively and in FY 1983, about 75% of all recorded fishing trips (589) were directed at bottomfish, which accounted for approximately 55% of the total catch (of 147,000 pounds) (Wass and Aitaoto, 1983). Only a small part of the bottomfish catch, perhaps 7,000-8,000 pounds (R. Tulafono, Director, American Samoa Office of Marine Resources, pers. comm.), is caught in the FCZ.

Supporting data are not readily available, but it appears that catch rates in 1983 were greater at depths inhabited by the deepwater snapper complex than at the shallower depths fished almost exclusively in years past. Until recent development of a fishery for deepwater snappers (onaga, ehu) which are exported to Hawaii, little effort was directed at deepwater species because of the preference of the Samoan consumer for smaller and more familiar species (Wass and Aitaoto, 1983). The fresh fish export program is more completely described in Howell (1983) and McGuire (1985). There is not yet any evidence of decreasing size frequency in the catch of the deepwater snappers which are targeted for export (WPRFMC, unpubl. data).

No direct estimates of maximum sustainable yield have been made for the American Samoa bottomfish fishery. However, the limited amount of habitat is indicative of a relatively small deepwater bottomfish resource, perhaps of an order of magnitude similar to Guam. Deepwater bottomfish landings are shown on Table 5.11.

TABLE 5.11

REPORTED LANDINGS OF DEEPWATER BOTTOMFISH
OF AMERICAN SAMOA, 1981-84

Year	Deepwater Bottomfish ^{1/}	
	MT	T
1981	12.3	13.5
1982	21.8	24.0
1983	30.3	33.4
1984	29.5 ^{2/}	32.4 ^{2/}

- ^{1/} Based on data from the Southwest Fisheries Center Honolulu Laboratory, Western Pacific Fishery Information Network file of American Samoa, Office of Marine Resources data. Confidence interval \pm 50% of catch.
- ^{2/} Reported landings are lower than estimate of total catch which was adjusted to account for unreported landings in Table 5.6.

5.3.4 Seamount Groundfish

A 2,000 metric ton (MT) optimum yield (OY) for seamount groundfish inside the U.S. Fishery Conservation Zone has been available since 1977 under a Preliminary Fishery Management Plan for Seamount Groundfish. The OY consists entirely of the total allowable level of foreign fishing (TALFF), as domestic fishing for seamount groundfish has not occurred and is not expected immediately. The available evidence indicates that groundfish resources on seamounts throughout the central North Pacific are depressed and that the resources in the Hancock Seamount area within the FCZ are severely depressed. The catch per unit of effort of pelagic armorhead at the Hancock Seamounts has declined from a high of over 80 MT/hr in 1972 to about 30 MT/hr in 1978 (Humphreys, et al., 1984) to only 0.29 MT/hr in 1984. Although only 1,000 MT has been allocated each year, the quota has never been attained. Only 72 MT was taken in 1984. It is not clear whether this decline was caused entirely by intensive exploitation of adult fish starting in 1968 and continuing into the late 1970's. (Sasaki, 1984), or whether high natural variability in recruitment has been a contributing factor (Wetherall and Yong, 1984). Regardless of the

causative factor, the present armorhead spawning stock is at a very low level and recruitment may have been negatively affected (Wetherall and Yong, 1984).

Newly-acquired Russian catch data suggest that the maximum stock size of pelagic armorhead on all seamounts in the 1969-1975 period was some 400,000 MT (Borets, 1975). It is clear that rebuilding of these stocks could ultimately lead to a renewed fishery both within and outside the FCZ. Although the Soviet data show that the original assumption (Wetherall, 1978) of equal Soviet and Japanese catches during this period was incorrect, the format of the newly acquired data does not allow a sophisticated analysis as attempted by Wetherall and Yong (1984) to be completed. Efforts by the Honolulu Laboratory are underway to acquire this needed data.

Since 1978, the dominant species in the Japanese trawl catches at most of the Emperor Seamounts has been the alfonsin, Beryx splendens, previously only a minor constituent. The catch per unit of effort for the latter species has greatly increased in all seamounts except Hancock Seamounts, suggesting either an increase in abundance of alfonsin or a switching of target species (Wetherall and Yong, 1984).

The Hancock Seamounts were never significant for the foreign hook-and-line fishery because the center of abundance of the primary target species (alfonsin) is at higher latitudes in the Emperor Seamount range. In recent years, the seamount fishing grounds have been abandoned altogether by foreign hook-and-line vessels (Seki and Tagami, 1984).

5.4 Management Issues

5.4.1 Increased Bottomfishing Effort and Associated Potential for Overfishing

Although there is no evidence from the history of the bottomfish fishery to demonstrate that the stocks are vulnerable to a sudden collapse due to recruitment overfishing, there is every indication that fishing pressure on some species, especially opakapaka, in Hawaii is at record-high levels. The previous high in annual mixed-species production was about one million pounds per year in commercial landings during the 1948-1953 period. In 1984, commercial landings from the main Hawaiian Islands and NWHI combined reached over 1.4 million pounds (WPRFMC, unpubl. data).

During the first five months of 1985, total production was about 2% ahead of the 1984 pace. The main Hawaiian Islands catch had declined by nearly 5% while the NWHI catch had risen by 14% (Table 5.12). By October of 1985, the NWHI catch had risen by 18% over the comparable 1984 period (WPRFMC, unpublished data).

TABLE 5.12

COMMERCIAL MIXED-SPECIES LANDINGS IN THE HAWAII BOTTOMFISH FISHERY

Area	Landings Through May 31 (x1,000 lbs.)	
	1984	1985
Main Hawaiian Islands	296	282
Northwestern Hawaiian Islands	187	213
TOTAL	<u>483</u>	<u>495</u>

Source: WPFMC, unpublished data.

The maximum sustainable yield for the mixed-species fishery has been estimated to be approximately 596,000 pounds per year in the MHI and 508,000 pounds per year for the portion of the NWHI (Nihoa - Northhampton Bank) which was being fished in 1984. MHI bottomfish landings in 1984 exceeded the estimated MSY level by 53%. NWHI landings exceeded the estimated MSY level by 15% in 1984. The increased pace of harvesting in 1985 indicates that the MSY level in the fishable range of the NWHI was exceeded by 33% in 1985.

One analysis (Polovina, draft ms., 1985) suggests that with the present age of entry of opakapaka into the main Hawaiian Islands' fishery, the spawning stock biomass may be reduced to 10% of its unexploited level. With fresh market prices for bottomfish continuing to rise in spite of greatly expanded production, continued increases in bottomfishing effort and catch can be expected. To address this problem, the Council has established the following objective:

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

5.4.2 Insufficient Data to Guide Long-Term Management

Sound management of the western Pacific bottomfish and seamount groundfish fisheries is hindered by the familiar limitations of limited data and the unrecognized effects of environmental and recruitment variability on the condition of stocks. In most fisheries, the data needed to make management decisions are not available unless a preconceived data gathering program has been in effect. To address this problem, the Council has established the following objective:

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

5.4.3 Transboundary (State/Federal) Distribution of the Bottomfish Fishery

The geographic focus of existing bottomfishing activity in American Samoa and Guam is the territorial sea, and the FCZ portion of the fishery receives little effort. Although the FCZ portion of the bottomfish fishery in the main Hawaiian Islands (primarily the southern tip of the Penguin Bank) is one of the more productive areas, it is not unusual for a boat to bottomfish in both the territorial sea and in the FCZ on the same trip. Hence, the boundary is not distinctive in terms of the operations of the MHI fishery. Only in the Northwestern Hawaiian Islands is it clear that bottomfishing is conducted predominantly in the FCZ.

The State and both territories have federally-approved Coastal Zone Management (CZM) Programs which call for the conservation of marine resources and require that government activities in the coastal zone be consistent with approved CZM policies and programs. CZM policy generally requires consistency of Federal and State fishing laws/regulations.

The "costs" of conflict or inconsistency in State/Federal bottomfish management programs include the potential for lengthy and expensive litigation, more complex and expensive enforcement activities, and possible duplication of data reporting burdens on fishermen.

To avoid the costs of a non-cooperative approach to the management of the transboundary bottomfish fishery, the Council has established the following management objective:

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

5.4.4 Limited Amount of Bottomfish Habitat and Possible Damage to Bottomfish Stocks or Habitat Through the Use of Destructive Harvesting Technology

The use of trawl nets to harvest bottomfish is severely restricted or precluded in most Pacific island areas because of rugged bottom relief which snags and damages the gear. In 1983, a trawler from Oregon fished for a short period at the Penguin Bank off the island of Oahu and made small catches of opakapaka (100 pounds per day). However, it was reported to have suffered considerable loss and damage to its gear and left the fishery. There are no vessels utilizing trawl or bottom-set net gear to harvest bottomfish at this time.

The bottom topography becomes smoother in some areas of the western Pacific, notably the northern part of the Northwestern Hawaiian Islands, as a consequence of older submarine geology. Prior to the requirement for foreign fishing permits in the FCZ, the Japan Marine

Fisheries Resource Research Center conducted trawling surveys in the Northwestern Hawaiian Islands. Although commercial feasibility was not demonstrated, one haul caught over 13,000 pounds of opakapaka at a bank west of Lisianski Island (JAMARC, 1973).

As long as unfavorable conditions prevail in so many of the fisheries off the North American continent, it would not be surprising for a succession of U.S. vessels to explore fisheries in the western Pacific. It is inevitable that trawl or gillnet fishing methods would be attempted by some of these vessels. Although unlikely to achieve much sustained success, trawling experiments could alter bottom relief by tending to smooth bottom irregularities. This would be detrimental to the present ecosystem (K. Sainsbury, draft ms., 1985).

Space and cover are usually the major factors governing the distribution and abundance of demersal fishes. There is substantial scientific literature which relates the abundance of bottom-dwelling fish stocks to the degree of bottom complexity or physical relief. This relationship has also been practically tested by establishing artificial reefs on "dead" level bottom areas. These structures create vertical relief and often stimulate productive fisheries for demersal species.

To deal with the use of possibly destructive harvesting technology, the Council has established the following management objective:

Objective 4: Protect bottomfish stocks and habitat from environmentally-destructive fishing activities and enhance habitat if possible.

5.4.5 Possible Imbalance in the Distribution of Benefits Among Commercial, Recreational and Subsistence Fishery Interests

In the Northwestern Hawaiian Islands, bottomfishing is the domain of full-time commercial fishermen. In American Samoa, commercial and subsistence fishermen compete for some of the same bottomfish resources, and in the main Hawaiian Islands, there has been a dramatic influx of part-time or casual fishermen into the deepsea handline fishery which was historically dominated by full-time commercial fishermen. Part-time recreational and subsistence fishermen also predominate in the Guam bottomfish fishery.

The diversity of user groups has raised questions about the equitable distribution of benefits from the harvest of bottomfish: who gets what share of the benefits? Commercial value in the fishery is more important for fishermen who depend on fishing for a significant source of personal income than for part-time fishermen who have other jobs or sources of income. The non-commercial values of the western Pacific bottomfish fishery cannot be estimated from available data. However, in other regions where non-commercial fishing values have been assessed, they have

been found to be more significant than commercial values. With ever-increasing fishing effort in the bottomfish fishery, it is important to guard against an inequitable allocation of benefits. Some have expressed the opinion that native Pacific islanders do not have equal access to the fishery as compared to other groups. However, the measures in this plan are non-discriminatory.

Therefore, the Council has established the following management objective:

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

5.4.6 Possible Disruption in the Supply or Quality of Fresh Bottomfish Available to the Domestic Market

If overharvested, bottomfish stocks will not be able to provide a continuous supply of fresh product to the domestic market. Per capita seafood consumption in Hawaii and the other western Pacific island area is at least twice the national average, and fresh fish accounts for nearly half of the total. The bottomfish species complex generates 19% of total wholesale revenues derived from seafood products in Hawaii (Cooper and Pooley, 1982).

With demand for fresh Pacific island fish escalating rapidly, any disruption in the availability of a major bottomfish species (e.g., opakapaka) would have severe consequences for consumers. It is important to realize that Hawaii consumers are willing to pay high prices for fresh bottomfish, with average wholesale prices ranging from \$3.15 to \$4.20 per pound, and with the wholesale price averaging \$4.85 per pound for onaga and \$4.25 per pound for opakapaka=(NMFS Honolulu Laboratory, unpublished data). The restaurant demand for high quality fresh bottomfish cannot always be satisfied by the production of Hawaii fishermen, and fishermen in American Samoa and Guam export a portion of their catch of deepwater snappers to the Hawaii market.

The following management objective reflects the Council's view that fishery management should not accentuate the inherent fluctuations in fresh fish supply which characterize the western Pacific bottomfish fishery:

Objective 6: Maintain consistent availability of high quality products to the domestic market.

5.4.7 Possible Overcapitalization of the Northwestern Hawaiian Islands Bottomfish Harvesting Capacity

Western Pacific bottomfish populations are slow-growing for warm water species. Although unexploited standing stocks may be high, production is low. Fisheries that develop rapidly while fishing down long-lived, low-production stocks, such as opakapaka and other species, may attain a harvesting potential that vastly exceeds the long-term productive capacity of the resource. Large boats capable of distant-water bottomfishing operations in the NWHI continue to join the Hawaii commercial fleet. Many of the fishing decisions made by the captains of these vessels are based on the performance of the top boats in the fishery. This has led to an overly-optimistic assessment of the likely future of the NWHI bottomfish fishery.

Experience in other groundfish fisheries which harvest species with similar life histories suggests that once a stock is fished down to a low level, one can expect sustained production of as little as one-fifth to one-tenth of the yield produced in the process. In the past when U.S. mainland fisheries became over-capitalized and eventually depleted resources to the point of economic extinction, the boats simply moved on to other, often less desirable, fisheries. What this portends is a significant transfer of fishing power from the NWHI to other areas of the western Pacific.

To address this problem, the Council has established the following objective:

Objective 7: Maintain a balance between harvest capacity and harvestable fishery stocks.

5.4.8 Increased Participation in the Northwestern Hawaiian Islands' Bottomfish Fishery by Fishermen Unfamiliar With That Region, With a Corresponding Increase in the Risk of Vessel Groundings, and Injury of Individual Animals Through Various Fishing Operations, i.e. Hooks and/or Fishermen and the Potential For Use of Net Gear That Would Have Adverse Impacts on Protected Marine Species

A large percentage of the boats which presently frequent the Northwestern Hawaiian Islands are involved in commercial bottomfishing. The NWHI bottomfishing fleet has increased from 5 boats in 1983 to over 20 boats in 1984-85, with the range of fishing expanding from French Frigate Shoals to the Northhampton Bank 850 nautical miles northwest of Honolulu. This expansion is increasing the possibility for adverse impacts on the area's unique wildlife (including some species which are legally defined as "endangered" or "threatened").

Characterized by unpredictable currents and weather, the remote NWHI offer little protection and almost no support services for fishing

vessels. Although the military and the Coast Guard have responded to emergencies in these waters, the only government facility near the bottomfishing grounds is a U.S. Fish and Wildlife Service base at Tern Island which has a radio and small airstrip for emergency landings. The only other refuge would be Midway, 1,100 miles from Honolulu.

The major threat is from vessel groundings and the associated impacts of fuel spills and rat introductions on the habitat and populations of the Hawaiian monk seal, green sea turtle, and other wildlife. Groundings which have already occurred, including the sinking of the Keola at French Frigate Shoals (FFS) in 1981 and the recent sinking of the Carolyn K at FFS, illustrate the hazards of operating vessels in the NWHI. The risk of groundings increases, not only with the number of boats involved in bottomfishing, but with the expanding range of the fishery into poorly-charted areas northwest of Gardner Pinnacles and by the increased participation of vessel captains who are unfamiliar with the hazardous waters of the NWHI. The risk of vessel groundings may be related to the size and general seaworthiness of the boats operating in the NWHI fishery.

The use of bottom gill nets and bottom trawls by domestic fishermen has been very limited to date, but if these fishing methods should ever develop in the NWHI, incidental mortality of monk seals or sea turtles could occur as the result of the animals becoming entangled in nets or net fragments. Documentation of the entanglement of monk seal pups in lost or discarded Japanese fishing nets indicates that this may already be a serious problem in the Northwestern Hawaiian Islands (Henderson, in press).

Lost netting that is washed inshore probably represents a greater threat to the monk seal than actively operated net gear. A large percentage of the incidents of seal entanglements observed since 1974 have involved weaned monk seal pups. These pups spend much of their time in the nearshore areas where nets and other floating debris concentrate, and they are more likely to explore objects in their environment than older animals (Henderson, in press).

No Hawaiian monk seal has ever been observed to die as a result of debris entanglement, nor has an entangled carcass ever been found (Henderson, in press), but net fragments derived from domestic bottomfishing gill netting operations would only increase the hazard to seals. Observations made by California Department of Fish and Game personnel suggest that entanglement in gill and trammel nets might be a significant cause of mortality of sea otters and other marine mammals in certain coastal areas of California.

In addition, scraps of net at sea seem to attract sea turtles, which can become hopelessly enmeshed and subsequently drown (Balazs, in press).

Monk seals at French Frigate Shoals have been observed taking fish from hooks. One monk seal has been observed with a bottomfish hook embedded in its lip. No mortality has been reported, but it can be

inferred from the observation of a hooked monk seal and a report of a Mediterranean monk seal drown in longline gear (Sergeant et al., 1978, First International Conference on the Mediterranean Monk Seal. Rodos, Greece, May 1978. 45 p.) that the potential for incidental mortality exists. Also, a more direct conflict may evolve as monk seals learn to exploit bottomfish hook-and-line gear for food and fishermen try to protect their catch from depredation. There is no mechanism to authorize an incidental take of monk seals because they are protected under the Marine Mammal Protection Act (MMPA). Also, NMFS believes that incidental mortality is likely to affect the population adversely. Fishermen should understand the potential conflicts and risks of fishing in areas where monk seals occur before entering fisheries in those areas.

To avoid increased risk to threatened or endangered marine species as a result of bottomfish vessel groundings or the use of net gear or hook-and-line practices in the NWHI, the Council has established the following management objective for that sub-area:

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

5.4.9 Depleted Seamount Groundfish Stocks

Japanese fishery statistics show that in the late 1970's, the armorhead stock on the seamounts collapsed as Japanese C.P.U.E. dropped over two orders of magnitude from its peak in 1972.

At a recent meeting on the resources of the northern Pacific seamounts held in Shimizu, Japan, papers presented by Sasaki (1984) and Wetherall and Yong (1984) documented the decline in the pelagic armorhead stocks. The current status of the armorhead stocks, as reflected in the decline in catch rates, suggests that immediate management decisions are necessary (Anon., 1984). Hence, the Council has established the following management objective for the Hancock Seamounts:

Objective 9: Restore depleted groundfish stocks and to provide the opportunity for new domestic fisheries for seamount groundfish which will displace foreign fishing.

5.4.10 The Stocks of Many, if Not Most, of the Groundfish Species Range Across the FCZ into International Waters

It is apparent that the remaining populations of pelagic armorhead inhabiting the Emperor Seamount chain are depleted and in need of management. With the exception of the Hancock Seamounts, the Emperor Seamounts are located in international waters with no management regime in effect. There is some question as to how effectively the groundfish

resources within the FCZ could be unilaterally managed. The most effective management plan might be a holistic approach requiring the involvement and cooperation of all nations participating in the seamount fishery.

Hence, the Council has established the following management objective for the FCZ portion of the seamount groundfish fishery:

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

6.0 PROPOSED ACTIONS (PREFERRED ALTERNATIVE)

The Western Pacific Fishery Management Council proposes a package of management measures for the bottomfish and seamount groundfish fisheries in the FCZ around Hawaii, American Samoa, and Guam, as follows:

Administrative framework for future regulations -- The plan proposes a "framework" for managing the bottomfish fishery in the FCZ around Hawaii, American Samoa and Guam. This framework is largely an administrative procedure which describes the processes by which the fishery will be managed and which establishes the limits and controls within which regulatory adjustments may be made. The framework procedure is illustrated in Figure 6.1 (also on Figure 2.1).

Gear restrictions -- Prohibit the use of bottom trawl and bottom-set gillnets for commercial harvest of bottomfish in the FCZ.

-- Establish a 6-year moratorium on commercial fishing in the FCZ portion of the seamount groundfish fishery to promote the recovery of depleted stocks.

-- Prohibit the use of explosives and poisons for harvesting bottomfish in the FCZ off Hawaii, Guam, and American Samoa. In the FCZ off Hawaii and Guam, this would be consistent with existing State/territory rules.

NWHI permit -- Require a Federal permit for bottomfishing in the FCZ of the Northwestern Hawaiian Islands (see Appendix A for draft permit application and attached protected species inclusions).

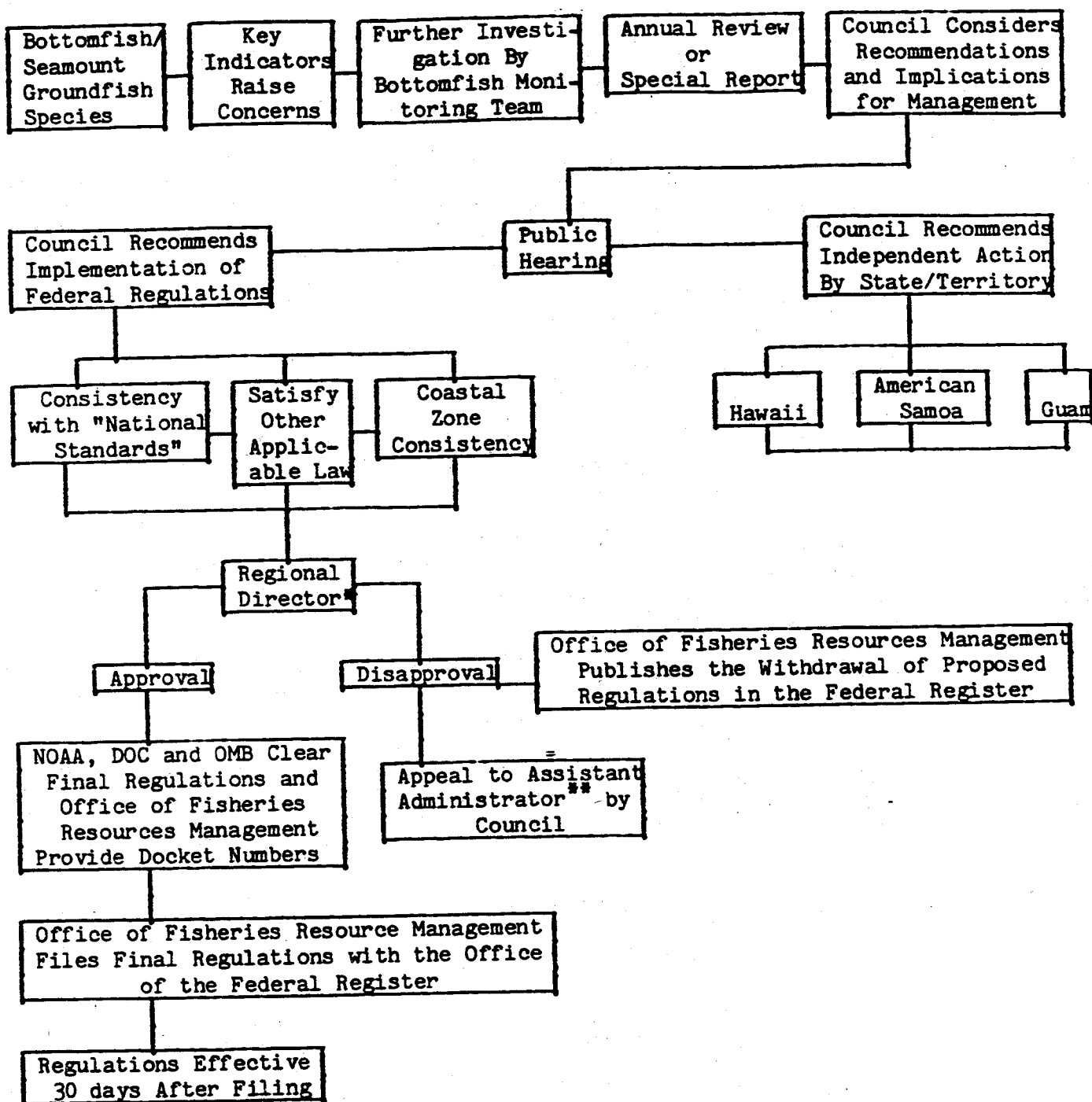
Experimental fishing permit -- To improve the data base, the Regional Director of NMFS will be authorized to issue a limited number of domestic experimental fishing permits allowing fishing which might otherwise be prohibited by regulations promulgated through the framework process.

Annual review -- A monitoring team will be appointed by the Council. The Team will prepare an annual review of fishery performance with special emphasis on further investigation of any key indicators which raise concerns.

Data collection procedures -- To obtain the catch/effort data for the annual review, reliance would be placed on existing State and Territory data reporting systems, and a Federal reporting requirement would not be added initially. The Council would consider authorizing Federal data reporting requirements in the event State/Territory systems prove inadequate.

FIGURE 6.1

ADMINISTRATIVE FRAMEWORK FOR INSTITUTING NEW CONTROLS ON BOTTOMFISHING



* Southwest Regional Director of National Marine Fisheries Service.

** Assistant Administrator for fisheries of the National Oceanographic and Atmospheric Administration.

6.1 Actions Proposed for Immediate Implementation

6.1.1 Prohibit Bottom Trawl and Bottom-Set Nets

One element of the preferred alternative is a recommendation to prohibit the use of bottom trawl and bottom-set net gear to harvest bottomfish. Current fishing practices do not include the use of bottom trawl and bottom-set net gear, therefore, this management measure would not have adverse impacts on the current fishing participants. There are several reasons for this recommendation:

-- Less Selective and Lower Quality Catch Than Hook-and-Line Fishery

Nets and traps are less selective in terms of species caught than is hook-and-line gear. Limited experience with bottom-set gill nets and bottom trawl nets in Hawaii and information from U.S. observers on Japanese trawlers fishing at the Hancock Seamounts suggest that the incidental catch is much higher in net fisheries than in the hook-and-line fishery. Furthermore, netted bottomfish are susceptible to damage which reduces the catch quality compared to the higher quality of the hook-and-line catch.

-- Overcapitalization

There is sufficient harvesting capacity in the hook-and-line fleet to harvest the entire MSY in all of the management sub-areas. The entry of bottom trawlers or gillnetters would only add unnecessary harvesting capacity and accentuate the problem of over-capitalization. Gear conflicts between gill nets and the hook-and-line fishery would be likely.

-- Habitat Degradation

Lost gill nets present a potential for ghost fishing and subsequent habitat degradation.

The effect of a bottom trawl fishery on the quality of bottom habitat off the northwest continental shelf of Australia has been examined. The trawling converted an initially irregular bottom to a smoother bottom. An alteration in species structure occurred as the character of the habitat was modified (K. Sainsbury, draft ms., 1985).

-- Net Gear/Protected Species Interaction

The use of bottom gill nets and bottom trawls by domestic fishermen has been very limited to date, but if these fishing methods should ever develop in Hawaii, incidental mortality of monk seals or sea turtles could occur as the result of the animals becoming entangled

in lost netting or net fragments. The incidence of the entanglement of monk seal pups in lost or discarded Japanese fishing nets indicates that this may already be a serious problem in the Northwestern Hawaiian Islands (Andre and Ittner, 1980; Balazs, 1979; Kenyon, 1980).

6.1.2 Moratorium on Commercial Fishing at Hancock Seamounts

A moratorium on commercial fishing is recommended for an initial period of 6 years to restore the depleted groundfish stocks, and the National Marine Fisheries Service (NMFS) has requested the Department of State to hold in reserve indefinitely the total allowable level of foreign fishing (TALFF). These decisions resulted from the inability of foreign vessels to harvest the TALFF and a continuous decline in catch per unit of effort.

Foreign hook-and-line fishing is not known to have occurred at the Hancock Seamounts since the implementation of the PMP in 1977. Recent bottom longlining operations by the Honolulu Laboratory have proven effective even when employed on a depressed stock. Due to the depressed nature of the stocks coupled with the highly limited seamount area, a large longlining operation could do a great deal of damage to the present depressed stock.

The Honolulu Laboratory of NMFS has initiated a Seamount Resources study. The total ban of all commercial fishing gears on the seamounts, as recommended by the Honolulu Laboratory, provides an opportunity for the Laboratory to assess the impact of the moratorium and to investigate the recovery of the armorhead stocks through several cycles of recruitment and to compare groundfish stocks between seamounts with and without a fishery. This study is needed to assess the sustained fishery potential of the Hancock Seamount groundfish fishery as the basis for re-establishing optimum yield. The results of this study could also be useful in guiding an international plan of action for managing the common resource across its range.

6.1.3 Prohibit the Use of Explosives and Poisons to Harvest Bottomfish in the FCZ

The State of Hawaii and Territory of Guam have existing rules prohibiting the use of explosives and poisons in fishing. Explosives and some poisons have the potential for long-lasting or irreversible damage to bottom habitat. Previous discussion has emphasized the extremely limited amount of habitat off western Pacific islands which is suitable for deepsea bottomfish. Bottomfish stocks are probably habitat-limited, and strengthening of the existing Hawaii and Guam measures by establishing complementary Federal regulations in the adjacent FCZ is therefore

proposed. To strengthen the existing American Samoa rule against poisons and to provide additional protection for limited bottomfish habitat, the use of poisons and explosives would also be prohibited in the FCZ adjacent to American Samoa.

6.1.4 Federal Permit for Bottomfishing in the FCZ of the NWHI

The Council proposes to establish a Federal permit requirement for bottomfishing in the FCZ of the Northwestern Hawaiian Islands. Each vessel owner must obtain a permit before the vessel may bottomfish in the Northwestern Hawaiian Islands. Each owner who would specify a vessel and an operator on the application (see Appendix A for draft application form). The permit will serve four purposes:

- Issuing permits to particular vessels will provide more accurate tracking of increases/decreases in fishing effort and entry/exit of fishermen in the NWHI bottomfish fishery;
- A listing of vessels with bottomfishing permits will allow more effective surveillance by Coast Guard aircraft of the vast NWHI; and
- A permit system will give the U.S. Fish and Wildlife Service and NMFS a point of contact with bottomfish fishermen and provide an opportunity for education relative to the sensitivity of the area's wildlife and the need for their protection. As a part of the permit application form an informational document which includes a protected species/fishing operation interaction or "take" form and a statement to be signed stating that the applicant has read and understands the applicable laws, regulations and penalties regarding the protected species of the area will be attached; and
- The information requested on the permit application will be considered confidential and is intended to provide information needed to assemble a general profile of the fleet's fishing power and present capabilities. The information will be invaluable in making informed rational decisions based on a full assessment of the impacts of any type of management options especially area closure or access limitation options.

6.1.5 Experimental Fishing Permit

The Council has acknowledged the paucity of data on stock sizes and yield potentials in various areas and on the economic and biological impacts of non-traditional fishing gear or techniques. The Council believes that provisions should be made to permit limited domestic experimental fishing to improve the data base for estimating yield potentials and possibly increasing the economic efficiency of domestic fishing

without adverse impacts. Impact determinations on habitat damage, protected species interactions, marketing, or other problem could be made using data from Experimental Fishing Permits with controlled testing conditions. If experimental fishing is deemed appropriate, it will be conducted under EFPs issued under Section 303(b)(1) of the MFCMA. Such EFPs could authorize the direct or incidental catch of bottomfish or seamount groundfish in the management unit which otherwise would be prohibited by this FMP. The Council proposes that the regulations implementing this FMP include a system for issuance of EFPs by the Southwest Regional Director (RD) of the NMFS consistent with the criteria and procedures to be determined by the RD in consultation with the Council. An EFP will be valid for up to one year, will be free, and will be non-transferable. The RD will consult with the Council in considering EFP applications and may limit the number, time, or area of use of EFPs to prevent overcrowding, gear conflicts, or adverse effects on fish stocks or protected species.

If the permit is granted, the RD will publish a notice in the Federal Register describing the experimental fishing to be conducted under the EFP. The RD may attach terms and conditions to the EFP consistent with the purpose of the experiment.

6.2 Framework for Regulatory Adjustments

Because of limited information about the management unit species and the uncertainty of fishing patterns in the future under this plan, the Council has concluded that a continuing monitoring and adjustment process must be built into the plan. This will provide a framework for annual or in-season adjustments in regulatory measures and strategies without requiring plan amendments if such changes are necessary to meet the objectives of the plan. This section explains the methods the Council will use to determine if such changes are necessary, the kinds of changes which may be made, and the procedure by which the Regional Director may implement changes under this framework plan.

In the event of an emergency which does not allow for timely management response under the framework procedure, the Council will still have the option of recommending that the Secretary of Commerce take emergency action, effective for a period of 90 days (with a possible 90 day extension) to manage the fishery while framework measures were being adopted and implemented.

The Council may in the future decide to put into effect a rule-related notice system. The FMP and implementing regulations must specifically provide that such a management adjustment will be accomplished by a rule-related notice and specify the procedures by which it will be accomplished. A rule-related notice applies to actions that have been anticipated in an FMP and implementing regulations. Provided the FMP contains adequate instructions, the RD is clearly implementing the FMP (a Secretarial function) rather than amending it (a Council function requiring subsequent Secretarial review). Therefore OMB will have already reviewed and approved the regulations implementing the FMP, rule-related

notices are exempt from OMB review. OMB has granted the Department this exemption on a year-by-year basis. To qualify for the exemption, a determination must be made for each management adjustment that it is, in fact, within the scope of the original framework regulations. This implies also that the consideration of the impacts made in the original Regulatory Impact Review (RIR) covers the full range of those that will occur under each of the management adjustments that may be taken under the approved framework FMP.

6.2.1 Annual Review

A. The Council shall establish and appoint the members of a Bottomfish Monitoring Team which is necessary to assist Council in carrying out its functions under the MFCMA. The Team will have lead responsibility for preparing an annual report on the effectiveness of the plan in meeting its objectives. The composition of the Team will be decided by the Council. The Team will work closely with NMFS, Coast Guard, State, and Territory officials to ensure that data submission requirements and data collection programs are generating the data necessary for effectively monitoring the fishery and determining whether different management measures are necessary. The Honolulu Laboratory will be responsible for providing timely data analysis, summaries, and research results on the bottomfish fishery for use by the Monitoring Team. The Team will prepare an annual report on the fishery by March 31 each year containing the following information about the previous year and comparative results for prior years to the extent data are available for each area of the FCZ and adjacent waters around the main Hawaiian Islands, Northwestern Hawaiian Islands, American Samoa, and Guam.

1. Fishery Performance Data

- a. Total landings (commercial and recreational) by species by area per month.
- b. Estimated ex-vessel revenues by species.
- c. Number of vessels, numbers of fishing trips, days fished, landings per trip, species composition of landings, areas fished, catch by area, catch per day by area, and other indicators of performance for commercial and recreational fisheries.
- d. Biological characteristics of the landings, including size-frequency by species by area.

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 Territory Management Actions
7. Assessment of Need for Council Action
 - a. Biological conditions and trends.
 - b. Economic conditions and trends.
 - c. Social conditions and trends.
 - d. Enforcement problems and significance
 - e. Administrative problems.
 - f. State/Federal consistency.
8. Recommendations for Council Action
9. Estimated Impacts of Recommended Action

B. Among the criteria which warrant further investigation into potential problems are the following:

1. The Mean Size of the Catch of Any Species in Any Area is Pre-Reproductive

Mean size of catch is a simple and probably sufficiently reliable indicator of the health of the spawning stocks of particular species in the areas for which catch statistics are aggregated. If the mean size of the catch of particular species falls below the first reproductive size, this is a clear indicator of a risk of recruitment failure.

2. Ratio of Fishing Mortality to Natural Mortality for Any Species

Where the collection of catch and effort data has only recently been initiated or where there are problems in measuring the fishing effort component from available catch statistics, it is valuable to approach yield assessment independent of a time series of catch and effort data. Polovina and Ralston (ms. in prep.) have developed a species-specific approach for the Marianas Archipelago which can be applied anywhere in the western Pacific to bottomfish species for which growth and mortality parameters can be estimated. The Beverton-Holt equation was used to evaluate the impact of fishing mortality on spawning

stock biomass and some generic guidelines were prepared by Polovina (draft ms., 1985) for two situations:

- o When the size of entry to the fishery exceeds the size at onset of sexual maturity, fishing mortality should not exceed twice the level of natural mortality.
- o When the size of entry to the fishery is less than or equal to the size at onset of sexual maturity, fishing mortality should not exceed natural mortality.

It has been suggested that, as a general lower bound, the spawning stock biomass of a species should not be reduced below 20 percent of its unexploited level before a substantial reduction in recruitment will occur (Beddington and Cooke, 1983). Adherence to the proposed guidelines would guard against recruitment failure in the bottomfish fishery. Approximate mortality parameters and sizes at onset of sexual maturity have been or soon will be estimated for most of the management unit species. This indicator, therefore, could provide the basis for timely management action for many of the FCZ fisheries. However, in developing fisheries, it will take a long time for the effects of harvesting to be translated into bottomfish size structure. In addition, fishing mortality may be underestimated in a fishery which is rapidly expanding in the area of grounds fished. The difficulty and cost of obtaining valid estimates of natural mortality and fishing mortality for new management unit species could render this indicator ineffective except for present management unit species.

3. Harvest Capacity of the Existing Fleet and/or Annual Landings Exceed Best Estimate of MSY for the Entire Charted Bottomfish Habitat in Any Area

Although MSY (Section 8.1) can be estimated only approximately for the western Pacific bottomfish fishery, any area in which total landings equal or exceed MSY and/or where total harvest capacity could take the entire MSY would probably have a high risk of overfishing. This is a sensitive indicator which can be estimated with available data.

4. Significant Decline (50% or more) in Bottomfish CPUE from Baseline Levels

A significant decline in catch per unit effort (CPUE) is the most commonly used indicator of deteriorating fishery conditions. Declining CPUE in western Pacific bottomfish fisheries, on a species or species group basis, could indicate

that one or more stocks are being overfished. A major disruption of the fishery would be indicated by a 50% decline from the CPUE of a baseline level, especially if combined with declining landings. Commercial fishermen in the NWHI have kept moving northwest through the chain of banks and islands to maintain a high CPUE as catch rates decline in the southern reaches of the NWHI. The CPUE of new entrants to the fishery starts relatively low and increases as they become more proficient.

CPUE is not a particularly sensitive indicator in some areas of the western Pacific because of problems with established catch/effort data reporting and collection systems, especially in measuring the effort component.

5. Substantial Decline in Ex-Vessel Revenue Relative to Baseline Levels

A substantial drop in ex-vessel revenue for the bottomfish fishery (relative to historical baseline levels) would indicate a change in the economic condition of the fishery deserving further investigation. Ex-vessel revenue changes can be assessed with available data and are relatively sensitive in detecting problems. If changes in ex-vessel revenue are a leading indicator, biological indicators will ultimately confirm the cause after more data are accumulated.

6. A Significant Shift in the Relative Proportions of Gear in Any Area

Vertical hook-and-line gear predominates in the western Pacific bottomfish fisheries. When bottomfish are aggregated, this is an efficient method of harvesting. Experimentation can be expected with bottom longline gear and trap gear. A significant shift away from vertical hook-and-line to either bottom longline or trap fishing would provide an indication of a change in fishing efficiency. Such a change could indicate the need for management.

7. Significant Change in the Frozen/Fresh Components of the Bottomfish Catch

Western Pacific bottomfish fisheries have historically supplied the fresh fish market. Hence, fishing has always been limited to areas within reasonable (relative to the shelf life of the targeted species) traveling distance from the fresh market.

A number of initiatives to develop markets for frozen bottomfish in Hawaii have apparently not succeeded. Should the marketing situation become more favorable for frozen bottomfish, this would provide an incentive to fish in the northernmost reaches of the NWHI, where bottomfish stocks are relatively unexploited.

A shift toward frozen products could stimulate greater fishing pressure throughout the entire Hawaiian Islands range of the major species. Also, since boats could stay longer on the fishing grounds per trip, they would catch more per trip (per unit of time out of port), which represents a net increase in fishing effort. This could indicate the need for management response.

8. Entry/Exit of Fishermen in Any Area

Entry and exit patterns in any fishery provide an indication of its economic and social stability. A highly unstable pattern (relative to a historic baseline) could indicate that the goal of maintaining a profitable commercial fishery and rewarding recreational and subsistence fisheries is not being achieved. Entry/exit patterns have the potential to be a relatively sensitive indicator if a permit system is established to record participation in the fishery. If entry/exit patterns are a leading indicator of instability, lagging biological indicators will ultimately confirm the cause after more data are accumulated.

9. Per-Trip Costs for Bottomfishing Exceed Per-Trip Revenues for a Significant Percentage of Trips

In any fishery, the per-trip revenues must remain above the per-trip costs over the long term for the fishery to remain economically feasible. Even in the part-time fishery for deepsea bottomfish, if operating costs exceed revenues for a majority of trips, a change in targeted species or fishing grounds may occur, or the decision to bottomfish part-time or recreationally may be re-evaluated. The paucity of cost-earnings data specifically for the bottomfish fishery would have to be overcome before this indicator could be completely functional. Although less sensitive than a decline in ex-vessel revenue overall, a per trip cost and revenue comparison is promising as an indicator of economic stability in the bottomfish fishery.

10. Significant Decline or Increase in Total Bottomfish Landings in Any Area

A significant decline or increase in total landings of targeted bottomfish species is a clear indicator of changing fishery conditions. Only commercial landings data are available on a relatively current basis in Hawaii and American Samoa. Moreover, landings alone are not a very sensitive indicator for timely management action. If management action were initiated only after landings have dropped sharply, action probably would be too late to prevent overfishing and associated costs.

11. Change in Species Composition of the Bottomfish Catch in Any Area

A change in the bottomfish catch composition from the existing species mix in any area would be a clear indicator of a problem but would probably be detected too late for effective management responses. Even when such a change occurred, its cause could be (1) environmental disturbances, (e.g., El Nino events), (2) habitat alteration, (3) species interactions, or (4) actual shifts in relative abundance of species. Some of these variables could affect other indicators, such as total landings.

12. Research Results

Research results in the western Pacific or in other areas could indicate the need for more investigation and possibly management adjustments in the bottomfish fishery. Examples of pertinent research results might be:

- o General information on bottomfish presented at conferences and workshops (e.g., "Workshop on the Biology of Tropical Groupers and Snappers", Honolulu, May 1985).
- o Information on fishery habitat condition and productivity developed by deepwater submersible vessels and research associated with other resource uses; e.g., deepsea mining.
- o Information on fishery/protected species interactions.
- o Information on the selectivity and catch rates of experimental fishing permits issued under this FMP.

13. Habitat Degradation or Environmental Problems

The potential yield of western Pacific bottomfish fisheries is habitat-limited. Habitat degradation or loss on a scale that might have little negative impact on a continental shelf fishery can be of major concern in a Pacific island bottomfish fishery because of the limited amount of bottom area that satisfies bottomfish habitat requirements. Therefore, any indication of habitat degradation, even on a small scale, is deserving of further investigation in the annual review. Habitat modification could occur as the result of a small-scale project (e.g., an OTEC facility) or a destructive gear type, or as the result of a large scale environmental disturbance (e.g., an El Nino event or major hurricane). The sensitivity of this indicator generally will be low, because small-scale effects (e.g., thermal barriers to recruitment of larval fishes associated with an OTEC discharge) may escape detection, and large-scale climatic and oceanographic effects of events such as El Nino could overwhelm and disguise smaller-scale problems.

14. Reported Interactions Between Bottomfishing Operations and Protected Species in NWHI

Increased fishing efforts in the NWHI could possibly lead to increased fishermen-protected species interactions. "Taking" a species means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Fishermen are required by law to report to the NMFS any incidental "takes" and/or interactions during fishing vessel operations. Reports of fishermen-protected species interactions provide valuable information that may help reduce or eliminate harmful interactions in the future.

The ESA Section 7 Biological Opinion has set an acceptable level of "incidental take" of the listed sea turtles (Table 9.1, Appendix J). The Biological Opinion has also set criteria for the reinitiation of the formal Section 7 consultation. Should any of these criteria trigger the reinitiation of consultation, the Regional Director of the National Marine Fisheries Service would contact the Council, the appropriate Recovery Team, and such other individuals or organizations as may be relevant to obtain information concerning the possible effect of the reported taking or the activities resulting in the reported taking on the affected species or populations. The Section 7 consultation could suggest the need for regulatory adjustments under the framework procedure.

Summary:

Although all of the indicators described could be of use to the Bottomfish Monitoring Team, obviously not all are supported by an adequate data base. It would be unreasonably costly to collect the necessary data for all of the indicators to become completely functional and equally sensitive. The paucity of complete data is a familiar limitation in assessing and managing western Pacific fisheries. Considering the size and fragility of the bottomfish and seamount groundfish resources, the Team will need to rely on "leading" indicators in making recommendations to the Council, and the Council must be willing to respond before the weight of indisputable evidence has accumulated--by which time the fishery could be severely damaged or disrupted.

C. Evaluation of Alternatives (if necessary). During the annual review or at any time that the indicators raise concerns that warrant further investigation of fishery problems, the Council's investigation will assess alternatives and may conclude that a management adjustment is necessary to achieve FMP objectives and optimum yield. The following alternative adjustments will be considered before recommending that action be taken by the Regional Director. One or more alternatives could be recommended to apply to commercial, recreational, or subsistence components (or any combination) in one or more sub-areas of the FCZ (American Samoa, Guam, main Hawaiian Islands, Northwestern Hawaiian Islands, Hancock Seamounts).

- a. Catch limits
- b. Size limits
- c. Closures
- d. Effort limitations
- e. Access limitations
- f. Other measures

D. Recommendations (with justification relative to Council objectives and estimated benefits and costs). At a minimum, the following range of impacts will be considered in the analysis accompanying each recommendation:

- a. Biological/Physical Impacts on:
 - . Management unit stocks/habitats
 - . Protected species.

b. Economic and Social Impacts on:

- . Small-boat fishermen
- . Large-boat fishermen
- . Commercial Fishing
- . Recreational/subsistence fishing
- . Multi-species, multi-gear fishing operators
- . At-sea discards
- . Potential for gear conflict
- . Markets/consumers

c. Administrative Impacts on:

- . Enforcement difficulty and cost
- . Data reporting burdens on fisheries
- . Data collection and processing burdens on fishery managers
- . Biological/economic research needs

The Team may present recommendations to the Council for any of the following actions by the Regional Director, Southwest Region, NMFS (the RD), or other organizations:

- a. Federal regulations
- b. State/Territory action
- c. Enforcement/administrative elements
- d. Research and data collection

Any such recommendations will include a determination of urgency and an assessment of the impacts of not taking action as recommended.

It must be noted that a Bottomfish Monitoring Team with the timely assistance of the Honolulu Laboratory will continually monitor the performance of the fishery throughout the year relative to the factors to be described in the annual report. The Team may at any time recommend that the Council and RD take action to address a problem identified during a year. The framework process described above could be used for in-season adjustments as well as annual adjustment to the management and conservation program for bottomfish fisheries.

E. Council and RD Action. The assessment will be distributed to voting and non-voting Council members, the Scientific and Statistical Committee (SSC), and the Bottomfish Advisory Subpanel (AP). The Council will request the views of these subgroups at the next Council meeting. At that meeting, the Council also will schedule a public hearing to afford an opportunity for public and industry inputs to be put on the record. The hearing notice will be announced in the Federal Register as well as in local news media.

The Council will discuss the Team report, the views of the SSC and AP, and public and industry comments made at the hearing, and will make recommendations to the RD. The recommendations will be documented with relevant data and public comment and will explain the urgency of the action. The Council also may recommend action by State or Territory agencies or the Coast Guard.

The RD will consider the Council's recommendation and accompanying data and, if he concurs, will propose regulations to carry out the action. The proposed regulations will be published in the Federal Register, with a reasonable period for public comment consistent with the urgency of the need to take action. Final regulations will subsequently be published unless new information from the comment period indicates that there is reason not to implement the recommendations of the Council.

If the RD rejects the Council recommendations, or decides after public comment not to implement the recommendations, he shall provide reasons for that decision in writing within two weeks of the decision.

The Council may appeal to the Assistant Administrator (AA). The appeal shall be considered filed upon receipt by the Assistant Administrator of a written letter from the Council stating the reasons that the proposed regulations should have been implemented by the Regional Director. The Assistant Administrator shall determine whether the proposed regulation is consistent with the Magnuson Act within thirty (30) days after the appeal is filed.

6.2.2 Adoption of State/Territory Measures for FCZ

The Council acknowledges that the fishery for bottomfish in American Samoa, Guam, and the main Hawaiian Islands occurs predominantly in the territorial sea. The Council also has recognized the importance of ensuring that State and Territory management measures and Federal management measures be consistent across the territorial sea and FCZ boundaries. State and Territory measures may be set by statute and administrative proceedings on a schedule that does not coincide with the Council's annual review and decision schedule. It is quite possible as a result that there could be a period in which State or Territory regulations would differ from Federal regulations for a period of several months if there is no provision for reconciliation of such differences under a framework approach. The Council proposes the following system to minimize the risk of problems of this sort.

The appropriate State or Territory fishery agency member shall forward to the Council each change in its laws, regulations, or other directives applicable to fishing for management unit species in its territorial sea or adjacent FCZ. If possible, such changes shall be sent when in a proposal stage before action is taken so the implications for FCZ management can be considered to all voting and non-voting Council

members, the SSC, the AP, and the Bottomfish Monitoring Team. The notice of the next Council meeting shall indicate that the Council will discuss and will receive industry and public comment at that time on the potential implementation of a companion measure under this FMP for the FCZ adjacent to the State or Territory involved.

At the meeting, the Council shall decide whether to recommend Federal adoption by the RD, and if so recommending, shall indicate its reasons, the urgency of the action (including consideration of timing to coincide with State or Territory action), and the potential impacts (in terms of FMP objectives) of implementing or not implementing the change. This recommendation shall include consideration of an analysis by the Team of the benefits and costs of adopting the measure in the FCZ. The Team shall assess the impacts on the bottomfish stock(s) involved, fishermen, markets, and consumers. This analysis shall also explain why other actions were not proposed.

The RD shall consider the recommendation of the Council, including the associated data and impact analysis, and review the measure(s) proposed relative to the Magnuson Act national standards, other applicable law, and FMP objectives. If the RD concurs, he shall publish the proposed regulations in the Federal Register and provide a reasonable period for public comment consistent with the urgency of the action.

If the RD rejects the Council recommendations, or decides after public comment not to implement the recommendations, he shall provide reasons for that decision in writing within two weeks of the decision.

The Council may appeal to the Assistant Administrator (AA). The appeal shall be considered filed upon receipt by the Assistant Administrator of a letter from the Council stating the reasons that the proposed regulations should have been implemented by the Regional Director. The Assistant Administrator shall determine whether the proposed regulation is consistent with the Magnuson Act within thirty (30) days after the appeal is filed.

6.3 Alternative Adjustments Available Under Framework

The kinds of management actions which could be instituted in response to changing fishing conditions include the following:

6.3.1 Catch Limits

Catch limits (quotas) could be implemented for one or more sub-areas. They could be applied to the mixed-species bottomfish complex, to one or more individual species, or to incidentally-caught species. Quotas would place a ceiling on total annual (or other period) harvest,

and once a quota is reached, no additional fishing would be permitted. Quotas usually encourage a large pulse of competitive fishing and are usually filled early in a season. In fisheries managed under quotas, the supply of fresh fish is curtailed after the harvest level is reached. Quota management usually results in progressively shorter seasons open to fishing to prevent a growing fleet from exceeding conservation determined quotas. Although catch limits could prevent biological overfishing, they would not prevent overcapitalization of the harvest sector. Catch limits would tend to accentuate the natural instability of fresh fish supply which is inherent in Pacific island fisheries. To be effectively enforced, a quota system normally requires reporting or data collection in all components (commercial, recreational, and subsistence) of the fishery and timely compilation of data so that fishing will not continue beyond the time when the quota is achieved. Variations such as quarterly quotas or quotas for specific fleet components could offset some of the disadvantages but could require additional monitoring or accelerated data collection and processing.

An alternative method of limiting total catch is to establish an individual fishermen's quota which is a derivative of an overall catch quota. Under an individual quota system, each fisherman who received rights to participate in the fishery would be guaranteed the opportunity to a predetermined percentage of the total harvest quota established annually (or for some other period) for the fishery regardless of when and where he chose to fish. The initial allocation of shares could be limited to fishermen who participated in the past or who have already made major sacrifices to enter the fishery. Each year, a catch quota would be determined for each fisherman based on his initial entitlement and the condition of the stocks. Annual changes in the total harvest quota could be automatically apportioned among shareholders. The shares could be fully transferrable, except that a limit could be placed on the number of shares that any one fisherman could own.

Each fisherman who is allocated a share would have the choice to harvest that amount of bottomfish, increase his catch by buying more quotas from other share-holders, reduce his catch by selling some of his quotas, or not fish at all for the year by selling all of his quotas (while still retaining his initial entitlement). Persons lacking a record of historical participation could participate in the fishery by purchasing unused quotas from shareholders. This would allow new participants in the fishery without increasing the overall catch of the fleet.

The system would provide flexibility within the fleet with free exchange of shares (for privately negotiated terms between buyer and seller) and should avoid the need for extensive gear or vessel restrictions to limit overall fishing mortality. However, there is a possibility that fishermen would upgrade their individual harvesting capacity to reach their quota faster, thus freeing the vessel from further operating cost or allowing it to participate in other fisheries. Shares would probably tend to shift to those with higher incomes.

A share system poses some significant problems in implementation, with the most obvious being that of enforcement. Assignment of individual quotas would give fishermen a strong incentive to under-report their catch to misrepresent the species landed, or to land at remote, unpoliced sites so they could continue fishing. Constant monitoring of ex-vessel sales would be required for the system to be effective. At-sea enforcement, including observers or boardings, might be needed to discourage large discards designed to maximize the value of limited quotas.

In any fishery where there is substantial variability in catches (due to chance, weather, or seasonality of species) over the period of a fisherman's quota, the quota will lead to suboptimal catch concentrated early in the period, just as with annual quotas. It is possible to have some boats which have filled their quotas early sitting idle while the total quota for the fishery is not taken (Clark, 1985).

Fishermen's quotas have the effect of truncating catches at the quota limit. Hence, the expected catch is smaller than the quota. Many fishermen rely on the occasional lucky catch, and they view a quota as preventing them from realizing this important though irregular windfall (Clark, 1985).

6.3.2 Size Limits

Minimum size limits could be established for one or more individual species but would only be effective if fish were landed whole or gilled and gutted. Size limits could not be applied to a frozen fillet fishery. The minimum sizes would correspond to the size at onset of sexual maturity for females of the species. A length at onset of sexual maturity of 50% of maximum length is suggested for a range of island snapper populations (Grimes, draft ms., 1985; Grandperrin and Brouard, 1984). For some species, the size at onset of sexual maturity is known more precisely (e.g., Hawaiian opakapaka = 3 pounds; ehu = 1 pound). Minimum size limits are not an appropriate measure to apply to the management of groupers because the size at onset of sexual maturity varies with population structure. In American Samoa and Guam, where there is a strong cultural preference for small sizes of fish ($\frac{1}{2}$ to 2 pounds), minimum size limits for bottomfish would be extremely difficult to enforce.

Minimum size limits would, in the long term, assist in achieving stable patterns of catches of bottomfish in the size ranges preferred for the commercial market. Medium to large fish are preferred to supply fillets to the Hawaii restaurant market (Hau, 1984) because the percent yield of edible material is high, handling costs per unit weight are lower, larger fish often keep better, and more uniform products can be made from them. A negative impact in Hawaii would be the disruption of the household retail market for small bottomfish.

Minimum size limits for bottomfish could be increased to the target size all at once or incrementally. An example of an incremented increase would be for the State to raise the current minimum size for sale limit for opakapaka from the existing one-pound limit to 3 pounds (the size at onset of sexual maturity in the majority of females) over a period of 4 years ($\frac{1}{2}$ pound per year). Management recommendations which increase the age at entry must be sensitive to the short-term response of the fishery. The short-term loss to the fishermen while the population structure is readjusting to the higher age of entry may exceed the long-term gain (Waters, 1983).

Bottomfish fishermen who are marginal commercial producers may not have the financial ability to remain in the deepsea handline fishery during the transition period while short-term losses are being incurred. The chief beneficiaries of a sudden increase to a target size limit would be commercial fishermen who have staying power through the transition period and new entrants once a new equilibrium is established. In such situations, a gradual increase in the age of entry through small annual increments is preferable to a single-step increase to the optimal age of entry.

The effect of minimum size limits would be to increase the yield per recruit by raising the age of entry into the fishery. Associated benefits could be to augment the spawning stock and subsequent recruitment. A larger spawning population is expected to increase the size of future year classes, although this outcome may not directly occur due to (1) chance events affecting the spawning-recruitment process; (2) population density-independent egg production; and (3) environmental carrying capacity constraints.

Deepwater bottomfish usually suffer damage from gas expansion as they are hauled to the surface and are landed nearly dead with little or no chance of survival if released. Therefore, a minimum size limit for bottomfish must aim to discourage the capture of undersized fish rather than to require the release of undersized fish which will not survive. There are two means by which fishermen can avoid capturing undersized bottomfish.

Experimental bottomfishing trials with different hook sizes fished simultaneously indicate that small hooks (Nos. 28 and 30) are more effective in capturing small fish (less than 45 cm FL) than are larger hooks (Nos. 34 and 38) (Ralston, 1982). Thus, fishermen can reduce the capture of undersized bottomfish by using large hooks. However, even large hooks catch small fish, so the problem cannot be avoided entirely. There is another means for fishermen to reduce the catch of undersized bottomfish. If initial fishing in one area indicates a preponderance of small fish, fishermen can shift fishing areas to avoid concentrations of undersized bottomfish, but this means they will have caught some undersized fish which cannot be sold or retained.

Many fisheries rely upon minimum size limits despite the probable mortality and waste of fish which is dead when landed but cannot legally be retained. Forced release of undersized fish could serve to encourage relocation of fishing effort (away from concentrations of small fish). Minimum size limits could be applied to the commercial and recreational/subsistence components of the bottomfish fishery or both. A prohibition against the sale of undersized fish would be effective in regulating the commercial component, whereas a bag limit would be more effective for the recreational/subsistence component. Both measures are enforceable through dockside activities and, hence, are relatively less costly than other alternative responses.

6.3.3 Closures

Closures of the bottomfish fishery could be applied to any one of the management areas (American Samoa, Guam, main Hawaiian Islands, Northwestern Hawaiian Islands) or a portion of any sub-area (i.e., one or more separate banks). Area closures could be applied to a portion of the mixed-species complex in the FCZ, such as a nursery area where juveniles congregate. Seasonal closures could be applied to reduce fishing pressure on one or more individual species caught in the FCZ during one or more months of the year when the affected species are particularly vulnerable to capture (e.g., all or a portion of the spawning season or some other critical season).

As part of its marine conservation programs, the State of Hawaii has closed, temporarily or permanently, certain reef areas to all fishing. These experiences have amply demonstrated the beneficial effects of area closures in terms of reef fish stock recovery. It is highly likely that bottomfish populations would respond similarly to area closures. In the early days of the bottomfish industry in Hawaii there was voluntary rotation of fishing grounds by those participating in the fishery. Selective closure of various areas could offer several advantages:

- * Closure could provide an opportunity to restore balance to a mixed species fishery. The more aggressive species that are caught first would have an opportunity to recover.
- * Closure could protect concentrations of juveniles against premature harvest.
- * Aerial surveillance can detect boats that are actively fishing in a closed area.
- * Rotation of closed areas could keep the amount of area available to fishing at a constant level.

A large scale area closure in the recent past occurred during World War II when Hawaii was under martial law which brought about a cessation of deepsea fishing activities for several years. After the war, bottomfish and other species had accumulated, and the harvesting of surplus stocks caused bottomfish landings in the 1948-1953 period to reach one million pounds per year, a commercial harvest level not attained again until 1984.

The extent to which area/season closure would protect against overfishing depends on the magnitude of the closure. The size of an area closure could range from an area 2 to 3 miles in diameter to an entire bank, for example the Penguin Bank. Area closures large enough to encompass a significant portion of the home range of the affected species would be more effective, but observations of fishermen and scientists suggest that the extent of the home range is limited for some species (e.g., onaga, ehu), while extensive for others (uku, ulua). The growth rates of management unit species suggest that a 3-4 year closure would be needed to protect recruits of severely depleted populations until they grow to spawning size. Hawaii fishermen formerly practiced a self-imposed closure system, resting heavily-fished areas one or two years before resuming fishing. For species which form spawning aggregations during a 2- or 3-month period (e.g., uku), closures as short as one month could protect a portion of the stock, which is highly vulnerable to capture during spawning. However, most other species are not known to form spawning aggregations or they spawn over an extended period of the year, and seasonal closures unless of great duration would have less impact.

Although an area closure may allow depleted stocks to recover, it precludes the possibility of fishing the undepleted stocks that may be in the same area. This would be a detriment to fishermen who target the area for species other than those that the closure protects. An area closure, in protecting all stocks, would serve as a reproductive refuge, enhancing recruitment to nearby areas still open to bottomfishing. The benefits of an area closure cannot be assessed quantitatively without at least one experimental closure designed and closely monitored by management agencies and scientists. Some bottomfish fishermen home ported on the island of Maui have expressed support for experimentally closing a known bottomfish nursery area off leeward Maui to determine if and at what rate bottomfish stocks rebuild. The area proposed is under the management jurisdiction of the State of Hawaii.

Those who normally bottomfish in the areas selected for closure are likely to shift to alternative areas or to fisheries which are still open. This relocation of fishing pressure may interfere with the opportunities of existing users in the areas and fisheries which remain open. Information requested on the NWHI permit (Appendix A) will help fishery managers to predict likely shifts in fishing pressure caused by an area closure. Vessel information (operating and refrigeration capabilities) could provide estimates of the costs of relocation. Those who have to relocate bottomfishing activities as a result of area closures in the NWHI as well as the main Hawaiian Islands may incur increased travel times and associated vessel operating costs.

If the magnitude of an area closure is large enough, it may accentuate fluctuations in fresh fish supply and raise consumer prices. If a particular consumer population relies heavily on the area selected for closure, their supply of fresh bottomfish could be disrupted.

A seasonal closure for a particular species over a broad area to protect spawning stocks would disrupt the pattern of landings and the supply of fresh bottomfish. For example, a seasonal closure on the harvest of uku during the summer spawning season for this species would cut off the supply of one of the few bottomfish species available in substantial quantities to Hawaii consumers during the summer months. A closure of spawning areas would reduce catch rates and the efficiency of the fishing effort directed at the spawning stocks.

Although seasonal closures may increase the fish available for harvest in the short term, fishing effort may increase to exploit the available stock, leading to further and further reduction in the length of open seasons. Some fishermen may have the technical capability to shift to unregulated species, but others will not be able to do so. Closed seasons inevitably lead to an increase in fish discards at sea.

For year-round operations, most Pacific island fishing boats target a combination of species because they cannot catch enough of any single species, due to seasonal availability. A seasonal closure for any major species could disrupt the pattern of landings.

The 6-year fishing moratorium of the Hancock Seamount's FCZ is an experimental area closure prompted by the depleted stocks of seamount groundfish. The Honolulu Laboratory has initiated a Seamount Resources Study to monitor and investigate the recovery of the armorhead stocks. Assessment of the sustained fishery potential, coupled with other results, could be useful in guiding management of the common international resource.

6.3.4 Effort Limits

Several separate types of fishing effort limitation or some combination could be applied in any of the management sub-areas of the FCZ (American Samoa, Guam, main Hawaiian Islands, Northwestern Hawaiian Islands):

- * Limit quantities or types of gear
- * Limit landings (pounds) per trip
- * Limit trips or number of fishing days per year

All of these measures would introduce inefficiency to bottom-fishing operations, hence reducing fishing mortality to some degree. Their objective is to regulate the harvest rate, not just the annual amount of catch.

Catch and frequency limits on fishing trips re-allocate economic returns among the various size-classes of vessels. When trip catch (poundage) limits are low enough, smaller vessels would take a larger share of the annual catch than they would otherwise, and their profitability should improve relative to that of larger vessels. Larger vessels are designed to take advantage of profit opportunities related to large harvest volumes that the trip catch limits preclude. Therefore, the larger vessels could take a larger share of the annual catch, if a fishing trip limit was implemented.

6.3.4.1 Gear Restrictions

Gear restrictions to reduce fishing power in the hook-and-line fishery include measures such as limits on the size of vessels, on the number of lines or hooks, limits on the number of crew members per boat, or restrictions against the use of electronic fish-finding equipment. This group of measures was considered and rejected by the Council because they could not be enforced effectively at a reasonable cost. Gear restrictions on the hook-and-line fishery would not be an alternative response under the framework management procedure. However, the FMP is recommending a prohibition on the use of net gear to harvest bottomfish for reasons given in Section 6.1.

Additional gear restrictions could be implemented under the framework management procedures after sufficient information has been obtained. Restrictions might be placed on the use of traps or other gear. According to fishermen who have experimented with traps in the Northwestern Hawaiian Islands, trapping was such an efficient method of fishing that trapping on a large-scale could threaten productive fishing. Hook-and-line fishing relies on the feeding instincts of fish, whereas trapping relies on their curiosity and instinct for shelter. Fishermen believe that schooling management unit species may account for large trap catches of certain species such as ulua. Traps are an extremely unselective form of fishing gear as they catch almost any bottomfish species that can get into the trap opening (K. Kawamoto, WPRFMC, unpubl. memo). Restrictions on traps could range from a limit on the number of traps per vessel to a requirement for a trap design that reduces ghost fishing or a combination of both. Additional restrictions might be considered if interactions arise between fish traps and protected species in the NWHI. At present, traps are a minor gear type in the deepsea bottomfish fishery, and the indiscriminate harvest of undersized fish by traps or other gear may adequately be regulated in Hawaii by the State's minimum size limits for the

sale of major species of bottomfish (opakapaka, onaga, uku, ulua). There is little or no use of traps in the deepsea bottomfish fishery in American Samoa and Guam.

6.3.4.2 Limit Landings Per Trip

Bottomfish landings per trip could be limited for the mixed-species complex or for one or more individual species in any of the management sub-areas of the FCZ (American Samoa, Guam, main Hawaiian Islands, Northwestern Hawaiian Islands). This measure would be similar to a "bag limit". The State of Hawaii has set bag limits for several reef fish species, but not for deepsea bottomfish. Because of the different sizes and holding capacities of vessels in the bottomfishing fleet, a single landing limit would discriminate against larger boats. Scaling of limits could be established to match the size structure of the fleet.

Fishermen could circumvent a limit on landings per trip by making more trips. However, limiting the amount of landings per trip in essence places a ceiling on the revenue per trip. If fishing costs remain constant or increase with inflation, profitability will be reduced and presumably this will remove some of the per-vessel fishing effort directed to bottomfish.

The reduction of fishing effort per vessel would not reduce total fishing effort or fishing mortality in the long run if new units of harvesting (new boats) continue to join the fishery. However, the new boats would probably have smaller harvesting capacity because an individual vessel trip poundage limit would reduce the economic incentive for greater vessel catching capacity. Limits on landings per trip can be enforced by dockside activities, but enforcement manpower and budgets would have to be increased substantially to cover all of the possible landing sites both day and night.

6.3.4.3 Limit Trips Per Year

An alternative means of restricting fishing effort per vessel through inefficiency would be to limit the bottomfishing trips per year by the commercial or recreational/subsistence components (or both) of the fleet. Because of the variability in the operations of different sectors of the bottomfishing fleet, the trip limits would need to be scaled according to fleet structure.

Although fishing effort and mortality per boat might be reduced by limiting the number of trips per year there would be no reduction in effort/mortality if fishermen made longer trips to compensate for a limited number of trips. If frozen bottomfish becomes acceptable to the market, an increase in effort/mortality may occur as a result. In the long run, total fishing effort and fishing mortality would not be reduced if new entrants join the fishery. Trip limits would not require dockside enforcement as extensive as poundage limits per trip, although cross-checking of fishermen's trip reports would have to be thorough enough to discourage cheating. The recreational/subsistence component as well as commercial component of the fleet might need to be licensed. Trip reporting by both the commercial and recreational/subsistence sectors would have to be mandatory.

6.3.5 Access Limitation

Even if they could be effectively enforced, many of the measures which reduce fishing effort or introduce inefficiency would only bring temporary relief. Additional new fishermen to the fishery would still increase fishing effort (and fishing mortality) in the long run. Dividing the available resource among more hands will not necessarily prevent long-term deterioration of the fishery.

In recent years, regulations that are more explicit in their access/effort limitation objectives have been implemented in some U.S. commercial fisheries. These measures, generally labeled as limited entry regulations, have produced mixed results as compared with more traditional management techniques. Access limitation is a controversial method of management, but it is doubtful that any management decision the Council takes under the framework procedure for the bottomfish fishery, including "no action", would receive unanimous acceptance by the fishing industry and public.

Application of access limitation approaches to American Samoa and Guam may be beneficial but requires further analysis. The main Hawaiian Islands fishery, with its large number of resident fishermen, render blanket implementation of access limitation complicated and of uncertain benefit. Access limitation approaches under the FMP could be applied with clearer benefit to the Northwestern Hawaiian Islands bottomfish fishery. As part of the annual review, access limitation as well as other approaches would be considered for the FCZ of the NWHI. The Council during their 50th meeting, established August 7, 1985 as the cut-off date for participation in the NWHI bottomfish fishery if an access management measure is to be implemented in the future. This date was chosen by the Council to prevent a large influx of speculative entrants into the NWHI bottomfish fishery during the time interval needed to explore the access management option. The Council is fully aware that besides establishing a cut-off date, any proposed access limitation program must clearly define and qualify any performance

or eligibility criteria for the fishery, and the impacts of using these or other criteria in terms of the number of participants who will be eligible, how their catch is likely to change, and the associated effects on revenue and cost. The information requested on the NWHI permit application is needed to provide a general profile of the fleets' capabilities (range as well as refrigeration). The information is needed to make a rational decision on any area closure or access limitation option. Furthermore, the RD may not implement a limited entry management recommendation unless:

- (1) The annual review or special report of the Bottomfish Monitoring Team takes into account:
 - a. Present participation in the fishery;
 - b. Historical fishing practices in, and dependence on, the fishery;
 - c. The economics of the fishery;
 - d. The capability of fishing vessels used in the fishery to engage in other fisheries;
 - e. The cultural and social framework relevant to the fishery; and
 - f. Any other relevant considerations.
- (2) Public hearings are conducted on a specific limited entry design to provide opportunity for public comment on limited entry alternatives;
- (3) A provision is included in the limited entry recommendation that would create a new advisory subpanel of persons experienced in the Hawaii fishing industry which would advise the Council and the RD on administrative decisions relating to the proposed limited entry system; and
- (4) The Council recommendation to the RD is approved by at least a two-thirds majority of voting members.

These prerequisites will protect the fishermen's and public's interest on a controversial issue and will afford the opportunity for public comment on specific features of limited entry alternatives.

6.3.6 Plan Administration

The annual review will consider whether adjustments are needed to improve FMP administration. Administrative or enforcement adjustments might be recommended for implementation by the RD under the framework procedure.

6.3.6.1 Data Collection Adjustments

The Council may conclude that improvements in data reporting are required to improve the sensitivity of key indicators of fishery performance or to facilitate the annual review by the Bottomfish Monitoring Team. The Council may recommend specific improvements in cooperative Federal and State/Territory data collection programs or may recommend that the RD implement a Federal reporting requirement to collect catch/effort data for the FCZ if the initial reliance on State/Territory data reporting systems does not generate adequate information.

6.3.6.2 Enforcement Adjustments

If regulatory measures are implemented under the framework procedure, it may be necessary to make future adjustments to improve the enforceability of such measures. Although difficult to anticipate in advance, an example of such an adjustment might be to require boats returning from a fishing trip to specify a landing site, and to notify the authorities 24 hours in advance of landing to facilitate dockside enforcement.

7.0 ALTERNATIVES CONSIDERED, RELATIVE IMPACTS, AND RATIONALE FOR PREFERRED ALTERNATIVE

7.1 Measures Precluded From Council Consideration

Some potentially attractive management alternatives for the bottomfish fishery are precluded from Council consideration under existing provisions of the Magnuson Act. License fees levied upon vessels, gear, fishermen, or taxes on the catch could limit entry into a fishery since those who were unable to, or who did not wish to pay these costs would be discouraged from participating through economic means rather than regulations and fishing effort would be reduced proportionately. This would also allow the government to recover some part of the public expenditures for fishery management and enforcement, or for fishery enhancement.

7.1.1 License Fees

Although a FMP can require a Federal permit to harvest management unit species in the Fishery Conservation Zone, the Magnuson Act limits the permit fee which can be charged domestic fishermen to a level not to exceed the "administrative costs" of issuing the permit. Although attractive because they offer the potential to generate revenues from the fishery itself to offset enforcement, monitoring, and research costs, alternatives which involve the pricing of license fees at levels high enough to discourage fishing or which involve the allocation of individual fishermen's quotas through competitive bidding are not legally available to the Council under the existing provisions of the Act if they exceed administrative costs.

Nevertheless, indications of support for auctioning of fishery access may be found in the August 11, 1983 report by the Presidential Task Force on Regulatory Relief, "Reagan Administration: Regulatory Achievements". In the section on allocation of government-controlled resources, the report concludes, "Direct use of the price system, through auctioning licenses or charging fees, is all that is necessary to allocate the resources to those who can use them most productively" (page 44). Further, the report states, "Among the many areas where the auctioning approach could replace existing administrative mechanisms is the allocation of air space and landing rights and fishing rights where total harvest must be limited" (pages 44-45).

7.1.2 Taxation

According to economic theory, fishing effort could be shifted away from overharvested species through a landing tax or excise tax that is higher for overfished species than for underfished species. A tax implemented as part of a license or quota scheme could ensure that costs of management would not be borne by the Federal government. But taxes would pose practical difficulties for implementation and would create incentives to misreport species being landed in order to reduce tax payments. In any case, the Council cannot propose such a measure as a FMP regulation. A tax on bottomfish harvesting in the FCZ would have to be levied by the U.S. Congress, which is always sensitive to public reaction against new taxes.

7.2 Measures Rejected as Responses Under Framework Procedure

At its 44th meeting on April 23-24, 1983, the Council reviewed a comprehensive list of management possibilities for the western Pacific bottomfish fishery and rejected several on the basis that they would produce uncertain benefits or they would be prohibitively difficult and expensive to enforce.

- A. Vessel size limits. A limit on the size of vessel permitted to participate in the bottomfish fishery would be administratively and politically impossible to adopt. Since the current fleet is comprised of vessels of all sizes and types, the determination of the legal size limit might be impossible to support with adequate data and, therefore, could be considered arbitrary by those adversely affected. Limiting harvesting capacity by restricting vessel size would only produce a short-term limitation of effort, as new vessels of the legal size would continue to enter the fishery.
- B. Limit the number of lines or ³hooks per vessel. This type of regulation would probably be impossible to enforce in the bottomfish fishery because there is no way to ensure that vessels would only fish the authorized number of lines or hooks. In-port inspections of vessels immediately prior to a fishing trip would not guarantee compliance with such a regulation because this does not take into consideration that fishermen must have spare gear on board to replace any they may lose during a trip. Nothing would prevent a fisherman from fishing "spare" gear in addition to the legal limit of gear. At-sea enforcement of this regulation would be required because it would be impossible, through aerial surveillance, to detect the amount of gear a vessel was fishing. However, even at-sea enforcement would be ineffective because a fisherman could either discard excessive gear or, if hauling, could cut his gear when approached by

a surveillance boat. Even if enforceable, the effectiveness of this approach in reducing fishing effort would be temporary at best because of additional vessels entering the fishery.

- C. Establish a minimum hook size. This alternative was rejected because (1) it is not enforceable other than through at-sea boardings; and (2) its effectiveness in conserving stocks is uncertain. Such a regulation would be impossible to enforce through aerial surveillance, would require costly expanded at-sea enforcement, and could be circumvented through the use of two sets of gear -- a legal set for "show" and small hooks for fishing.
- D. Limit the number of crew members per bottomfishing vessel. The need to pay each crew member a share of the gross revenue already limits crew size on commercial vessels. The crew size on non-commercial vessels is not a good quantitative measure harvesting capacity. The fishing power of a vessel is related not so much to crew size as to the skill of the skipper and crew and their knowledge of the topography of the bottomfish grounds and their fish-finding ability. Vessel clearance immediately before a fishing trip would be required to aid enforcement of such a regulation. However, additional crewmen might embark and debark outside of home port. Aerial surveillance would be only partially effective, and sufficient dockside enforcement presence to enforce this regulation would be prohibitively expensive.

7.3 Alternatives Considered

7.3.1 General Approaches and Comparative Impacts

The Council considered several general approaches to management before selecting the preferred alternative consisting of the proposed measures described in Section 6.

A. Federal or State/Territory Management --

The FCZ portion of the seamount groundfish fishery is clearly subject to Federal management. The bottomfish fishery is transboundary, occurring predominantly in the territorial sea off American Samoa, Guam, and the main Hawaiian Islands and predominantly in the FCZ in the Northwestern Hawaiian islands. Although the primary management responsibility for the NWHI is clearly Federal, the responsibility for initiating bottomfishing regulations in the other areas has been intensely debated by fishermen, scientists, and managers.

Existing laws/rules of the State and territories apply to bottomfishing operations of state-registered vessels regardless of whether fishing occurs in the territorial sea or the FCZ. There is nothing to prevent the State/territories from adding new rules that would restrict bottomfishing operations by state-registered vessels, both in and beyond the territorial sea. It appears that Hawaii and Guam fishery agencies have statutory authority for much broader rule-making than the American Samoa agency.

The Bottomfish Plan Development Team seriously favored a management procedure for the FCZ off the main Hawaiian Islands, American Samoa, and Guam which would have relied on the local fishery agencies to initiate new controls on bottomfishing when faced with data demonstrating a conservation problem. The procedure would not have permitted Federal initiation of new controls for the FCZ until after a time period had elapsed with no local action. This proposal was viewed by local government reviewers as setting unreasonable "deadlines" on them, whereas, Federal government reviewers warned that the extended time period allowed for local initiation of controls could be too slow to respond effectively to problems arising in the fishery.

It was generally agreed that where State/territory management provisions are statutorily-established, it is not possible to initiate amendments except by the local legislatures during the part of the year when they are in session. Even then, it is not assured that amendments would receive legislative approval, as exemplified by the defeat of a measure to increase the minimum size of opakapaka for sale from one pound to three pounds during the 1985 session of the Hawaii State Legislature. In the absence of at-sea enforcement capability by the State/territories, local landing laws would remain the primary control for the bottomfish fishery under State/territorial management. The lengthy process involved in obtaining new legislation approval presents an obstacle to timely action.

Since the resources made available to State/territory fishery agencies are often inadequate for assessing the biological and economic status of fisheries, it may be difficult to determine the need for new management action. If the State/territories did not take action, Federal managers would be forced into the position of having to implement regulations that would as a consequence, not be consistent, with State/territorial laws, thus causing further problems. The preferred approach is a cooperative State/Federal management scheme involving joint assessment and monitoring followed by appropriate actions by the respective agencies to implement the indicated management action.

B. Framework FMP vs. Conventional FMP --

It is believed critical to maintain an opportunity to institute new controls reasonably rapidly in the bottomfish fishery, especially in the FCZ off Hawaii, where commercial bottomfish landings and presumably fishing effort are at record-high levels. Although the history of the main Hawaiian Islands' fishery does not suggest that bottomfish stocks are subject to a sudden collapse due to recruitment failure, fishing effort has never been so great. It is believed that the NWHI fishery has expanded rapidly by fishing standing stocks of species which had gone unfished for a long time and which are not capable of a sustainable production to match the harvesting capacity represented in the present fleet. These conditions require the ability to act rapidly when indicators raise concerns about the fishery.

The FMP proposes to institute a few regulations immediately, primarily to provide immediate protection for the extremely limited bottomfish habitat in the FCZ and to initiate cooperative Federal/State management which would be extended through the annual review and framework rule-making procedure.

The framework procedures equip the Council and the Regional Director of NMFS with broad rule-making authority comparable to the statutory authority which the Hawaii Department of Land and Natural Resources and the Guam Division of Aquatic and Wildlife Resources already have. The annual review requirement of the FMP could result in initiation of regulatory action by the Council under the framework procedure or by the State of Hawaii or Territory of Guam independently under existing authority. The administrative framework recommended is a way of expediting action on a faster schedule than under the procedures associated with a conventional FMP approval. The framework would not eliminate Regulatory Impact Analysis/Regulatory Flexibility Act requirements, public hearings, determination of consistency with MFCMA National Standards, or coastal zone consistency determination for any specific new regulation proposed. The framework procedure can be expected to save at least 140 days of time associated with the normal FMP approval process and perhaps as much as nine months of lead time associated with the normal informal review of a conventional FMP.

C. Single-Species vs. Multi-Species Approach to Management --

The bottomfish and seamount groundfish fisheries comprise a large number of species, only a few of which seem to be in danger of overfishing at present. The administrative burden and cost of FMP preparation can be reduced through development of a

single, comprehensive plan to manage these species as a unit throughout their range rather than creating a separate management plan for each species.

In view of the pragmatic advantages of single-species approaches and because of the relative selectivity of the hook-and-line fishery in terms of species harvested, the strategy of this FMP is to closely monitor the relatively few heavily-fished bottomfish species, with management decisions on a species-by-species basis. Data are insufficient and appropriate models are lacking for multi-species or ecosystem approaches to management. It is impossible to predict the long-term ecological effect of such a management strategy.

The species assigned to this complex have specific distributions and biological characteristics which enable fishermen to target individual species. The similarities in gear type, fishing methods and general habitat justify consolidating them for research and management units and treating them as a single fishery here.

D. Numerical vs. Non-Numerical Estimates of OY and DAH --

As with most fisheries in the western Pacific, the available data do not allow the definition of OY and DAH in numerical terms. It would be inadvisable to specify numerical estimates of what is "optimum" for some fisheries, particularly the NWHI fishery, which has rapidly been expanding its geographic range over the past 18 months and in which the optimum yield is not yet apparent.

E. Federal Data Reporting Requirements vs. State/Territory Data Collection

A Federal requirement for logbooks containing catch weight and number of fish by species, fishing effort, location, and other standard information could be established for vessels bottomfishing in the FCZ, with a standard requirement that these logbooks be available for inspection at sea by U.S. Coast Guard or NMFS agents, and be submitted within 5 working days of landing.

However, this approach would duplicate, to various degrees, data reporting systems already established by the State of Hawaii and the territories of American Samoa and Guam, some with Federal funding assistance. The Federal government has made an investment in a regional Fishery Information Network (FIN)

covering each of the island areas represented by the Council. Rather than duplicate this investment and create a new data reporting burden for fishermen, the Council believes that the established State of Hawaii and FIN data systems should be improved so that they can be relied upon for the annual review of fishery performance. The framework process under this FMP would allow the Council to recommend improvements in the State/Territorial data systems and to recommend that the Regional Director establish a Federal/State reporting requirement if initial reliance on State/Territory data reporting proves unsatisfactory. In making this assessment, the Council considered the practicality and costs of a more comprehensive requirement for data reporting.

The Council recognizes that commercial enterprises which have long submitted data covering their fishing trips and catches are likely to keep doing so willingly. The Council also recognizes that the many part-time commercial or subsistence fishermen or sports fishermen in the island areas served by the Council, some of whom only occasionally sell their catch, are less likely to submit detailed, accurate catch reports covering all of their fishing trips. The cost of enforcing universal catch and effort data submission requirements could be prohibitive.

7.3.2 Alternatives For Each Management Sub-Area

7.3.2.1 Main Hawaiian Islands

Commercial landings of bottomfish have never been at higher levels in the main Hawaiian Islands. Some of the biological indicators raise concerns about a high risk of overfishing, particularly of opakapaka. It is believed critical to establish an administrative framework for instituting new controls in the FCZ, although a major part of the fishery is conducted in the territorial sea.

Specific minimum size limits for bottomfish species were considered for the FCZ off the main islands. If implemented under a Federal landing law, such limits could cover all landings unless a vessel fished only in or was licensed to fish only in the territorial sea. This option raised too much potential for inconsistency in Federal/State management because of differences between the size limit which would be needed to raise the age at entry into the hook-and-line fishery and the existing one-pound minimum size limit for sale under State law. The likelihood that it could take years to increase the one-pound minimum size through the legislative route would make it difficult to bring about consistency.

7.3.2.2 Northwestern Hawaiian Islands

The rapid decline in CPUE at successive banks and the progression of bottomfishing vessels up the chain to Northampton Seamount, the extreme range of fishing for the fresh market, raise concerns about overfishing. It is believed critical to establish an administrative framework for instituting new controls in the FCZ, where virtually all of the fishing occurs.

A set of management options much like those considered for the MHI were discussed by the PDT. At the present time, the Council has proposed for immediate implementation a prohibition on the use of explosives and poison and the prohibition on the use of trawl and bottom-set net gear for the FCZ of the NWHI. Other options such as size limits, catch limit/quota, effort limits, gear limitation, area closures, and access limitation were discussed. The Council has expressed a strong interest in access limitation since the possibility for using this management option was first brought up by a group of concerned NWHI bottomfish fishermen. To that end the Council sponsored a Limited Entry Workshop for all interested parties in August of 1984 (WPRFMC, 1984) during the 46th Council Meeting. The Council has contracted in 1985 a study of the status of the bottomfish fisheries and options for management actions in the NWHI. The contractor has been working closely with the fishermen in developing management options.

When necessary, management options will be evaluated by the PMT and recommended to the Council for management action.

7.3.2.3 Guam

There does not appear to be a high risk of overfishing of the FCZ portion of the bottomfish fishery at present in Guam, although fishing effort is much greater in the territorial sea. In weighing Territory versus Federal management of the fishery, the Council concluded that the most urgent management needs should be addressed by the Territory. To strengthen the existing rule against the use of poisons and to provide the basis for long-term cooperative management of the transboundary fishery under the annual review and framework procedure, the Council concluded it was desirable to establish a complementary Federal regulation in the adjacent FCZ. Short-term Territory management strengthened by long-term cooperative Territory/Federal management under the framework process has a better chance of achieving the management objectives than either unilateral Federal or unilateral Territory management.

Although a Federal permit requirement was considered for the FCZ off Guam, it was considered unnecessary at this time because of low levels of bottomfishing and because it is not needed to aid aircraft surveillance of domestic fishing vessels in this area.

7.3.2.4 American Samoa

The options and conclusions are much the same for American Samoa as for Guam.

7.3.2.5 Hancock Seamounts

The Council considered 4 management alternatives for the FCZ portion of the seamount groundfish fishery.

Continue to allow some level of foreign harvest in the FCZ up to or below the present allocation (1,000 MT/year).

Under this alternative, the total allowable level of foreign fishing currently in effect under the Seamount Groundfish PMP could be continued up to the 1,000 metric ton level of annual harvest which has been allocated in recent years to Japan.

Limit total foreign fishing effort rather than total annual harvest in the FCZ.

Under this alternative, foreign vessels would be permitted to fish in the FCZ up to a total annual quota of effort (e.g., vessel days or trawl-hours) rather than a total annual quota of groundfish catch.

Place a moratorium (initially effective for 6 years) on all commercial trawling (foreign and domestic) in the FCZ portion of the seamount groundfish fishery.

Under this alternative, a moratorium, effective for an initial period of 6 years, would be imposed on all commercial trawling at the Hancock Seamounts. This will primarily restrict the foreign trawlers which have participated historically, but it is necessary to restrict domestic trawling as well to provide the controlled conditions for a scientific experiment comparing unexploited groundfish stocks (in the FCZ) and exploited stocks (outside the FCZ). During this time, the Seamount Resources Study of the Honolulu Laboratory of NMFS will monitor recovery of the stock and provide evidence of the sustained fishery potential. Experimental trawling necessary for this study would

not be restricted. Hook-and-line fishing would not be restricted.

Place a moratorium (initially effective for 6 years) on all commercial (foreign and domestic) fishing in the FCZ portion of the seamount groundfish fishery.

Under this alternative, a moratorium, effective for an initial period of 6 years, would be imposed on all commercial fishing of seamount groundfish at the Hancock Seamounts. This total ban is also recommended by the Honolulu Laboratory. Recent experimental bottom longline trials by the NMFS for harvesting groundfish indicates that a large commercial operation could have a serious impact on the already depressed stocks. The total ban on all fishing would preclude any possibility of additional damage to the stocks and allows the Honolulu Laboratory's Seamount Resources Study to proceed under controlled conditions.

The effect of continuing the present allocation of up to 1,000 metric tons per year to Japan or other nations is likely to be a further depression of the armorhead stocks at the Hancock Seamounts. Alfonsin stocks may also be depleted if foreign harvesters shift to this alternative target species as they have in the portion of the seamount fishery outside the FCZ. Managing the FCZ portion of the seamount fishery by limiting total fishing effort rather than total harvest would have only minor effects on the overall levels of pelagic armorhead in the Emperor Seamounts because populations on different seamounts are probably not separate stocks (Borets, 1975; Humphreys and Tagami, 1984). This is probably true of alfonsin as well. The chief benefit of allowing foreign harvesting to continue at some level in the FCZ portion of the seamount fishery would be continued availability of catch/effort data for the Hancock Seamounts. No increase in Federal responsibilities or costs are expected which differ from those incurred under the existing Preliminary Fishery Management Plan for Seamount Groundfish.

A temporary moratorium on all commercial fishing could be implemented as a scientific investigation to learn more about stock recruitment and recovery, while foreign harvesting continues at seamounts outside the FCZ. The benefits include rebuilding of the Hancock Seamount population and better scientific understanding of the population dynamics of the seamount species through comparison of exploited and unexploited populations of pelagic armorhead and alfonsin. Further, even a single seamount may serve as a reproductive refuge, enhancing recruitment to other seamounts. This research could guide an international plan of management for the common resource.

A total moratorium on all harvest of seamount groundfish would include the benefits of a trawling moratorium and

allow a more controlled study of the resource. The absence of domestic fishing activity will minimize immediate impacts of all the alternatives, but in the long-term, a moratorium on all fishing could restore the opportunity for U.S. fishermen to develop a new fishery. Hancock Seamounts represent a relatively small percentage of the total pelagic armorhead habitat which has been subject to the foreign trawl fishery, so a closure would not have a great impact on the fishery. Additionally, although alfonsin catch and CPUE have continued to rise in recent years, the contribution from Hancock Seamount has represented less than 1% of the total catch from the Emperor Seamount - northern Hawaiian ridge region. Thus, the impact to foreign fishing interests will be minor. Continuation of the foreign seamount fishery outside the FCZ will depend upon economic factors probably separate from whether Hancock Seamounts are closed to fishing or not.

The moratorium would terminate foreign harvesting and foreign fishermen who continue to fish outside the FCZ might retaliate by refusing to provide catch/effort data which will be necessary to understand the population dynamics of stocks on a regionwide basis. No increase above current levels of foreign fishing surveillance and enforcement by the U.S. Coast Guard is expected under this alternative.

7.4 Regulatory Analysis

The framework portion of the FMP is largely a procedural document which describes the processes by which the bottomfish and seamount groundfish fisheries will be managed and establishes the limits and controls within which regulatory adjustments may be made. Because the framework procedure is specifically not designed to pre-select any future regulatory action in detail, a detailed RIR/RFA of future management actions can only be accomplished at the time when specific regulations are proposed. However, the framework process does specify the categories of impacts that must be addressed in making future regulatory adjustments. In this manner, the requirements of Executive Order 12291 and the RFA can be addressed on a continual basis.

The estimated costs and benefits of general approaches to the FMP and for each management sub-area are quantified, in Appendix F, to the extent that available data permits.

8.0 DETERMINATIONS

8.1 Maximum Sustainable Yield

8.1.1 Bottomfish Fishery

Maximum sustainable yield (MSY) estimates derived for various areas of the western Pacific are summarized in Table 8.1.

TABLE 8.1

ESTIMATES OF MAXIMUM SUSTAINABLE YIELD (MSY)
BY UNIT OF BOTTOMFISH HABITAT

MSY Per Nautical Mile of 100-Fathom Isobath	Geographic Area For Which Derived	Reference	Methodology
286 kg (629 lb.) per nmi	Standing stock estimate based on intensive fish- ing experiment off Guam (Ikehara et al., 1970). MSY estimate derived for French Frigate Shoals.	Polovina and Tagami (1980)	Gulland's formula
272 kg (598 lb.) per nmi	Maui-Kahoolawe-Lanai- Molokai bank complex	Ralston and Polovina (1982)	Total biomass sur- plus production analysis
183 kg (403 lb.) ^{1/} per nmi	Mariana Archipelago	Polovina and Ralston, ms. in prep.	Beverton-Holt yield equation

^{1/} Guam and banks South of Guam only

The per unit estimate of 598 lb. per nautical mile of habitat per year (Ralston and Polovina, 1982) is applied to the entire Hawaiian Archipelago to obtain the following MSY values:

TABLE 8.2

MAXIMUM SUSTAINABLE YIELD (MSY) ESTIMATES
FOR THE HAWAIIAN ARCHIPELAGO

Area	MSY Per Unit Habitat	Amount Of Habitat	Total MSY Estimate
MHI	598 lb./nmi/yr.	997 nmi	596,000 lbs./yr.
NWHI	598 lb./nmi/yr.	1,231 nmi	736,000 lbs./yr.

Polovina and Ralston (ms. in prep.) derived island-by-island estimates of MSY in the Mariana Archipelago based on bottomfishing surveys and other research accomplished by NMFS.

TABLE 8.3

MAXIMUM SUSTAINABLE YIELD (MSY) ESTIMATE
FOR GUAM AND OTHER OFFSHORE BANKS

Area	MSY Per Unit Habitat	Amount Of Habitat	Total MSY Estimate
Guam and Other Offshore Banks	403 lb./nmi/yr.	138 nmi	55,000 lbs./yr.

No specific MSY estimates have been derived for American Samoa, but the per unit (nmi) yield is probably closer to that of Guam and its associated banks (403 lb./nmi/yr.) than that of Hawaii (598 lb./nmi/yr.).

Table 8.4 applies the Guam MSY estimate (Table 8.3) to the amount of habitat in American Samoa to arrive at a preliminary estimate of MSY for American Samoa.

TABLE 8.4

MAXIMUM SUSTAINABLE YIELD (MSY) ESTIMATE
FOR AMERICAN SAMOA

Area	MSY Per Unit Habitat	Amount Of Habitat	Total MSY Estimate
Am. Samoa	403 lb./nmi/yr.	169 nmi	68,000 lbs./yr.

8.1.2 Seamount Groundfish Fishery

Japanese catch and effort statistics (Takahashi and Sasaki, 1977) led to a preliminary MSY estimate of roughly 50,000 MT (55,000 T) for the pelagic armorhead stocks on all seamounts (Wetherall, 1978). One of the key assumptions of Wetherall's model was that Russian catch and effort were approximately equal to that of the Japanese. Borets (1975) suggests that total Russian catch from 1968 to 1975 was 1,457 million fish. Assuming a mean weight of 0.5 kg per fish, the total catch is 728,500 MT, some five times the Japanese catch (Anon., 1984). The available Soviet data do not cover the late 1970's period during which the armorhead stock collapsed and are inadequate to revise the estimate of MSY for pelagic armorhead as attempted by Wetherall and Yong (1984).

No MSY estimate is available for alfonsin or other seamount slope species, some of which may have considerably more potential than armorhead for exploitation by a domestic hook-and-line fishery. Considering the limited fishing grounds for alfonsin, akodai, medai, and like species, the potential yield is probably much lower than that of armorhead.

8.2 Optimum Yield

8.2.1 Bottomfish Fishery

The optimum yield (OY) to be achieved from the fisheries for species included in the management unit addressed by this framework plan is the amount of bottomfish which will be caught by fishermen in the FCZ and adjacent waters around Hawaii, Guam, and American Samoa under the management measures implemented under the FMP to achieve, to the greatest extent practicable, the following management objectives:

- a. Maintain the long-term productivity of bottomfish stocks and rebuild depleted seamount groundfish stocks;

- b. Maintain existing opportunities for rewarding fishing experiences by small-scale commercial, recreational, and subsistence fishermen including native Pacific islanders;
- c. Maintain a balance between harvest capacity and harvestable fishing stocks to prevent overcapitalization and provide consistent supplies of high quality fish to consumers; and
- d. Protect bottomfish stocks, habitat, and associated endangered and threatened species from adverse effects of destructive or indiscriminate fishing activities.

Because it is described in general terms, the OY will remain constant over the years. What will change is the abundance of different stocks in different areas and the knowledge of the effects of fishing on stock productivity and yields. Accordingly, the annual levels of harvest by different fishing sectors in different areas will vary. Each year, as part of the process of reviewing the prior year's fishery and assessing the need for regulatory adjustments, the Council will consider whether any species or species group in any area needs to be managed on a numerical basis.

Notwithstanding the non-numeric definition of OY, the Council has estimated the quantity (see Table 8.5) of bottomfish which is expected to be taken under this FMP based on current stock and economic conditions. These estimates may be considered as initial specifications of OY, although the numbers should not be construed as quotas. Whether actual landings are above or below the estimated amounts will not be cause for concern except in the context of the framework process of this plan (Section 6.2).

TABLE 8.5

INITIAL ESTIMATES OF OPTIMUM YIELD (OY)

Island Area	Likely Range of OY (lb./yr.)
American Samoa	50,000 - 70,000
Guam	30,000 - 70,000
Main Hawaiian Islands	400,000 - 600,000
Northwestern Hawaiian Islands	400,000 - 700,000

8.2.2 Seamount Groundfish Fishery

The OY for seamount groundfish initially is set at zero (0) metric tons (mt) per year through 1991. The Council has concluded that a

moratorium on the seamount groundfish trawl fishery in the FCZ is necessary to promote rebuilding of the stock(s). OY will be re-established after a determination is made on the ability of the groundfish stocks to recover. In the annual review, the Council will consider the results of research and experimental fishing in determining whether an early opening (or possibly longer closure) is appropriate.

8.3 Domestic Annual Harvest (DAH)

Experience in 1984-85 has demonstrated that the Hawaii fleet has sufficient bottomfish harvesting capacity to take the entire estimated maximum sustainable yield, both in the main Hawaiian islands and the Northwestern Hawaiian Islands. Demand for fresh bottomfish continues to increase with population growth and tourist arrivals, and domestic annual harvest of the management unit species is expected to remain high. Long-range NWHI boats each have the capacity to harvest 60,000-100,000 pounds per year (P. Meyer, unpubl. ms.), whereas small commercial vessels, each with 2 electric or hydraulic gurdies fishing 12 hours a day for 200 days a year can achieve a level of fishing effort to catch 16,000 pounds per year per vessel (Polovina et al., 1985). It is difficult to predict the actual catch levels, except they will fall in the same range as the reference points for OY. The reasons given for defining OY in non-numeric terms also apply to the definition of DAH, which for purposes of this FMP, is the quantity of each species in the management unit that will be caught by domestic vessels in the FCZ under the management measures implemented under the FMP to achieve, to the greatest extent practicable, the management objectives.

8.4 Total Allowable Level of Foreign Fishing (TALFF)

In the bottomfish fishery, the existing fleets in Hawaii, American Samoa, and Guam have sufficient harvesting capacity to take the entire maximum sustainable yield. Hence, the amount of management unit species available for TALFF is zero (0).

In the seamount fishery, the FMP proposes a moratorium on all commercial fishing for an initial period of 6 years, during which time the quantity of groundfish available for foreign fishing would be zero (0).

8.5 Domestic Annual Processing (DAP) and Joint Venture Processing (JVP)

There is no domestic processing of the management unit species in the industrial sense. The only imaginable processing that could occur would be the manufacture of "surimi", and, considering the relatively high price and limited supplies of bottomfish, this is unlikely. All of the landings of bottomfish presently enter local markets in fresh product forms. Although frozen bottomfish products may become more acceptable in established markets, there is no

reason to believe that DAP will be other than zero (0). Until an OY is re-established for the Hancock Seamount fishery, the amount of seamount groundfish available for joint venture processing is also zero (0).

8.6 International Management

There are no international treaties or bilateral agreements to which the U.S. Government is a party for the management of bottomfish or seamount groundfish. From an international standpoint, only the closure of the Hancock Seamounts to commercial fishing is of concern. Because of stock depletion, there is no foreign trawling in the area of concern, at present. One of the FMP objectives is to undertake a management experiment for the FCZ portion of the seamount groundfish fishery with the hope that the results could guide international management of the seamount stocks across their range.

8.7 Consistency With MFCMA National Standards

The proposed FMP is intended to conform with the National Standards of the MFCMA:

- a) Prevent overfishing -- The FMP acknowledges that the risk of overfishing appears to be high in the Hawaii FCZ. The FMP incorporates an annual review requirement designed to identify problems in the future so that they can be acted upon rapidly through an administrative rule-making framework. The biological evidence of overfishing is not definitive at present.
- b) Best scientific information available -- The FMP acknowledges the limitations of available data, but the best available information has been used to prepare the FMP and the annual review requirement will result in considerably improved data and analysis for future management.
- c) Inter-related stocks managed as a unit -- The FMP treats Hawaii, American Samoa, and Guam as individual management areas because there is no evidence of the mingling of larval or adult fish among these areas. However, bottomfish stocks in Hawaii, American Samoa, and Guam are treated as a unit throughout their range in the respective areas.
- d) Non-Discrimination between residents of different states -- The FMP does not propose any differential licensing programs or other requirements for residents of different states.
- e) Promote efficiency -- The FMP does not restrict the times, places, or methods of bottomfishing except that environmentally-destructive gear (bottom trawls and bottom-set nets) is prohibited in order to protect the limited amount of habitat, to provide added protection for endangered species, and to prevent gear conflicts.

- f) Allow for variations and contingencies -- The annual review requirement of the FMP allows for variations and contingencies to be considered by the Bottomfish Monitoring Team when concerns are raised by a prescribed set of indicators. The FMP does not automatically trigger regulations when changes in fishery conditions are indicated.
- g) Minimize costs and avoid duplication -- The FMP provides for a cost-effective means of monitoring for changes in fishery condition and, through an annual review requirement, assessing the need for regulation as problems arise. There is no duplication of existing data reporting requirements.

8.8 Documentation for a Finding of No Significant Environmental Impact

1. Proposed Action: Implementation of a fishery management plan for bottomfish and seamount groundfish fisheries in the fishery conservation zone (FCZ) of the western Pacific region.
2. Areas and Resources Involved:
 - a) Areas - The fishery conservation zone (FCZ) around the State of Hawaii, the Territory of Guam, the Territory of American Samoa, and the Hancock Seamounts;
 - b) Resources - Bottomfish, seamount groundfish and associated habitats to a depth of 300 fathoms.
3. Management Problems and Issues Considered:
 - a) Risk of overfishing as fisheries expand rapidly;
 - b) Maintenance of social and economic values associated with small-scale commercial, recreational, and subsistence fisheries in areas;
 - c) Consistency of management in the FCZ and State and Territory waters;
 - d) Need for timely data to identify and respond to future problems;
 - e) Protection of habitat from impacts of destructive gear (e.g., bottom trawls);
 - f) Avoidance of interaction with endangered and threatened species and;
 - g) Achievement of economically profitable fisheries;
 - h) Restoration of depleted seamount groundfish stocks.

4. Principal Elements of the Proposed Action:

a) All areas:

- (1) Cooperative State/Federal data collection and analysis;
- (2) Prohibit bottom-set nets and trawl nets to protect bottomfish habitat and prevent entanglement of monk seals and sea turtles;
- (3) Establish a framework for proposing regulations in the FCZ according to an administrative process consistent with the FMP, the Magnuson Act, State/Territory approved coastal zone management programs, and other applicable law.

b) Hawaii:

- (1) Establish a Federal regulation in the adjacent FCZ consistent with the existing State prohibition on the use of explosives and poisons to harvest fish.

c) Guam:

- (1) Establishing a Federal regulation in the adjacent FCZ consistent with the existing Territory prohibition on the use of explosives and poisons to harvest bottomfish.

d) American Samoa:

- (1) Establishing a Federal regulation prohibiting the use of poisons and explosives to harvest bottomfish in the FCZ.

e) Seamounts:

- (1) Six-year moratorium on commercial harvesting of seamount groundfish resources to restore depleted stocks;
- (2) Periodic reporting by NMFS to document degree of stock rebuilding and potential for reopening fishery.

5. Evaluation of Significance Relative to Specific FMP Criteria
(NDM 02-10 Section 13.b.)

- a) The proposed action is not expected to jeopardize the long-term productive capability of the stocks. The framework process will promote timely action by State and Territory agencies and the NMFS to address resource problems (if any) as they are identified. The cooperative State/Territory/NMFS data collec-

tion and analysis program will ensure that necessary data are available at minimal additional cost. The moratorium on the harvest of seamount groundfish will permit depleted stocks to rebuild. The prohibition on the use of nets will limit the risk of waste associated with nonselective gear and reduce the potential for taking substantial numbers of small fish;

- b) The proposed action will not allow substantial damage to the ocean and coastal habitats. The prohibition on trawl and bottom-set net use will prevent habitat damage;
- c) The proposed action will not have an adverse impact on public health and safety. The markets for bottomfish have established high quality standards. The proposed action should promote maintenance of these standards;
- d) The proposed action is not expected to affect adversely any endangered or threatened species. The prohibition on trawl and bottom-set nets to harvest bottomfish will significantly reduce the risk of incidental taking of Hawaiian monk seals and sea turtles by bottomfish fishermen;
- e) The proposed action will not result in cumulative adverse effects that could have a substantial effect on the target resource species or any related stocks that may be affected by the action. The proposed action will establish a monitoring and reporting program to determine if the objectives of the plan are being achieved and to identify corrective actions if resource problems are subsequently identified.

6. Other Considerations:

- a) Socio-economic impacts - The proposed action is intended to maintain the economic and social values associated with established small-scale commercial, recreational, and subsistence fisheries around the populated islands in Hawaii, Guam, and American Samoa. Most of the fishing in these areas occurs in the territorial sea, under varying degrees of control by the respective island governments. The framework process provides for systematic, cooperative assessment of fishery conditions so that problems and solutions can be identified and fishery values can be maintained in the NWHI;

The proposed action will promote rebuilding of seamount groundfish stocks so that an economically viable fishery can be resumed;

- b) Controversy - The Council has worked closely with State and Territory officials and the fishing community in developing the management program over the past 3 years. The risk of controversy appears to be low;
- c) Uncertainty - The data base has been substantially improved in the past several years. The Council has worked closely with the industry to obtain current data. The Honolulu Laboratory (SWFC), U.S. Fish and Wildlife Service, and State of Hawaii conducted a five-year Tripartite Survey of the NWHI which greatly expanded the knowledge about fishery potentials. The Honolulu Laboratory also has conducted or funded a substantial amount of economic research and has assisted Hawaii, Guam, and American Samoa in establishing effective data management systems. While there is some uncertainty about how fishery participants will operate in the future and about stock responses to fishery pressure, the proposed action provides a mechanism to assess changes and implement new measures if necessary. Therefore, uncertainty is not a significant problem;
- d) The proposed action will protect against damage to scientific resources of the NWHI. No other significant scientific, cultural or historic resources will be affected.

7. Conclusion:

The proposed action will not have a significant effect on the quality of the human or marine environment. Such impacts as will occur are generally beneficial.

9.0 RELATIONSHIP OF FMP TO OTHER APPLICABLE LAWS AND POLICIES

9.1 Coastal Zone Management Act

Section 307(c)(1) of the National Coastal Zone Management Act of 1972 (CZMA) requires that all Federal activities which directly affect the coastal zone be conducted in a manner which is consistent with approved State coastal zone management (CZM) programs to the maximum extent practicable. The State of Hawaii and the Territories of Guam and American Samoa have approved CZM programs.

The FMP proposes to adopt selected features of the current management programs of the state and territories in the adjacent FCZ. Thus the level of protection which the existing State/Territory measures provide for bottomfish habitat in the territorial sea would be extended to the FCZ. This should contribute to consistency in State/Federal resource management.

The FMP would also prohibit the use of nets to harvest bottomfish. Although no comparable laws/rules currently exist in the State/territories, approved coastal zone programs in all three areas call for the protection of marine habitats. The prohibition on net gear is believed to contribute positively to this policy.

The framework procedures recommended in the FMP would allow management adjustments to be initiated by either Federal or State/Territories, with opportunities for the non-initiating agency to independently establish comparable regulations in a time frame suited to its own administrative or legislative procedures. The framework procedure provides the Council and RD with broad authority to make rules that may include size limits, closures, gear restrictions, and conditions for entry. This is equivalent to the authority provided the Hawaii Department of Land and Natural Resources and the Guam Division of Aquatic and Wildlife Resources under existing statutes. The measures and the framework process proposed in this plan are fully consistent with the approved CZM programs of Hawaii, Guam, and American Samoa.

The Council has received State and Territory concurrence with the CZM consistency determinations (Appendix I).

9.2 Marine Mammal Protection Act

Passage of the Marine Mammal Protection Act (MMPA) in 1972 committed the United States to long-term management and research programs to conserve and protect these animals. With few exceptions, the MMPA placed a moratorium on taking or importing marine mammals or their products into the United States. In 1976,

the Magnuson Fishery Conservation and Management Act (MFCMA) expanded U.S. control of marine mammals to include the 200-mile fishery conservation zone (FCZ).

The National Marine Fisheries Service grants or denies requests for exemptions, issues permits, carries out research and management programs, enforces the MMPA, participates in international programs, and issues rules and regulations to carry out its mission to conserve and protect marine mammals.

It is the goal of the Office of Protected Species and Habitat Conservation (NMFS) and the Marine Mammal Commission (MMC) that the incidental "take" or incidental serious injury due to fishing operations be reduced to insignificant levels approaching a zero incident level. "Taking" a species means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Towards that end the Council has established Objective 8 (Section 5.4.8): avoid the taking of protected species and minimize possible adverse modification to their habitat. The immediate action of prohibiting bottom trawl and bottom-set nets and a Federal permit requirement also provide measures of education and protection which minimizes the risk of incidental "takes". As a part of the NWHI FCZ bottomfish permit application form (Appendix A) an informational document which includes a protected species/fishing operation interaction or "take" form and a statement to be signed stating that the applicant has read and understands the applicable laws, regulations and penalties regarding the protected species of the area will be included.

Marine mammals and endangered and threatened species which reside in or have been observed in the FCZ of the western Pacific is listed in Table 9.1. None of these listed species are expected to be adversely affected by the measures proposed in this FMP. Throughout the history of commercial fishing in Hawaii, there has been no documented cases of incidental mortality of these species in the bottomfish hook-and-line fishery.

Under the general permit system, the MMPA authorizes the incidental taking of non-protected and non-endangered marine mammals by domestic and foreign fishermen during commercial fishing operations. The 1981 amendments to the MMPA added two categories of "small take" to the moratorium exception; one is for commercial fishing and the other applies to other activities such as oil and gas exploration. The MMPA, as amended, allows for the incidental but not intentional taking of small numbers of nondepleted species or stocks of marine mammals by U.S. citizens engaged in commercial fishing operations. Commercial fishermen may obtain a Certificate of Inclusion (under a General Permit) to take marine mammals that interfere with their catch. In the main Hawaiian islands, there have been occasional reports of dolphins removing bait or hooked fish from the lines of trollers and handline fishermen. Some of these fishermen have obtained a "certificate of inclusion" from the NMFS. There has been no reported "takes" of marine mammals from the NWHI by fishing vessel operations. Should any problems or "takes" occur through any bottomfishing operation interactions, the report should be investigated by the appropriate agencies. It is felt that the available information concerning these interactions is not sufficient to provide a thorough understanding of the problem. Therefore due to the infrequent nature of interactions, research by the appropriate agencies should be conducted to ascertain the need for any incidental take permit or small take

exemption. If warranted, an incidental take permit or small take exemption will then be applied for under the general permit system of the Marine Mammal Protection Act (MMPA).

The formal ESA Section 7 Biological Opinion received from the NMFS has specified conditions for re-initiation of Section 7 Consultations and has also set acceptable levels of incidental take for threatened and endangered turtle species for in the regulated FCZ bottomfish fishery for the NWHI (Table 9.1, Appendix J).

9.3 Endangered Species Act (ESA)

The ESA requires Federal agencies to use their authorities to protect, restore and enhance threatened and endangered species and their habitats. Marine mammals and endangered or threatened species which have been recorded in the FCZ are identified in Table 9.1.

A Federal agency (e.g., the Council) may not take action which is likely to jeopardize the continued existence of a species listed as threatened or endangered, except under very limited circumstances. Before undertaking an action, a Federal agency must request consultations under Section 7 of the ESA with the National Marine Fisheries Service (NMFS) or U.S. Fish and Wildlife Service (FWS), as appropriate. A Biological Opinion is then issued indicating whether the action is likely to jeopardize the continued existence of a species or will result in modification or destruction of "critical habitat" for such species and recommending adjustments to the proposed action to achieve greater protection of endangered or threatened species.

None of the cetaceans listed in Table 9.1 is expected to be affected by the measures proposed in this FMP. Sea turtles have been reported taken on occasion on longline gear. Endangered and threatened sea turtles occur throughout the FCZ and in other parts of the central and western Pacific. If taking does occur, small numbers of individuals are likely to be affected. Monk seal pups are particularly susceptible to potential entanglement in netting. A proposal for a "critical habitat designation" for the endangered Hawaiian monk seal has been published in the Federal Register. The measures proposed in this FMP, especially those pertaining to prohibiting net fishing in the FCZ, should increase protection of marine mammals and threatened or endangered species. This provision will eliminate entanglement problems and much of the potential impact on these species.

The Council has received the formal Section 7 consultations from the NMFS. Based on the available information, it has concluded that the proposed action is not likely to jeopardize any threatened or endangered species within the FMP's geographic scope. Acceptable levels of incidental take for threatened and endangered turtle species and conditions for a re-initiation of Section 7 Consultations were also set (Table 9.1, Appendix J).

TABLE 9.1

MARINE MAMMALS AND ENDANGERED AND THREATENED SPECIES RECORDED
IN THE FCZ OF THE WESTERN PACIFIC REGION

Scientific Name	Common Name	"Incidental Takes" ^{2/} Levels
* <u>Megaptera novaengliae</u>	(humpback whale)	3/
<u>Balaenoptera edeni</u>	(Bryde's whale)	4/
* <u>B. physalus</u>	(fin whale)	3/
* <u>Physeter catodon</u>	(sperm whale)	3/
<u>Orcinus orca</u>	(killer whale)	4/
<u>Pseudorca crassidens</u>	(false killer whale)	4/
<u>Steno bredanensis</u>	(rough-toothed dolphin)	4/
<u>Stenella longirostris</u>	(Hawaiian spinner dolphin)	4/
<u>S. attenuata</u>	(spotted dolphin)	4/
<u>S. caeruleoalba</u>	(striped dolphin)	4/
<u>Tursiops truncatus</u>	(bottlenosed dolphin)	4/
<u>Feresa attenuata</u>	(pygmy killer whale)	4/
<u>Kogia sp.</u>	(dwarf and pygmy sperm whale)	4/
<u>Peponocephala electra</u>	(melon-headed whale)	4/
<u>Globicephala macrorhynchus</u>	(short-finned pilot whale)	4/
<u>Grampus griseus</u>	(Risso's dolphin)	4/
<u>Ziphius cavirostris</u>	(goosebeak whale)	4/
<u>Mesoplodon densirostris</u>	(densebeak whale)	4/
* <u>Monachus schauinslandi</u>	(Hawaiian monk seal)	3/
+ <u>Chelonia mydas</u>	(green turtle) ^{1/}	15
* <u>Eretmochelys imbricata</u>	(hawksbill turtle) ^{1/}	5
* <u>Dermochelys coriacea</u>	(leatherback turtle) ^{1/}	5
+ <u>Lepidochelys olivacea</u>	(olive ridley turtle) ^{1/}	5
* <u>Diomedea albatrus</u>	(short-tailed albatross)	3/

* = endangered species

+ = threatened species

^{1/} = (Joint NMFS-FWS jurisdiction)^{2/} = Mortality on acceptable levels of "incidental takes" not to exceed two (2) animals of each species.^{3/} = Under the MMPA it is illegal to set any "incidental takes" level on species listed as depleted.^{4/} = No set level of acceptable "takes" but any interaction must be reported.

NOTE: Taking a species means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct.

The NMFS has completed a biological opinion after reviewing the revised FMP. Three major issues were identified in the preliminary NMFS review:

- Monk seals at French Frigate Shoals have been observed taking fish off hooks, and one monk seal has been observed with a bottomfish hook embedded in its lip. No mortality has been reported, but it can be inferred from the observation of a hooked monk seal and a report of a Mediterranean monk seal drown in longline gear (Sergeant et al., 1978, First International Conference on the Mediterranean Monk Seal. Rodos, Greece, May 1978. 45 p.) that the potential for incidental mortality exists. Also, a more direct conflict may evolve as monk seals learn to exploit bottomfish hook-and-line gear for food and fishermen try to protect their catch from depredation. There is no mechanism to authorize an incidental take of monk seals because they are protected under the Marine Mammal Protection Act. Also, NMFS believes that incidental mortality is likely to affect the population adversely. Fishermen should understand the potential conflicts and risks of fishing in areas where monk seals occur before entering fisheries in those areas.
- The incidental take of sea turtles is more straightforward. They apparently swim into the gear and become tangled. Some turtles are released alive and procedures exist for reviving comatose turtles. Under Section 7(b)(4) NMFS has developed an incidental take statement to authorize an acceptable level of mortality and specify the terms and conditions under which an incidental take of sea turtles may occur (Appendix J). Fishermen will need to be advised of the potential for incidental capture of sea turtles and methods of returning them to the sea without additional injury (Appendix A).
- The last issue is the need for a reporting requirement. Reports of interactions and mortality are necessary to monitor the effects of increased fishing effort on listed populations. The Council will include with the NWHI FCZ permit application form an informational document on protected species/fishing interactions and a form to be signed and returned stating that the applicant has read and understands the applicable laws, regulations, and penalties regarding the protected species of the area (Appendix A).

9.4 Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) requires that agencies evaluate the impacts of their regulation on the businesses that are affected and to consider adjustments to those regulations if necessary to avoid a significant adverse impact on a substantial number of small business entities. The Council acknowledges that virtually all of the fishermen affected by this plan would classify as "small businesses".

A formal Regulatory Flexibility Analysis has not been prepared but sections of the FMP contain discussions that would be included in a Regulatory Flexibility Analysis. Discussions on: the problems the FMP is trying to solve (Section 2.2, 2.4, 4.3, and 5.4,); the alternative approaches (Sections 6.3 and 7.0,); analysis of the impacts of each alternative (Sections 6.3 and 7.0); a description and estimate of the number of small entities in the fishery (Section 5.2.1); an analysis of the economic impact on small entities (Section 4.5.4, 5.2.2, and Appendix F); and the rationale for choosing the proposed regulatory action (Section 1.2 and 6.1) are included.

The Council believes that the General Counsel of the Department of Commerce can certify to the Small Business Administration that this proposed FMP will not have a significant adverse economic impact on a substantial number of small entities. Specific regulations implemented under the framework procedure established by the FMP could have a significant impact, and it is recommended that the RFA analytical requirements be met before each regulation is implemented by the RD under the framework procedure.

9.5 Paperwork Reduction Act

The only new paperwork requirement would be the permit application form for the NWHI fishery (see Appendix A). The NMFS will have to get OMB clearance for the permit form. Catch and effort data submission requirements and data collection programs would be continued at the State and Territory levels.

9.6 Executive Order 12291

Under this order, a Regulatory Impact Analysis is required if a proposed Federal rule is major. A major Federal rule is defined as one that will result in:

- a) An annual effect on the economy of \$100 million or more;
- b) A major increase in costs or prices for consumers, industries, Federal, State, or local government agencies, or geographical regions;
- c) Significant adverse effects on competition, employment, investment, productivity, innovation, or the ability of United States-based enterprises to compete in domestic or export markets.

There will be no major adverse impacts under the FMP requiring a Regulatory Impact Analysis immediately. However, the need for a RIA will have to be assessed each time a specific regulation is recommended for implementation by the RD under the framework procedure.

9.7 National Environmental Policy Act (NEPA)

The environmental assessment that is incorporated in the revised FMP meets the requirements of NEPA and has been accepted by the NOAA Office of Policy and Planning. Documentation for a finding of no significant environmental impact is provided in Section 8.8.

9.8 Department of the Interior Laws and Policies

The U.S. Fish and Wildlife Service (FWS) administers the Hawaiian Islands National Wildlife Refuge in the Northwestern Hawaiian Islands (NWHI) under Executive Order 1019, which established the refuge, and the National Wildlife Refuge System Administration Act, which sets forth the management objectives for all units of the National Wildlife Refuge System. There is no overlap between the boundaries of the Refuge and the boundaries of the FCZ. If the NWHI domestic fishery continues to expand without any management, there may be increased possibility for groundings or emergency landings of vessels on the Refuge islands. No FWS-managed resources are expected to be negatively affected in any way by this plan, and the plan could contribute positively through the proposed permit for bottomfishing in the FCZ of the NWHI.

The Department of the Interior has the responsibility for the administration of the Territories of Guam and American Samoa. This plan appears to be fully consistent with Department of the Interior policies.

9.9 Department of Defense

The Department of Defense administers Midway Island and several of the U.S. Possessions in the Pacific. This plan should not affect the affairs of the Defense Department in any way.

9.10 Department of Transportation

The U.S. Coast Guard, Department of Transportation, shares enforcement responsibilities with NMFS under the MFCMA. Enforcement difficulty will vary depending on the management approaches ultimately selected. Simplicity of enforcement is especially critical in the western Pacific region due to the large area of the FCZ (1.5 million square miles) and limited enforcement resources.

9.11 Department of State

Under the PMP for Seamount Groundfish, the Department of State is involved in allocations of TALFF. The plan recommends zero (0) TALFF for this fishery for the next 6 years.

10.0 PLAN ADMINISTRATION AND ENFORCEMENT

10.1 Monitoring

10.1.1 Annual Review

A. The Council shall establish and appoint the members of a Bottomfish Monitoring Team (Team) which is necessary to assist it in carrying out its functions under the MFCMA. The Team will have lead responsibility for preparing an annual report on the effectiveness of the plan in meeting its objectives. The composition of the Team will be decided by the Council. The Team will work closely with NMFS, Coast Guard, State, and Territory officials to ensure that data submission requirements and data collection programs are generating the data necessary for effectively monitoring the fishery and determining whether different management measures are necessary. The Honolulu Laboratory will be responsible for providing timely data analysis and research results on the bottomfish fishery for use by the Monitoring Team. The Team will prepare an annual report on the fishery by March 31 each year containing the following information on the previous year and comparative results for prior years to the extent data are available for each area of the FCZ and adjacent waters around the main Hawaiian Islands, Northwestern Hawaiian Islands, American Samoa, and Guam.

1. Fishery Performance Data

- a. Total landings, (commercial and recreational) by species by area per month.
- b. Estimated ex-vessel revenues by species.
- c. Number of vessels, numbers of fishing trips, days fished, landings per trip, species composition by landings, areas fished, catch by area, catch per day by area, and other indicators of performance for commercial and recreational fisheries.
- d. Biological characteristics of the landings, including size-frequency by species by area.

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 Territory Management Actions
7. Assessment of Need for Council Action
 - a. Biological conditions and trends.
 - b. Economic conditions and trends.
 - c. Social conditions and trends.
 - d. Enforcement problems and significance
 - e. Administrative problems.
 - f. State/Federal consistency.
8. Recommendations for Council Action
9. Estimated Impacts of Recommended Action

B. The criteria which warrant further investigation into potential problems are described in Section 6.2.1 (B).

10.1.2 Catch Reporting

State of Hawaii laws require a person to obtain a commercial marine fishing license prior to selling any fish caught; and all commercially licensed fishermen must file a monthly report listing all fishing trips taken during the month and all fish caught, whether any fish are sold or not (see Appendix D for samples of the State license application and catch reporting form). These data will be provided to the Council through the Honolulu Laboratory by the data sharing agreement between the HDAR and the NMFS. Recreational and subsistence fishermen are not required to obtain licenses nor to report their catches. These data may be collected through survey means.

Neither commercial, recreational, or subsistence fishermen are required to obtain fishing licenses in Guam or to report their catches. Presently, there are two principal sources of data in Guam which contain

some catch and effort information on billfish and the other management unit species: (a) commercial fish wholesalers, and (b) the offshore creel survey conducted by the Guam Division of Wildlife Resources (DAWR). The largest and oldest of the fish wholesalers is the Guam Fishermen's Cooperative (Coop) which has been collecting data on its purchases from commercial fishermen since July 1979 and submitting this information to the Honolulu Laboratory of NMFS on a voluntary basis. During 1984, two additional wholesalers started submitting their purchase data to the DAWR on a similar basis. The DAWR has conducted an intercept creel survey (sample) data on collection program for offshore (boat-based) fisheries since the 1970's. Sample catch and effort data on the management unit species can be obtained from this data base. The offshore creel survey (sample) data are expanded into island-wide estimates of catch and effort by fishing method. Non-confidential, summarized data are available through WPACFIN.

The Territory of American Samoa does not have a licensing requirement for commercial, subsistence, or recreational fishermen. Fisheries data come from the voluntary catch reports and back-up interviews with commercial fishermen to obtain catch and effort information on the management unit species. Because this data base is a result of a sampling program, the sample data are expanded to get estimates of total commercial landings of the management unit species.

The WPACFIN program will produce an annual series of summary reports (see Appendix E) which may satisfy a large part of the data needs for the annual review by the Council's Bottomfish Monitoring Team. The Council has concluded that first priority should be given to building on the previous Federal investment in WPACFIN, rather than establishing a new data reporting requirement for the Bottomfish FMP initially.

10.1.3 Ex-Vessel Monitoring

Beginning in January 1984, WPRFMC staff began daily to collect information concerning ex-vessel bottomfish transactions. The data are recorded by specific lots of fish and include the total weight, number of pieces, price per pound, collection date, and an approximate location of capture (main Hawaiian Islands or Northwestern Hawaiian Islands). The summarized data partially satisfy research needs A.1, A.2b, and A.4 (see Table 10.2).

There is size variation within lots, although it is small relative to overall levels of variation. For example, analysis of variance of 694 individually measured uku, Aprion virescens, taken from a sample of 167 lots, reveals that 91% of all weight variation was attributable to differences among lots (WPRFMC, unpublished data). (Ralston and Kawamoto, 1985).

10.1.4 NWHI Permit

The characteristics of bottomfishing operations in the FCZ of the NWHI would be documented through the NWHI permit proposed in the FMP (see Appendix A for permit application and attached protected species inclusions). The information required on the permit application would assist in addressing portions of research need No. A.2b (see Table 10.2). In addition, entry and exit of fishermen could be tracked on an annual basis, and the assignment of each permit to a particular vessel would facilitate aircraft surveillance of the NWHI by the Coast Guard.

10.2 Enforcement

Enforcement in all areas would rely initially on shoreside monitoring of commercial landings (see Appendix F.1.3). Based on the proposed management measures and the number of active participants in the fishery, NMFS effort would be approximately one man year, or about \$50,000 per year. Aircraft surveillance will be focused on the NWHI fishing grounds. No increase above current levels of aircraft surveillance (see Table 10.1) are planned.

TABLE 10.1

AIRCRAFT AND VESSEL SURVEILLANCE OF THE FCZ
OF THE WESTERN PACIFIC REGION

Aircraft Surveillance (C-130 at \$2,147 Per Hour)		
Area of the FCZ	Frequency of Coverage	Annual Costs
Main Hawaiian Islands	Bi-weekly	\$ 362,843
Northwestern Hawaiian Islands	Bi-weekly	809,419
Guam	Quarterly	373,578
American Samoa	Quarterly	287,698
TOTAL AIRCRAFT SURVEILLANCE		<u>\$1,833,538</u>

An aircraft patrol covers about 200 miles per hour, or 1,600 miles per 8-hour day. On a clear day with moderate seas, radar and visual sightings will be quite reliable within 30 miles to either side. Thus, in a day, an aircraft patrol can cover about 48,000 square miles at a cost of \$17,176. Aircraft patrols are multi-purpose, with fisheries surveillance an important but not the only purpose. Moreover, aircraft patrols are multi-fishery operations, therefore, Table 10.1 should not be interpreted, as showing Coast Guard costs under the FMP.

The gear restrictions proposed in the FMP for domestic fisheries (i.e., prohibition against the use of bottom trawl and bottom-set nets and against the use of explosives or poisons for fishing) can only practically be enforced by port inspections because at-sea enforcement resources are so severely limited. Therefore, bottomfishing vessels have to be prohibited from carrying restricted gear onboard.

The moratorium on commercial fishing with any gear-type at the Hancock Seamounts should be enforced by aircraft surveillance without an increase above the present level of coverage by the Coast Guard. If the moratorium on commercial fishing is changed in the future, the permitted gear-types will be allowed on seamount groundfish vessels.

10.3 Research Needs

The following research needs, priorities, and recommended allocation of responsibilities were established by the WPFMC Scientific and Statistical Committee (SSC):

TABLE 10.2

RESEARCH NEEDS AND PRIORITIES

Item/Priority	Responsible Agency(ies)	For Area(s)
A. Research/data needs projects which are anticipated to be on-going or one-time-continuing-into 1988, in order of decreasing priority.		
1. Monitor the size-frequency of the catch of management unit bottom-fish species, including assessment of the variation from the mean length and weight of bottom-fish marketed in lots.	NMFS GDAWR* w/NMFS analysis ASOMR* w/NMFS analysis	Hawaii Guam A. Samoa

TABLE 10.2

RESEARCH NEEDS AND PRIORITIES
(Continued)

Item/Priority	Responsible Agency(ies)	For Area(s)
2a. Create/maintain time sequence data of corresponding bottomfish catch and effort data, at least for the most heavily-fished species and for the commercial fishery.	HDAR* w/NMFS analysis GDAWR w/NMFS analysis ASOMR w/NMFS analysis (Good effort data are crucial; if state/territorial reporting systems have not improved effort reporting to an acceptable (useful) level of sensitivity and timeliness by a specified date, a new, Federal data program for such data should be created.)	Hawaii Guam A. Samoa
2b. Dockside and market observation and fishermen-contact interviews that produce data to support the following aspects of bottomfish fisheries:	NMFS	
- commercial landings, species composition, pieces, ex-vessel revenue of fresh fish component of catch	WPRFMC/NMFS/HDAR	Hawaii
- shifts in types of gear	NMFS (using NWHI permit)	NWHI
- frozen fish component of catch	NMFS (using NWHI permit)	NWHI
- entry/exit of fishermen	NMFS (using NWHI permit)	NWHI
2c. A data collection program that makes use of U.S.C.G. surveillance flights to provide a sample of the distribution of U.S. fishing vessels in the FCZ of the NWHI.	U.S.C.G./NMFS	NWHI only

TABLE 10.2

RESEARCH NEEDS AND PRIORITIES
(Continued)

Item/Priority	Responsible Agency(ies)	For Area(s)
3. Reproductive studies of heavily-fished bottomfish species to determine size at first reproduction, spawning season, pattern of egg release, and fecundity as a function of size.	NMFS	All areas
4. Document trends in Hawaii bottomfish catch rates by a selected number of commercial boats; relate the trends to changes in fishing power resulting from technological innovations.	WPRFMC/contractor/NMFS/HDAR	Hawaii
5. Size and value of non-market (recreational) bottomfish fishery.	NMFS WPRFMC/contractor	Hawaii Guam
6. Age/size relationships for heavily-fished bottomfish species.	NMFS	Hawaii/Guam
7. Effect of cultural influences on commercial fish production and distribution in the American Samoa deepsea fishery.	WPRFMC/contractor	Samoa
8.** Derive estimates of stock size and turnover rate of groundfish populations on seamount summits and slopes.	NMFS	Hawaii
9.** Recruitment studies of bottomfish species.	NMFS	Hawaii

TABLE 10.2

RESEARCH NEEDS AND PRIORITIES
(Continued)

Item/Priority	Responsible Agency(ies)	For Area(s)
B. Research/data needs projects which are anticipated to be completed by 1988, in order of decreasing priority.		
1. Time series trip cost and earnings data for domestic fishing fleets.	NMFS	Hawaii only
2. Current description of domestic fishing fleets.	NMFS	All areas
3. Current description of commercial distribution of fishery products.	NMFS	Hawaii (and Guam)

- * GDAWR = Guam Division of Aquatic and Wildlife Resources
ASOMR = American Samoa Office of Marine Resources
HDAR = Hawaii Division of Aquatic Resources
WPFMC = Western Pacific Regional Fishery Management Council
NMFS = National Marine Fisheries Service

** Considerably lower priority and longer term efforts

11.0 RULES AND REGULATIONS

CODE OF FEDERAL REGULATIONS -- TITLE 50

PART 683 -- WESTERN PACIFIC BOTTOMFISH AND SEAMOUNT GROUND FISH FISHERIES

SUBPART A -- GENERAL PROVISIONS

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SUBPART A -- GENERAL PROVISIONS

683.1 Purpose and Scope

- (a) The regulations in this part govern fishing for bottomfish and seamount groundfish by fishing vessels of the United States in the fishery conservation zone (FCZ) off the coasts of Hawaii, American Samoa, and Guam.
- (b) Regulations governing fishing for bottomfish and seamount groundfish by fishing vessels other than vessels of the United States are published at 50 CFR Part 611.
- (c) These regulations implement the Fishery Management Plan for the Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region (FMP) developed by the Western Pacific Regional Fishery Management Council under the Magnuson Fishery Conservation and Management Act (Magnuson Act).

683.2 Definitions

In addition to the definitions in the Magnuson Act, the terms used in this part have the following meanings (some definitions in the Magnuson Act have been repeated here to aid understanding of the regulations):

Administrator means the Administrator of the National Oceanic and Atmospheric Administration (NOAA), or a designee.

Authorized officer means:

- (a) Any commissioned, warrant, ^{or} petty officer of the U.S. Coast Guard.
- (b) Any special agent of the National Marine Fisheries Service.
- (c) Any officer designated by the head of any Federal or State agency which has entered into an agreement with the Secretary and the Commandant of the U.S. Coast Guard to enforce the provisions of the Magnuson Act; or
- (d) Any U.S. Coast Guard personnel accompanying and acting under the direction of any person described in paragraph (a) of this definition.

Bottom fish means the following species managed by the FMP:

Common Name	Local Name	Scientific Name
SNAPPERS:		
Silver jaw jobfish	lehi (H) palu-gutusiliwa (S)	<u>Aphareus rutilans</u>
Gray jobfish	uku (H) asoama (S)	<u>Aprion virescens</u>
Squirrelfish snapper	ehu (H) palu-malau (S)	<u>Etelis carbunculus</u>
Longtail snapper	onaga, ula'ula (H) palu-loa (S)	<u>Etelis'coruscans</u>
Blue stripe snapper	ta'ape (H) savane (S)	<u>Lutjanus kasmira</u>
Yellowtail snapper	palu-i' usama (S) yellowtail kalekale (G)	<u>Pristipomoides auricilla</u>
Pink snapper	opakapaka (H) palu-'ena'ena (S) gadao (G)	<u>Pristipomoides filamentosus</u>
Yelloweye snapper	palusina (S) yelloweye opakapaka (G)	<u>Pristipomoides flavipinnus</u>
Snapper	kalekale (H)	<u>Pristipomoides sieboldii</u>
Snapper	gindai (H,G) palu-sega (S)	<u>Pristipomoides zonatus</u>
<hr/>		
JACKS		
Giant trevally	white ulua (H) tarakito (G)	<u>Caranx ignobilis</u>
Black jack	black ulua (H) tarakito (G) tafauli (S)	<u>Caranx lugubris</u>
Thick lipped trevally	pig ulua (H) butaguchi (H)	<u>Pseudocaranx dentex</u>
Amberjack	kahala (H)	<u>Seriola dumerili</u>

Bottomfish means the following species managed by the FMP (Continued):

Common Name	Local Name	Scientific Name
<u>GROUPERS:</u>		
Blacktip grouper	fausi (S) gadau (G)	<u>Epinephelus fasciatus</u>
Sea bass	hapu'upu'u (H)	<u>Epinephelus quernus</u>
Lunartail grouper	papa (S)	<u>Variola louti</u>

<u>EMPEROR FISHES:</u>		
Ambon emperor	filoa-gutumumu (S)	<u>Lethrinus amboinensis</u>
Redgill emperor	filoa-pa'o'omumu (S) mafuti (G)	<u>Lethrinus rubrioperculatus</u>

NOTES: G = Guam
H = Hawaii
S = American Samoa

Fishery conservation zone (FCZ) means that area adjacent to the United States which, except where modified to accommodate international boundaries, encompasses all waters from the seaward boundary of each of the coastal states to a line each point of which is 200 nautical miles from the baseline from which the territorial sea of the United States is measured.

Fishery management area means the fishery conservation zone off the coasts of Hawaii, American Samoa and Guam.

Fishing means:

- (a) The catching, taking, or harvesting of fish;
- (b) The attempted catching, taking or harvesting of fish;
- (c) Any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or
- (d) Any operations at sea in support of, or in preparation for, any activity described above.

This term does not include any scientific research activity which is conducted by a scientific research vessel.

Fishing gear:

- (a) Bottom trawl means a trawl in which the otter boards or the footrope of the net are in contact with the seabed.
- (b) Gillnet means a rectangular net with one or more layers of mesh which is set vertically in the water.
- (c) Hook-and-line means one or more hooks attached to one or more lines.
- (d) Set net means a stationary, buoyed, and anchored gill net.
- (e) Trawl net means a cone or funnel-shaped net which is towed through the water by one or more vessels.

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 vessel means any vessel, boat, ship, or other craft which is used for, equipped to be used for, or of a type which is normally used for: (a) fishing; or (b) aiding or assisting one or more vessels at sea in the performance of any activity relating to fishing, including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing.

Fishing year means the year beginning at 0001 local time on January 1 and ending at 2400 local time on December 31.

Incidental catch or incidental species means species caught while fishing for the primary purpose of catching a different species.

Land or landing means to begin offloading any fish, to arrive in port with the intention of offloading any fish, or to cause any fish to be offloaded.

Magnuson Act means the Magnuson Fishery Conservation and Management Act, 16 U.S.C. 1801 et seq., as amended.

Maximum sustainable yield (MSY) means an average over a reasonable length of time of the largest catch which can be taken continuously from a stock.

Official number means the documentation number issued by the U.S. Coast Guard or the certificate number issued by a State or by the U.S. Coast Guard of undocumented vessels.

Operator, with respect to any vessel, means the master or other individual on board and in charge of that vessel.

Owner, with respect to any vessel, means:

- (a) Any person who owns that vessel in whole or in part;
- (b) Any charterer of the vessel, whether bareboat, time, or voyage;
- (c) Any person who acts in the capacity of a charterer including but not limited to parties to a management agreement, operating agreement, or any similar agreement that bestows control over the destination, function, or operation of the vessel; or
- (d) Any agent designated as such by a person described in paragraph (a), (b), or (c) of this definition.

Person means any individual (whether or not a citizen or national of the United States), any corporation, partnership, association, or other entity (whether or not organized or existing under the laws of any State), and any Federal, State, local or foreign government or any entity of any such government.

Regional Director means the Southwest Regional Director, National Marine Fisheries Service, 300 South Ferry Street, Terminal Island, California 90731, or a designee.

Seamount groundfish means the following species managed by the FMP:

<u>Common Name</u>	<u>Scientific Name</u>
Armorhead	<u>Pseudopentaceros wheeleri</u>
Alfonsins	<u>Beryx splendens</u>
Raftfishes	<u>Hyperoglyphe japonica</u>

Secretary means the Secretary of Commerce or the person(s) to whom appropriate authority has been delegated.

State means the State of Hawaii, the Territory of American Samoa and the Territory of Guam.

Vessels of the United States means (a) a vessel documented or numbered by the U.S. Coast Guard under U.S. law; or (b) a vessel, under five net tons, which is registered under the laws of any State.

683.3 Relation to State Laws

This part recognizes that any State law which pertains to vessels registered under the laws of that State while in the fishery management area, and which is consistent with the FMP including any State landing law, shall continue in effect with respect to fishing activities regulated under this part.

683.4 Reporting

This part recognizes that catch and effort data necessary for implementing the FMP are collected by the State of Hawaii, American Samoa, and Guam under existing State data collection programs. No additional Federal reports are required of fishermen or processors as long as the data collection and reporting systems operated by the State agencies continue to provide the Secretary with statistical information adequate for management.

683.5 Management Subareas

- (a) The 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 FCZ of the Hawaiian Islands Archipelago lying to the east of 161° 20' W. longitude will include middle bank with MHI.
 - (2) Northwestern Hawaiian Islands means the FCZ of the Hawaiian Islands Archipelago lying to the west of 161° 20' W. longitude.
 - (3) Hancock Seamounts means that portion of the FCZ in the Northwestern Hawaiian Islands west of 180° 00' W. longitude and north of 28° 00' N. latitude.
 - (4) Guam means the FCZ of the Territory of Guam.
 - (5) American Samoa means the FCZ 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").

Midway Island is a possession of the United States. However, for the purpose of regulations issued under this part and the regulations which apply to the Northwestern Hawaiian Islands, Midway Island shall be treated as if it is a part of the State of Hawaii.

- (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 shall extend to those points which are equidistant between Guam and the island of Rota in the Commonwealth of the Northern Mariana Islands.

683.6 General Prohibitions

It is unlawful for any person:

- (a) To possess, have custody or control of, ship or transport, offer for sale, sell, purchase, import or export any bottomfish or seamount groundfish taken, retained, or landed in violation of the Magnuson Act, this part, or any other regulation promulgated under the Magnuson Act;
- (b) To refuse to allow an authorized officer to board a fishing vessel subject to such person's control for purposes of conducting any search or inspection in connection with the enforcement of the Magnuson Act, this part, or any other regulation promulgated under the Magnuson Act;
- (c) To forcibly assault, resist, oppose, impede, intimidate, or interfere with any authorized officer in the conduct of any inspection or search described in paragraph (b) of this section;
- (d) To resist a lawful arrest for any act prohibited by this part;
- (e) To interfere with, delay, or prevent, by any means, the apprehension or arrest of another person, with the knowledge that such other person has committed any act prohibited by this part;
- (f) To interfere with, obstruct, delay, or prevent by any means a lawful investigation or search conducted in the process of enforcing the Magnuson Act;
- (g) To transfer, or attempt to transfer, directly or indirectly, any U.S.-harvested bottomfish or seamount groundfish to any foreign fishing vessel within the FCZ, unless the foreign vessel has been issued a permit which authorizes the receipt of U.S.-harvested fish of the species being transferred;
- (h) To fail to comply immediately with enforcement and boarding procedures specified in 683.7;

- (i) To fish for bottomfish or seamount groundfish in violation of any terms or conditions attached to an EFP issued under 683.9;
- (j) To fish for bottomfish or seamount groundfish using gear prohibited under 683.22 or under an EFP issued under 683.9.
- (k) To violate any other provision of this part, the Magnuson Act, any notice issued under Subpart B of this part, or any other regulation or permit promulgated under the Magnuson Act.

683.7 Enforcement

- (a) General. The operator of, or any other person aboard, any fishing vessel subject to this part must immediately comply with instructions and signals issued by an authorized officer to stop the vessel and with instructions to facilitate safe boarding and inspection of the vessel, its gear, equipment, fishing record (where applicable), and catch for purposes of enforcing the Magnuson Act and this part.
- (b) Communications:
 - (1) Upon being approached by a U.S. Coast Guard vessel or aircraft, or other vessel or aircraft with an authorized officer aboard, the operator of a fishing vessel must be alert for communications conveying enforcement instructions.
 - (2) If the size of the vessel and the wind, sea, and visibility conditions allow, loudhailer is the preferred method for communicating between vessels. If use of a loudhailer is not practicable, and for communications with an aircraft, VHF-FM or high frequency radio-telephone will be employed. Hand signals, placards, or voice may be employed by an authorized officer and message blocks may be dropped from an aircraft.
 - (3) If other communications are not practicable, visual signals may be transmitted by flashing light directed at the vessel signaled. Coast Guard units will normally use the flashing light signal "L" as the signal to stop.
 - (4) Failure of a vessel's operator to stop his vessel when directed to do so by an authorized officer using loudhailer, radio-telephone, flashing light signal, or other means constitutes prima facie evidence of the offense of refusal to permit an authorized officer to board.

- (5) The operator of a vessel who does not understand a signal from an enforcement unit and who is unable to obtain clarification by loudhailer or radio-telephone must consider the signal to be a command to stop the vessel instantly.

(c) Boarding. The operator of a vessel directed to stop must:

- (1) Guard Channel 16, VHF-FM if so equipped;
- (2) Stop immediately and lay to or maneuver in such a way as to allow the authorized officer and his party to come aboard;
- (3) Except for those vessels with a freeboard of four feet or less, provide a safe ladder, if needed, for the authorized officer and his party to come aboard;
- (4) When necessary to facilitate the boarding or when requested by an authorized officer, provide a manrope or safety line, and illumination for the ladder; and
- (5) Take such other actions as necessary to facilitate boarding and to ensure the safety of the authorized officer and the boarding party.

(d) Signals. The following signals, extracted from the International Code of Signals, may be sent by flashing light by an enforcement unit when conditions do not allow communications by loudhailer or radio-telephone. Knowledge of these signals by vessel operators is not required. However, knowledge of these signals and appropriate action by a vessel operator may preclude the necessity of sending the signal "L" and the necessity for the vessel to stop instantly.

- (1) "AA" repeated (.-/.-)* is the call to an unknown station. The operator of the signaled vessel should respond by identifying the vessel by radio-telephone or by illuminating the vessel's identification.
- (2) "RY-CY" (.-./-.-/-.-./-.-)* means "you should proceed at slow speed, a boat is coming to you". This signal is normally employed when conditions allow an enforcement boarding without the necessity of the vessel being boarded coming to a complete stop, or, in some cases, without retrieval of fishing gear which may be in water.
- (3) "SQ3" (.../-.-/-.-.-)* means "you should stop or heave to; I am going to board you".

(4) "L" (.-.-.)^{*} means "you should stop your vessel instantly".

^{*}Period (.) means a short flash of light.
Dash (-) means a long flash of light.

683.8 Penalties

Any person or fishing vessel found to be in violation of this part will be subject to the civil and criminal penalty provisions and forfeiture provisions prescribed in the Magnuson Act, and 50 CFR part 620 (Citations), 50 CFR Part 621 and 15 CFR Part 904 (Civil Procedures) and other applicable laws.

683.9 Experimental Fishing Permit

- (a) General. The Secretary may authorize, for limited experimental purposes, the direct or incidental harvest of bottomfish or seamount groundfish managed by the FMP which would otherwise be prohibited by this part. No experimental fishing may be conducted unless authorized by an experimental fishing permit (EFP) issued by the Secretary in accordance with the criteria and procedures specified in this section. EFP's will be issued without charge.
- (b) Application. An applicant for an EFP shall submit to the Regional Director at least 60 days before the desired effective 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 for 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 master;
 - (iii) U.S. Coast Guard documentation, State license, or registration number;
 - (iv) Home port;
 - (v) Length of vessel;
 - (vi) Net tonnage; and
 - (vii) Gross tonnage.
- (6) A description of the species (directed and incidental) to be harvested under the EFP and the amount(s) of such harvest necessary to conduct the experiment;
 - (7) For each vessel covered by the EFP, the approximate time(s) and place(s) fishing will take place, and the type, size, and amount of gear to be used; and
 - (8) The signature of the applicant.

The Secretary 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.

Approval by Office of Management and Budget is required, under 44 U.S.C. 3506 (c) (5).

(c) Issuance

- (1) If an application contains all of the required information, the Secretary 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 Secretary will also forward copies of the application to the Western Pacific Regional Fishery Management Council, the U.S. Coast Guard, 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 which, without the EFP, would prohibit the proposed activity; and

(iii) Biological information relevant to the proposal.

(2) At a Western Pacific Regional Fishery Management Council meeting following receipt of a properly completed application, the Secretary will consult with the Western Pacific Regional Fishery Management 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 (c) (2) of this section, or as soon as practicable thereafter, the Secretary shall 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 had made false statements as to any material fact, in connection with his or her application; or
- (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; or
- (iii) Issuance of the EFP would inequitably allocate fishing privileges among domestic fishermen or would have economic allocation as its sole purpose; or
- (iv) Activities to be conducted under the EFP would be inconsistent with the intent of this section or the management objectives of the FMP; or
- (v) The applicant has failed to demonstrate a valid jurisdiction for the permit; or
- (vi) The activity proposed under the EFP would create a significant enforcement problem.

- (4) The decision of the Secretary to grant or deny an EFP is final and unappealable. If the permit is granted, the Secretary will publish a notice in the FEDERAL REGISTER describing the experimental fishing to be conducted under the EFP. The Secretary 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 which 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 time(s) and place(s) 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 operated under an EFP;
 - (vi) Data reporting requirements; and
 - (vii) Such other conditions as may be necessary to assure compliance with the purposes of the EFP consistent with the objectives of the FMP.
- (d) Duration. Unless otherwise specified in the EFP or a superseding notice or regulation, an EFP is effective for no longer than one year unless revoked, suspended, or modified. EFP's may be renewed following the application procedures in this section.
- (e) Alteration. Any permit that has been altered, erased, or mutilated is invalid.
- (f) Transfer. EFP's issued under this part are not transferable or assignable. An EFP is valid only for the vessel(s) for which it is issued.
- (g) Inspection. Any EFP issued under 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.
- (h) Sanctions. Failure of the holder of an EFP to comply with the terms and conditions of an EFP, a notice issued under Subpart B of this part, any other applicable provision of this part, the Magnuson Act, or any other regulation promulgated thereunder,

shall be 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, or 50 CFR part 621.

SUBPART B -- MANAGEMENT MEASURES

683.21 Permit Requirement for the Northwestern Hawaiian Islands (NWHI)

- (a) General. Any vessel of the United States engaged in commercial fishing for bottomfish or seamount groundfish in the NWHI must have a permit issued under this section.
- (b) Applications.
 - (1) An application for a permit under this section must be submitted to the Regional Director by the vessel owner or operator at least 15 days before the date on which the applicant desires to have the permit made effective.
 - (2) Each application must be submitted on an appropriate form which may be obtained from the Regional Director. Each application must be signed by the vessel owner or operator and contain the following information:
 - (i) The applicant's name;
 - (ii) The owner's name, mailing address, and telephone number;
 - (iii) The operator's name, mailing address, and telephone number;
 - (iv) The name of the vessel;
 - (v) The vessel's official number;
 - (vi) The radio call sign of the vessel;
 - (vii) The home port of the vessel;
 - (viii) Gross registered tons;
 - (ix) Registered length of vessel;
 - (x) Beam of vessel;
 - (xi) Fuel capacity;
 - (xii) Average cruising speed;
 - (xiii) Maximum range of vessel;

- (xiv) Horsepower;
- (xv) Purchase price of vessel;
- (xvi) Purchase date of vessel;
- (xvii) Age of vessel;
- (xviii) Vessel fish hold capacity;
- (xix) Type of refrigeration capacity;
- (xx) Type and number of fishing gear;
- (xxi) Whether the application is for a new permit or a renewal;
- (xxii) Number and expiration date of any prior permit for the vessel issued under this part.

(c) Fees. No fee is required for a permit issued under this section.

(d) Change in Application Information. Any change in the information specified in paragraph (b) of this section must be reported to the Regional Director ten days before the effective date of the change.

(e) Issuance.

- (1) Within 15 days after receipt of a properly completed application, the Regional Director will determine whether to issue a permit.
- (2) If an incomplete or improperly completed permit application is filed, the Regional Director will notify the applicant in writing of the deficiency in the application. If the applicant fails to correct the deficiency within 30 days following the date of notification, the application will be considered abandoned.
- (3) Permits issued under this section will be accompanied by an informational package advising the permit holder of the applicable laws and regulations regarding threatened and endangered species in the NWHI. Permit holders are required to report any incidental take or fisheries interaction with protected species on a form provided for that purpose.

(f) Expiration. Permits issued under this section expire on June 30 following issuance of the permit.

- (g) Renewal. An application for renewal of a permit must be submitted to the Regional Director in the same manner as described in paragraph (b) of this section.
- (h) Alteration. Any permit that has been substantially altered, erased, or mutilated is invalid.
- (i) Replacement. Permits may be issued to replace lost or mutilated permits. an application for a replacement permit is not considered a new application.
- (j) Transfer. Permits issued under this section are not transferable or assignable to other persons. A permit is valid only for the vessel for which it is issued.
- (k) Display. Any permit issued under this section must be on board the vessel at all times while the vessel is still fishing for bottomfish or seamount groundfish in the NWHI. Any permit issued under this section must be displayed for inspection upon request of any Authorized Officer.
- (l) Sanctions. Procedures governing permit sanctions and denials are found at Subpart D of 15 CFR Part 904.

683.22 Gear Restrictions

- (a) Bottom trawls and bottom set gillnets. Fishing for bottomfish and seamount groundfish with bottom trawls and bottom set gillnets is prohibited.
- (b) 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.

683.23 Fishing Moratorium on Hancock Seamounts

Fishing for bottomfish and seamount groundfish on the Hancock Seamounts is prohibited until _____ 1992.

683.24 Framework for Regulatory Adjustments

(a) Annual Reports. By March 31 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. Indicator criteria include:
 - (i) Mean size of catch of any species in any area is pre-reproductive;
 - (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% or more) in bottomfish CPUE 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 landing 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 NWHI.

(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 of impacts 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:
 - (i) Catch limits;
 - (ii) Size limits;
 - (iii) Closures;
 - (iv) Effort limitations;
 - (v) Access limitations (for NWHI only);
 - (vi) 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 thinks that management action should be considered, it will make specific recommendations to the NMFS Regional Director after taking the following steps:
 - (i) Request and consider the views of the SSC and bottomfish advisory panel; and

- (ii) Obtain public comments at a public hearing.
- (2) The Regional Director will consider the Council's recommendation and accompanying data, and if (s)he concurs with the Council's recommendation, will propose regulations to carry out the action. If the Regional Director rejects the Council's proposed action, a written explanation for the denial shall be provided to the Council within two weeks of the decision.
- (3) The Council may appeal denial by writing to the Assistant Administrator for Fisheries, who must respond in writing within 30 days.
- (4) The Regional Director and the Assistant Administrator for Fisheries will make their decisions in accordance with the Magnuson Act, other applicable law, and the FMP.
- (5) To minimize conflicts between the Federal and State management systems, the Council will use the procedures in the subsection 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 (limited to NWHI only)

- (1) If access limitation is proposed for adoption or subsequent modification through the process described in this subsection, 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 using the fishery to engage in other fisheries; cultural and social framework relevant to the fishery; and any other relevant considerations;
 - (ii) Public hearings held specifically addressing the limited access proposal(s);
 - (iii) Creation in the limited access limitation system of a specific advisory subpanel of persons experienced in the Hawaii fishing industry (for Hawaii measures) to advise the Council and the Regional Director on administrative decisions; and

- (iv) Council recommendation to the Regional Director must be approved by a two-thirds majority of the voting members.
- (2) If prior participation in the fishery is used as a factor in any access limitation system recommended by the Council, August 7, 1985 is the date selected by the Council as the date to be used.

683.25 Scientific Research

Nothing in this part is intended to inhibit or prevent any scientific research which is conducted in the fishery management area by a scientific research vessel. The Secretary will acknowledge notification of scientific research involving bottomfish and seamount groundfish and conducted by a scientific research vessel by issuing to the operator or master of that vessel a letter of acknowledgement, containing information on the purpose and scope (locations and schedules) of the activities. The Secretary will transmit copies of such letters to the Western Pacific Regional Fishery Management Council, and to State and Federal administrative and enforcement agencies, to ensure that all concerned parties are aware of the research activities.

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1. The first part of the document is a letter from the President of the United States to the Congress, dated January 1, 1861. It is a very important document, as it sets out the policy of the new administration.

2. The second part of the document is a report from the Secretary of the Treasury, dated January 1, 1861. It contains a detailed account of the financial state of the country.

3. The third part of the document is a report from the Secretary of the Interior, dated January 1, 1861. It contains a detailed account of the state of the public lands.

4. The fourth part of the document is a report from the Secretary of the War, dated January 1, 1861. It contains a detailed account of the military forces of the country.

5. The fifth part of the document is a report from the Secretary of the Navy, dated January 1, 1861. It contains a detailed account of the naval forces of the country.

6. The sixth part of the document is a report from the Secretary of the State, dated January 1, 1861. It contains a detailed account of the foreign relations of the country.

7. The seventh part of the document is a report from the Secretary of the Education, dated January 1, 1861. It contains a detailed account of the state of the public schools.

8. The eighth part of the document is a report from the Secretary of the Agriculture, dated January 1, 1861. It contains a detailed account of the state of the agriculture of the country.

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14. The fourteenth part of the document is a report from the Secretary of the Public Lands, dated January 1, 1861. It contains a detailed account of the state of the public lands.

SUMMARY OF BOTTOMFISH FISHING REGULATIONS and RECENT FISHERY STATISTICS

WESTERN PACIFIC

American Samoa



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Northern Mariana Islands



Calistro Falig, Acting Chief
Division of Fish & Wildlife
Department of Natural Resources
Saipan, MP 96950

Western Pacific Region



Western Pacific Regional Fishery
Management Council
1164 Bishop Street, Suite 1405
Honolulu, HI 96813

AMERICAN SAMOA



Territorial Regulations

- No taking with explosives, poisons or electrical shocking devices
- Fish traps may not exceed 6 ft in any dimension
- Permit required for commercial fishing
- Seafood dealers must submit receipts of fish purchases

Federal Regulations

- No taking with explosives, poisons, trawl nets or bottom set gillnets

1993 Fishery Status

1993 total estimated bottomfish landings were 16,800 lb. Catch composition included snappers, emperors, groupers and jacks. Some 23 commercial vessels made 95 trips, catching about 16,000 lb worth \$29,000. Average combined 1993 price was \$1.81.

Bottomfish and Seamount Groundfish

GUAM



Territorial Regulations

- No taking with explosives, poisons or electrical shocking devices
- No taking with gear which may damage fish externally

Federal Regulations

- No taking with explosives, poisons, trawl nets or bottom-set gillnets

1993 Fishery Status

1993 total estimated harvest was 78,300 lb. Some 271 boats made 6265 trips. 1993 commercial landings of 10,125 lb were worth about \$29,000 ex-vessel. Catch composition included snappers, jacks, emperors and groupers. 1993 average price was \$2.90/lb.

Bottomfish and Seamount Groundfish

HAWAII



State Regulations

- License and monthly catch reports required for commercial harvest
- No sale less than one pound for opakapaka, onaga, uku and ulua
- No taking with explosives, poisons or electrical shocking devices
- Fish traps not to exceed 10 ft x 6 ft x 6 ft
- Trap minimum mesh size 2 in x 1 in (non-conforming traps may be used until 7/94 if registered by 10/89)

Federal Regulations

- No taking with explosives, poisons, trawl nets or bottom-set gillnets

Northwestern Hawaiian Islands only:

- Annual limited access permit required for Ho'omalau Zone (west of 165° W). Permit required for Mau Zone (161° 20' W to 165° W), and holders of Ho'omalau Zone limited access permits may not fish in Mau Zone.
- State of Hawaii catch report required
- Vessel must notify U.S. Coast Guard 24 hours before landing bottomfish caught in the Ho'omalau Zone
- Attendance at protected-species seminar required
- Vessel must carry observer in certain areas if requested by NMFS
- Control date of 17 Dec 1991 for Mau Zone may be used to limit entry
- No fishing for groundfish on Hancock Seamounts until August 1998

Bottomfish and Seamount Groundfish

1993 Hawaii Fishery Status

Main Hawaiian Islands

1993 commercial landings were 348,000 lb. Recreational landings are thought to be significant. Species catch composition included snappers, groupers and jacks. Over 1000 commercial, semi-commercial and recreational fishermen were suspected to have sold bottomfish in Honolulu in 1993. The average combined price was \$3.29/lb.

Northwestern Hawaiian Islands

1993 commercial landings were 385,000 lb. Species catch composition included snappers, groupers and jacks. Twelve vessels reported fishing in the NWHI, four in the limited-access Ho'omalu Zone and eight in the qualifying Mau Zone. These boats made 106 trips. 1993 average price was \$3.02/lb.

Total 1993 ex-vessel revenues from bottomfish sales combined from the Northwestern and main Hawaiian Islands were about \$2.3 million.

Bottomfish and Seamount Groundfish

NORTHERN MARIANA ISLANDS



Commonwealth Regulations

- No taking with explosives, poisons or electrical shocking devices
- Size limits for several species

Federal Regulations

- No taking with explosives, poisons, trawl nets or bottom set gillnets

1993 Fishery Status

1993 commercial landings of 14,800 lb were worth about \$37,000 ex-vessel. Species composition included snappers, emporers, groupers and jacks. Bottomfish were taken during multi-species (pelagic, bottomfish and reef fish) trips. About 20 vessels made 178 trips. 1993 average price was \$2.53/lb.

Please note: This summary is provided as a quick reference; it does not contain all fishery requirements. The public is advised that requirements may change, and that any discrepancy between this summary, and the Code of Federal Regulations and statutes and rules of the territories, state and commonwealth will be resolved in favor of the latter.

For more information:

Territory of American Samoa

Regulations:

Department of Marine and Wildlife Resources

Tel: (684) 633-4456

Fax: (684) 633-5944

Enforcement:

Department of Public Safety

Tel: (684) 633-1111

Fax: (684) 633-5111

Territory of Guam

Regulations and Enforcement:

Division of Aquatic and Wildlife Resources

Tel: (671) 734-3944

Fax: (671) 734-6570

Enforcement:

Customs and Quarantine Division

Tel: (671) 646-5841

Fax: (671) 646-7242

State of Hawaii

Regulations:

Division of Aquatic Resources

Tel: (808) 587-0102

Fax: (808) 587-0115

Enforcement:

Division of Conservation and Resources

Enforcement

Tel: (808) 587-0866

Fax: (808) 587-0080

Commonwealth of the Northern Mariana Islands

Regulations:

Division of Fish and Wildlife

Tel: (670) 322-9729

Fax: (670) 322-3386

Enforcement:

Department of Public Safety

Tel: (670) 234-6823

Fax: (670) 234-8531

United States of America (Federal)

Regulations:

Pacific Area Office

National Marine Fisheries Service

Tel: (808) 955-8831

Fax: (808) 949-7400

Western Pacific Regional Fishery

Management Council

Tel: (808) 541-1974

Fax: (808) 526-0824

Enforcement:

Law Enforcement Branch

National Marine Fisheries Service

Tel: (808) 541-2727

Fax: (808) 541-3166

Law Enforcement Branch

U.S. Coast Guard

Tel: (808) 541-2300

Fax: (808) 541-2036

The Western Pacific Regional Fishery Management Council is authorized by the Magnuson Fishery Conservation and Management Act of 1976 (P.L. 94-265)

APPENDIX A

**FISHING PERMIT APPLICATION
TO FISH IN THE NORTHWESTERN HAWAIIAN ISLANDS,
PROTECTED SPECIES INFORMATION AND
INCIDENTAL "TAKE" FORM**

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

FISHING PERMIT APPLICATION
TO FISH FOR BOTTOMFISH
IN THE NORTHWESTERN HAWAIIAN ISLANDS

APPENDIX - A

Date Application Received

Permit Number Assigned

(APPLICANT INFORMATION - PLEASE PRINT)

(1) Name of Applicant (Last, First, Middle)		
(2) Name of Vessel Owner (Last, First, Middle)		Telephone Number
(3) Mailing Address of Vessel Owner	City and State	Zip Code
(4) Operator's Name (Last, First, Middle)		Telephone Number
(5) Mailing Address of Operator	City and State	Zip Code

(PERMIT INFORMATION - PLEASE PRINT)

(6) Type of Application: a. New Permit - <input type="checkbox"/> b. Renewal Permit - <input type="checkbox"/>	(7) Prior Permit Number:	(8) Expiration Date of Permit:
--	--------------------------	--------------------------------

(VESSEL INFORMATION - PLEASE PRINT)

(9) Vessel Name:	(10) Official Number:	(11) Radio Call Sign:	(12) Home Port:
(13) Gross Registered Tons:	(14) Registered Length of Vessel:	(15) Beam of Vessel:	(16) Fuel Capacity
(17) Average Cruising Speed:	(18) Maximum Range of Vessel:	(19) Horsepower:	(20) Purchase Price of Vessel:
(21) Purchase Date of Vessel:		(22) Age of Vessel:	

(FISHING INFORMATION - PLEASE PRINT)

(23) Vessel Fish Hold Capacity: (IN TONS)	(24) Type of Refrigeration Capacity: (IN TONS)		
	a. Ice	c. Plate Freeze	
	b. On Board Ice Plant	d. Blast Freeze	
		e. Other (specify):	
(25) Type and Number of Fishing Gear:	a. Handline	c. Bottom longline	
	b. Traps	d. Other (specify):	

I have read and understand the attached restrictions and conditions regarding protected species in the Northwestern Hawaiian Islands.

APPLICANT'S SIGNATURE:
(owner/operator)

DATE:

SUBMIT THIS COPY TO THE REGIONAL DIRECTOR

RESTRICTIONS AND CONDITIONS REGARDING THE PROTECTED SPECIES IN THE NORTHWESTERN HAWAIIAN ISLANDS

The Northwestern Hawaiian Islands (NWHI) are the only home of the Hawaiian monk seal. About 1300 to 1400 of these mammals inhabit the chain from Nihoa Island to Kure Atoll. Hawaiian monk seals have survived and remained virtually unchanged for 15 million years, but in the last 100 years have been reduced in numbers due to disturbance by man.

Monk seals sometimes steal fish from lines in the NWHI. This behavior can be expected to continue and increase as fishing in the NWHI expands. Because monk seals are protected as an endangered species under Federal law, it is illegal to "harass" them. This means you cannot throw firecrackers at them, shoot them, or disturb them in any way. While bait stealing is not expected to be a major problem, you may occasionally become quite aggravated by a hungry monk seal. Small losses may be thought of as part of the overall cost of fishing in the NWHI.

Sea turtles, also protected species under Federal and State law, sometimes become entangled in fishing gear. These animals are air-breathers, and will drown if they can't reach the surface. The green turtle, most commonly seen in Hawaii, nests on the isolated beaches of the NWHI. Green turtles may weigh upwards of 300 pounds. Leatherback turtles do not breed near Hawaii, but are often seen by fishermen. These giant reptiles may weigh up to 1500 pounds and may be identified by the ridges appearing lengthwise on the back shell.


If a seal or turtle becomes entangled or hooked, it should be released immediately by cutting the line as close to the hook as possible.

Any interactions with protected species (theft, fouled line, accidental hooking, etc.) must be reported so that problems can be understood, and, hopefully, resolved. Your use of the reporting forms will identify problem areas. If you are able to take photos of incidents, they will be very helpful in identifying species. The National Marine Fisheries Service will replace your film upon request.

PROTECTED SPECIES/BOTTOMFISHING INTERACTION OR INCIDENTAL "TAKE" FORM.

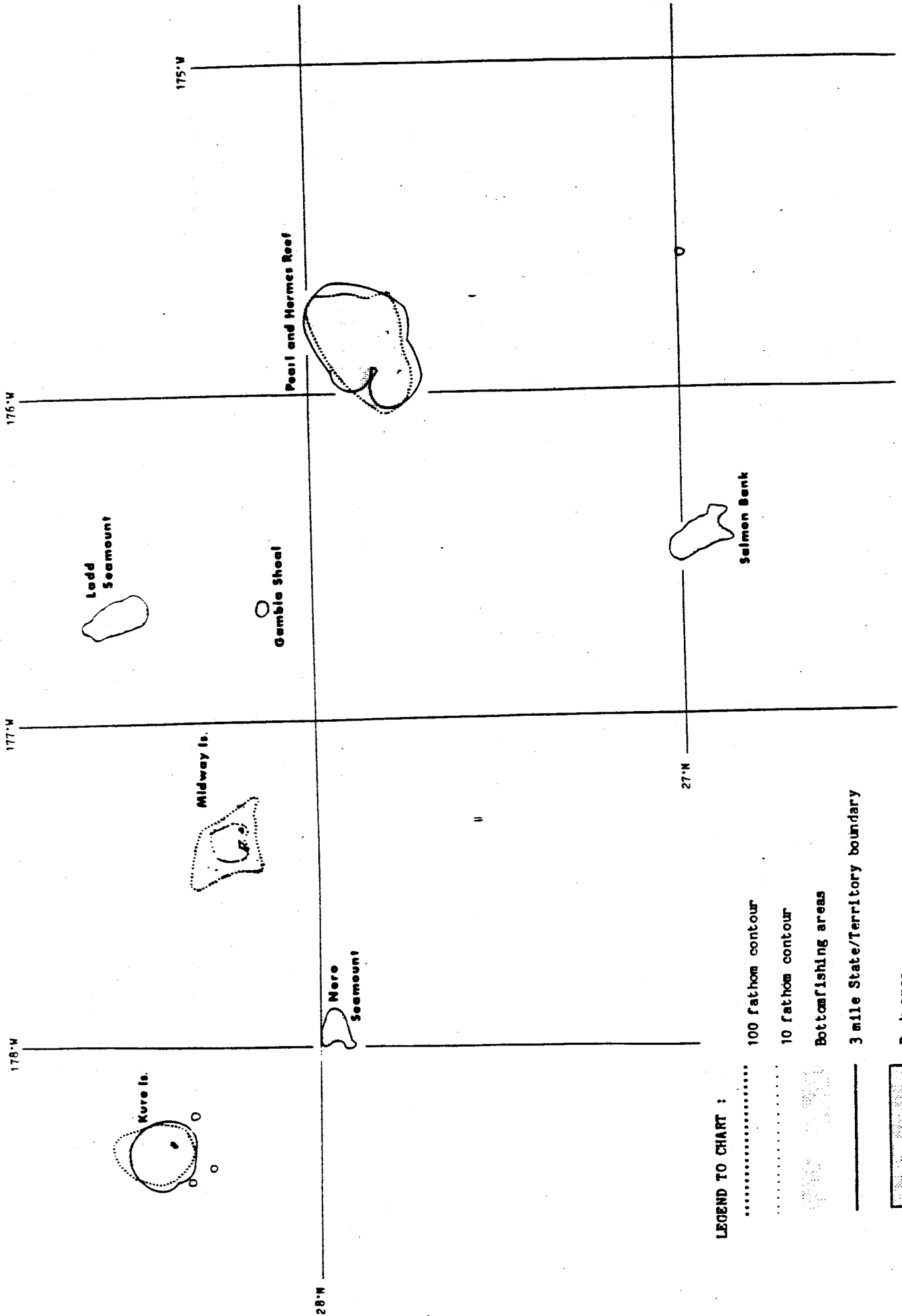
PROTECTED SPECIES INFORMATION	
Animals: _____	Number: _____
Size: _____	Date: _____ Time: _____
Vessel: _____	Observer: _____
Address & Ph: _____	
Type of fishing activity: _____	
Position (Lat/Long): _____	Photos?(Y/N) _____
Condition of animal upon release?:	
Dead: <input type="checkbox"/>	Alive (injured): <input type="checkbox"/> Alive (healthy): <input type="checkbox"/>
Comments (tags, injuries, description of incident):	

(Reverse of Protected Species Information Form):

OFFICIAL BUSINESS PENALTY FOR PRIVATE USE \$300	
POSTAGE AND FEES PAID	
<p>Western Pacific Program Office Marine Mammal Division SW Region, NMFS P.O. Box 3830 Honolulu, Hawaii 96812</p>	

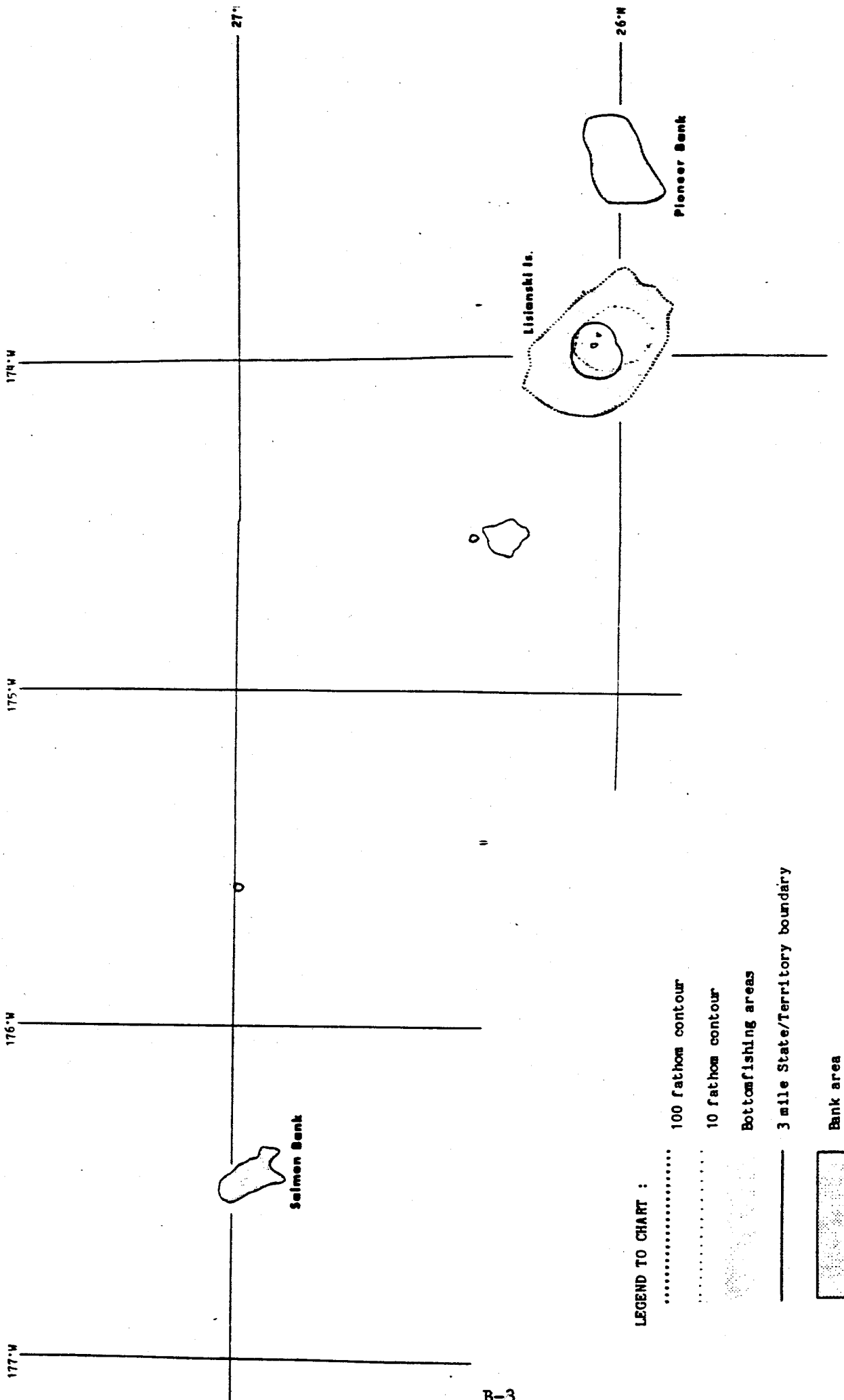
APPENDIX B

GENERALIZED MAP OF MAJOR BOTTOMFISHING GROUNDS



LEGEND TO CHART :

- 100 fathom contour
- 10 fathom contour
- Bottomfishing areas
- 3 mile State/Territory boundary
- Bank area



LEGEND TO CHART :

- 100 fathoms contour
- 10 fathoms contour
- Bottomfishing areas
- 3 mile State/Territory boundary
- Bank area

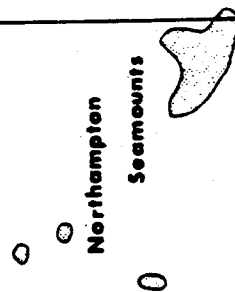
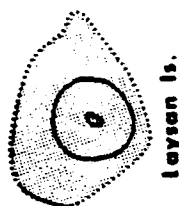
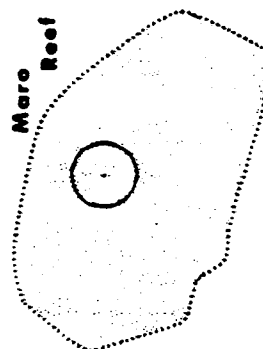
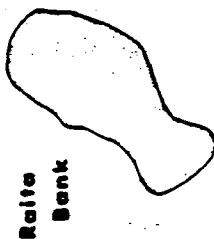
170°W

171°W

172°W

26°N

25°N



LEGEND TO CHART :

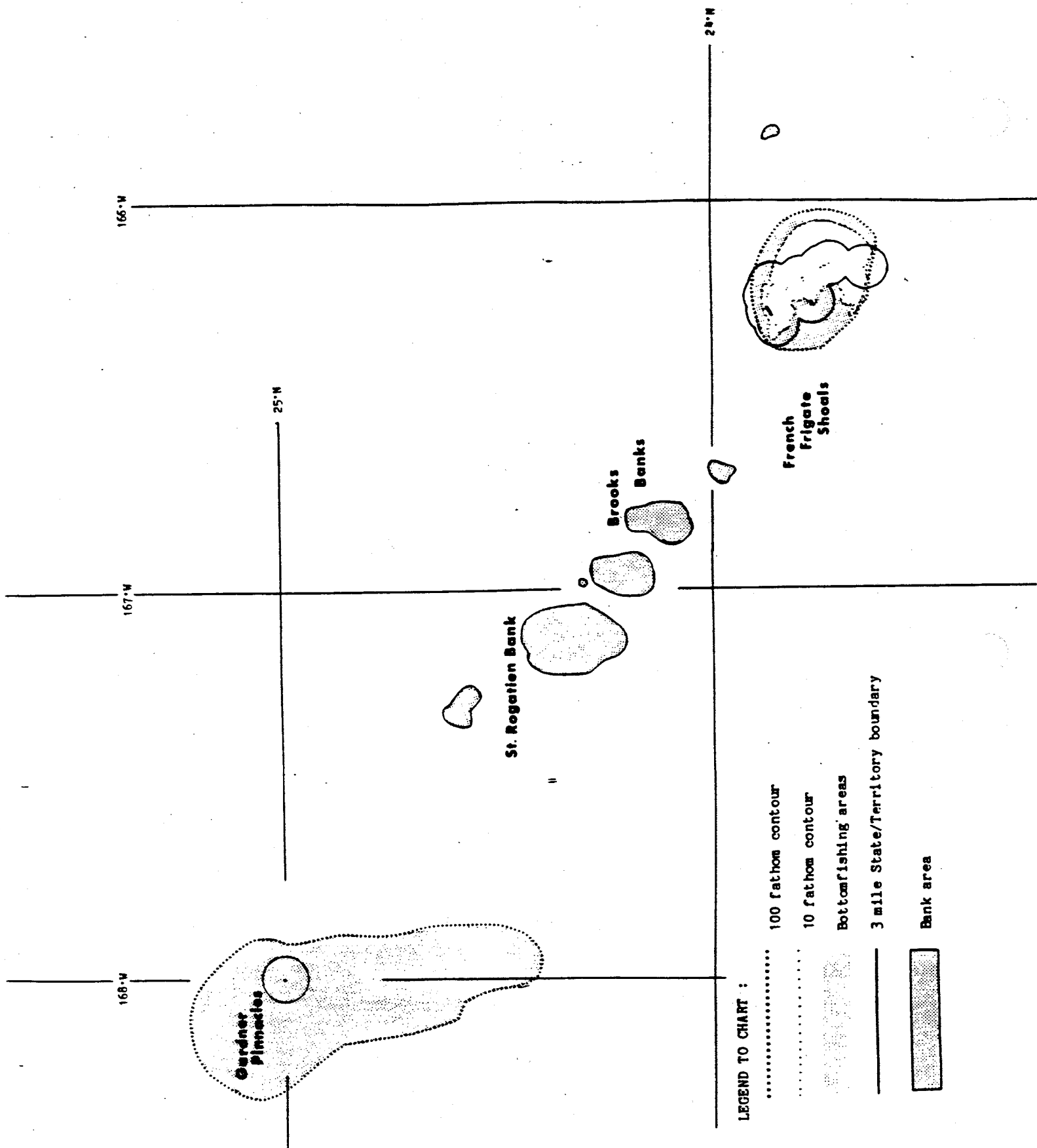
..... 100 fathom contour

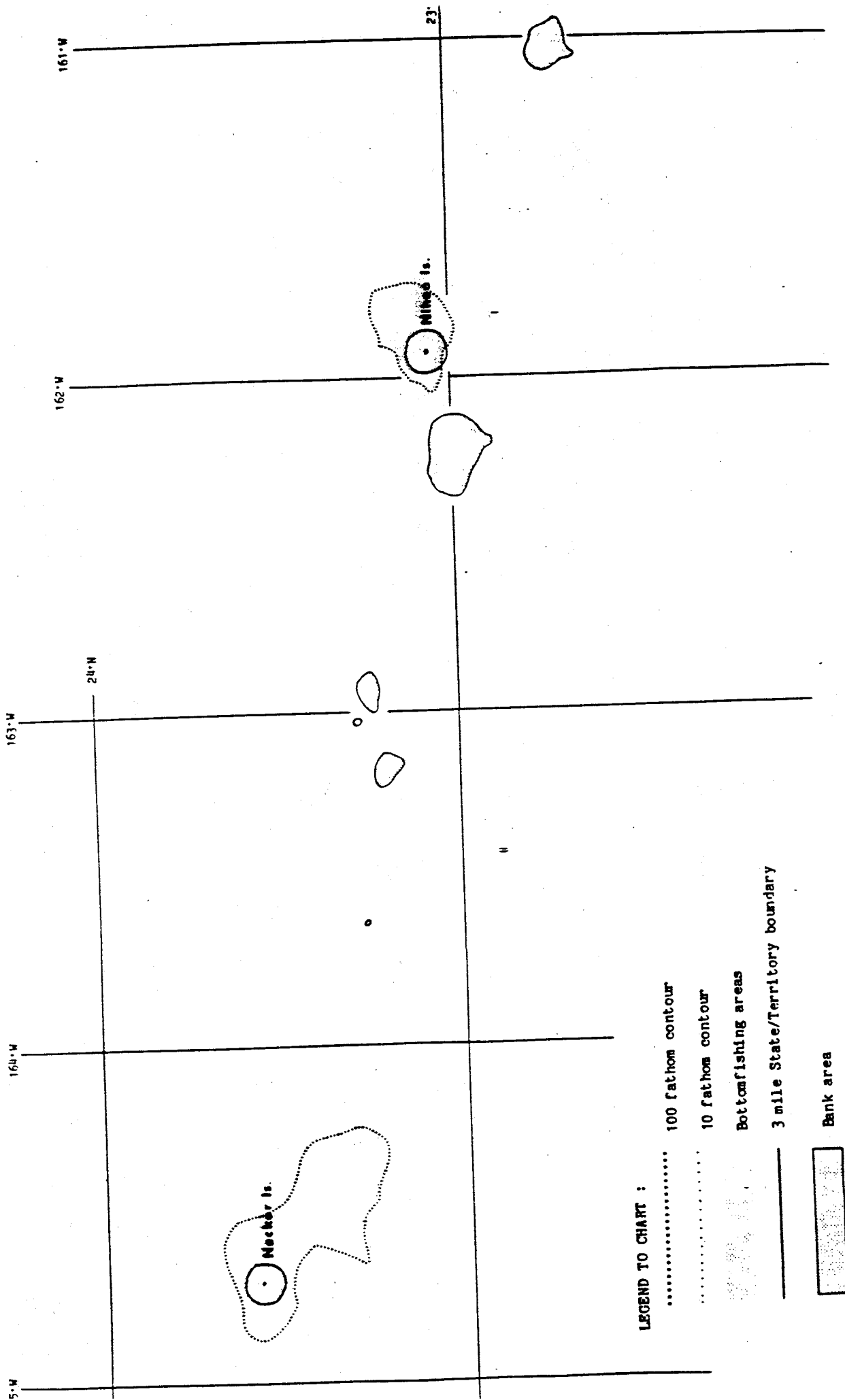
..... 10 fathom contour

Bottomfishing areas

3 mile State/Territory boundary

Bank area





LEGEND TO CHART :

..... 100 fathom contour

..... 10 fathom contour

Bottomfishing areas

— 3 mile State/Territory boundary

Bank area

159° 20' W

159° 40' W

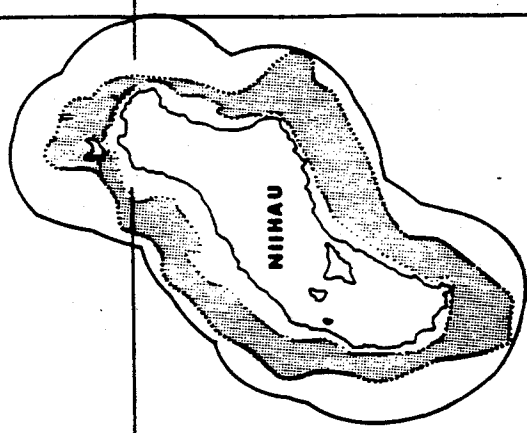
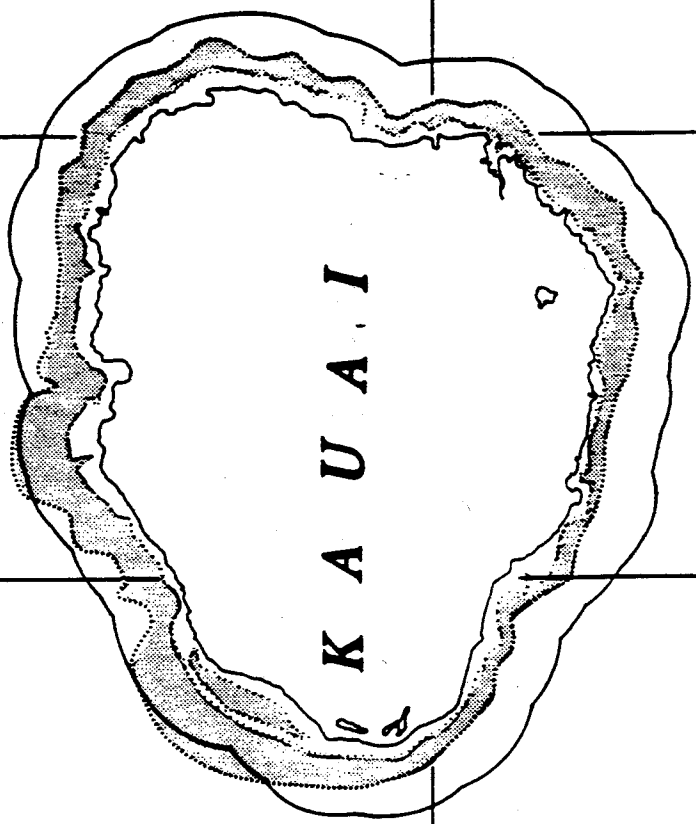
160° W

161° W

22° 20' N

22° N

21° 40' N



LEGEND TO CHART :

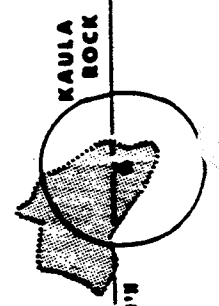
..... 100 fathom contour

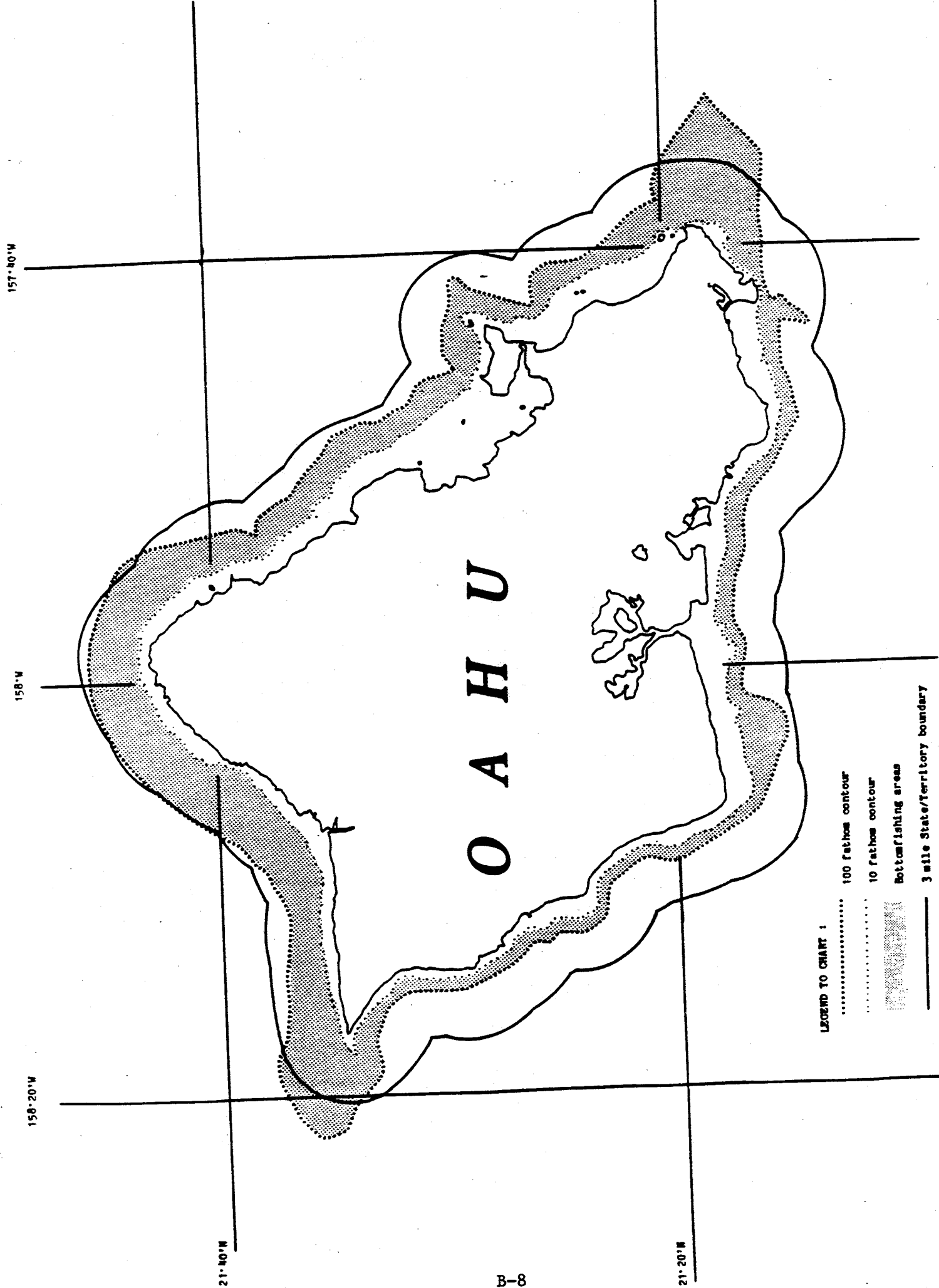
..... 10 fathom contour

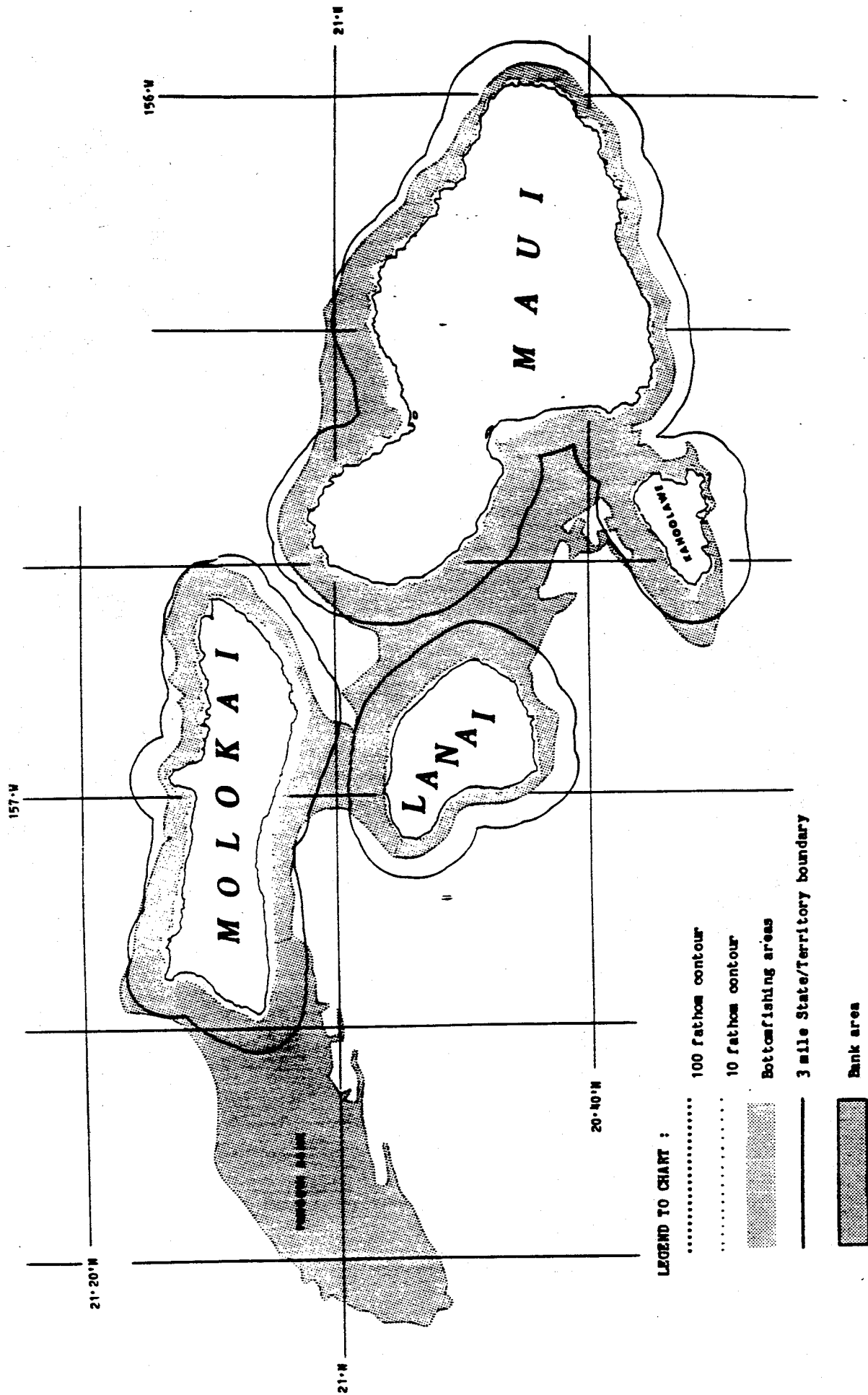
..... Bottomfishing areas

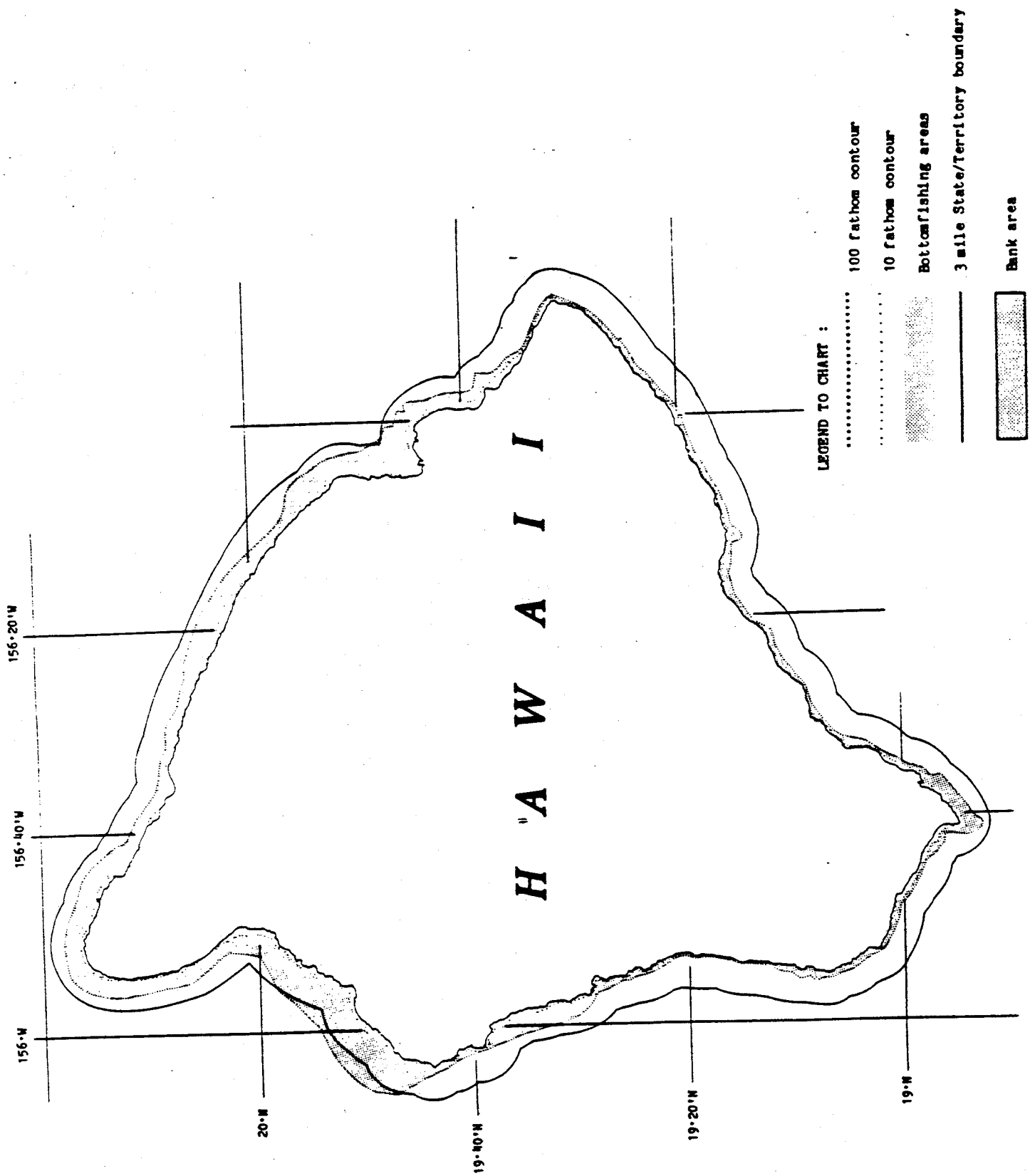
—— 3 mile State/Territory boundary

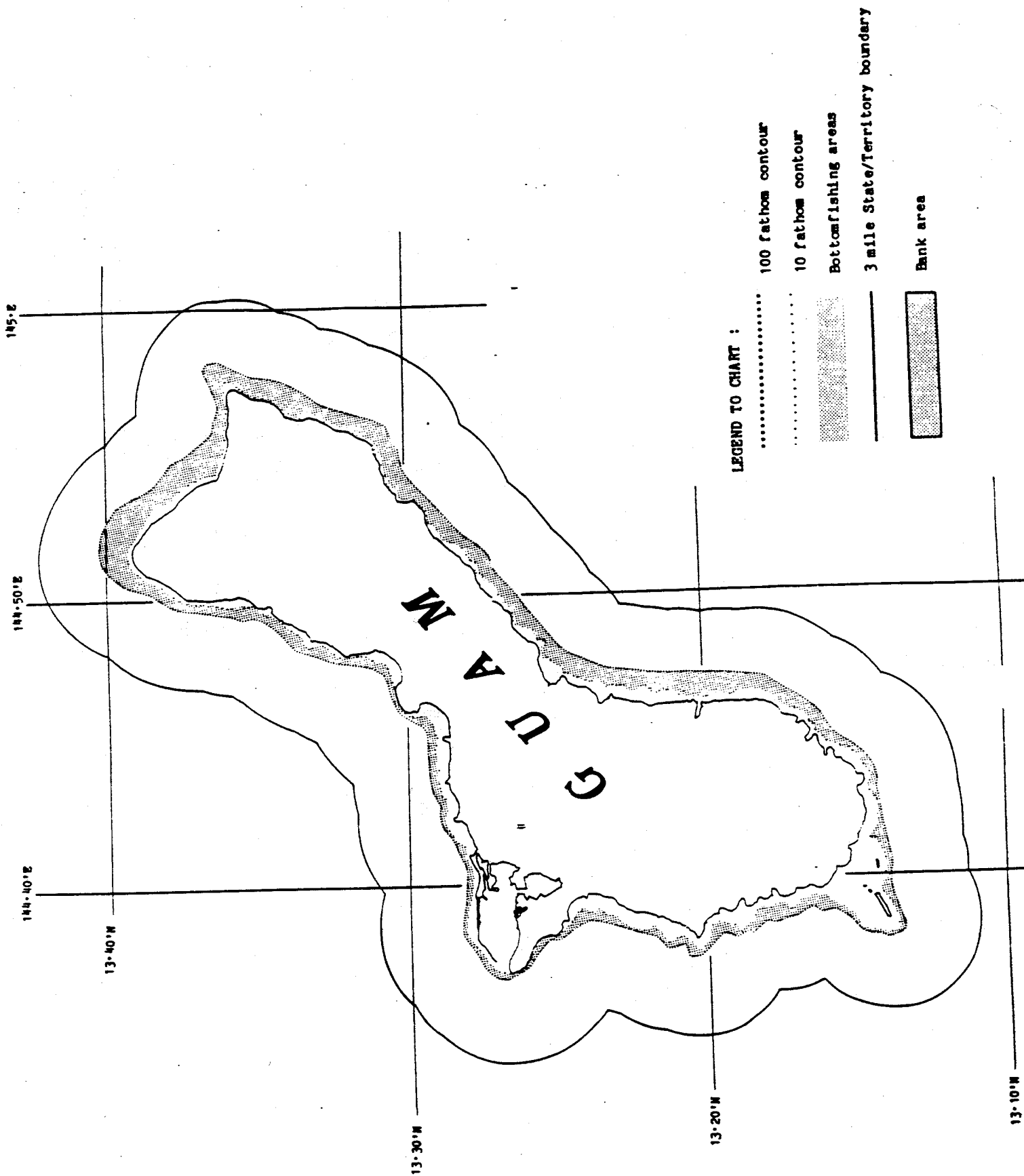
■ Bank area











GALVEZ

BANK

SANTA ROSA



BANK

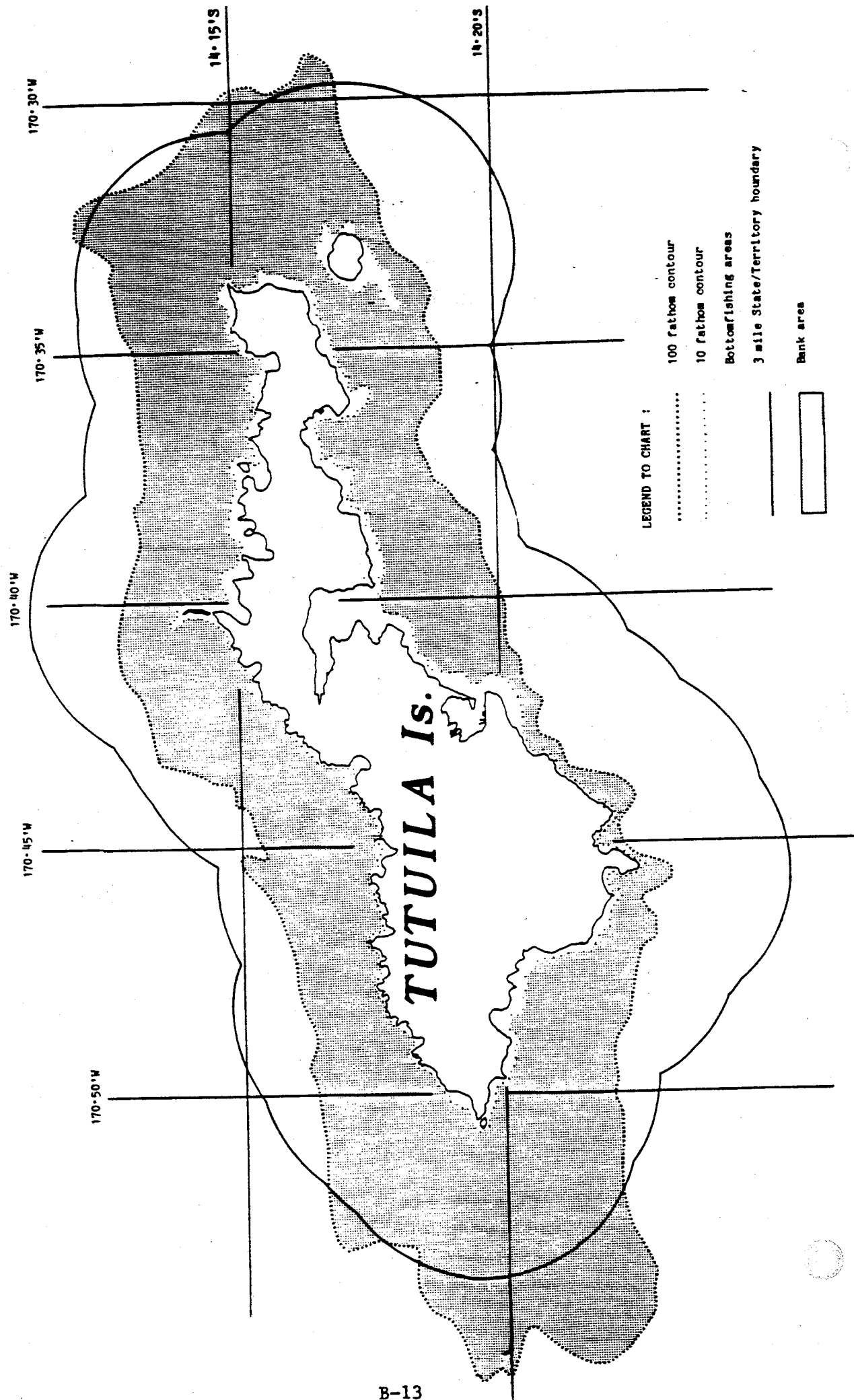
13°N

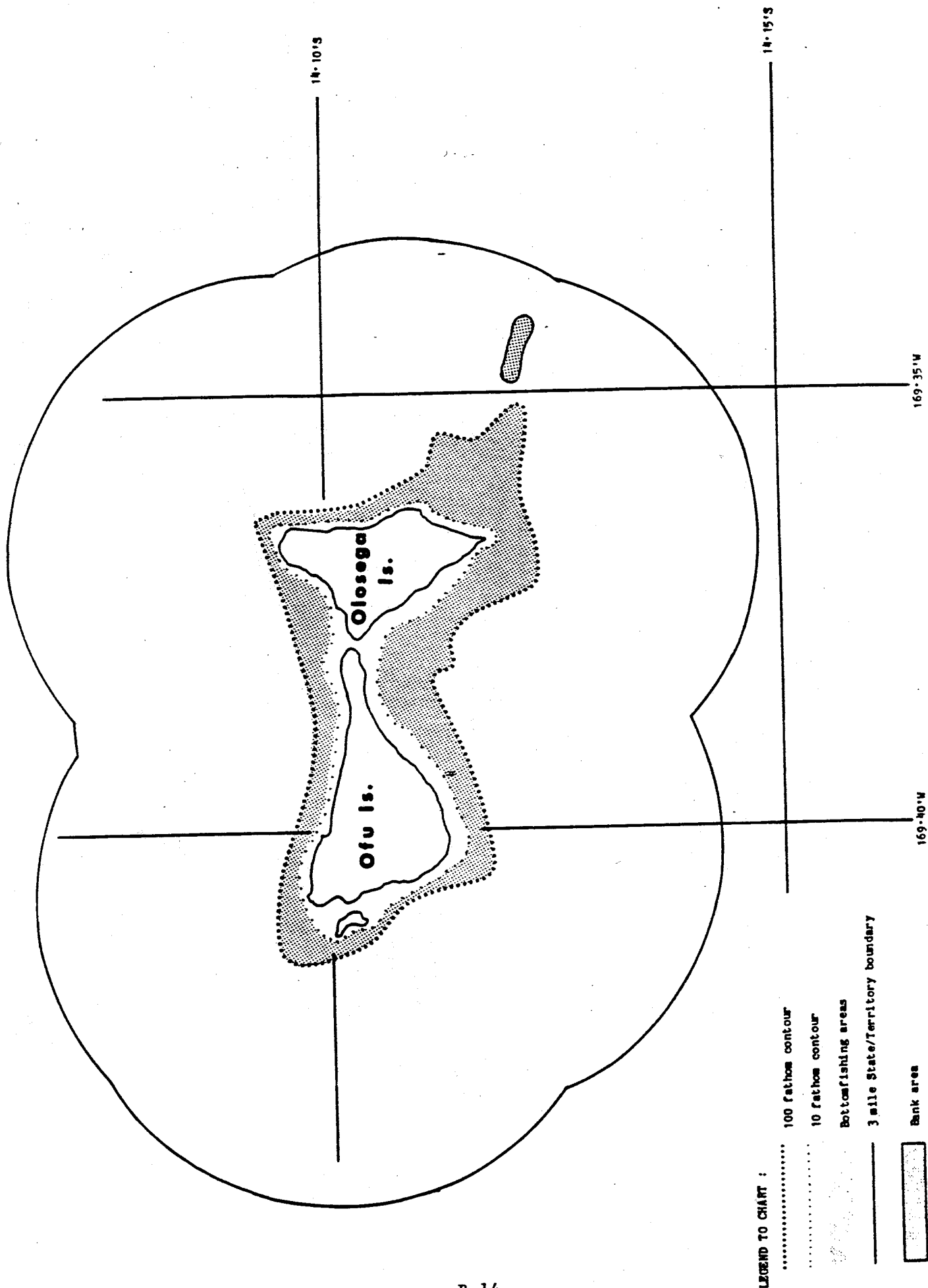
12°50'N

144°30'E

LEGEND TO CHART :

- 100 fathom contour
- 10 fathom contour
-  Bottomfishing areas
- 3 mile State/Territory boundary
-  Bank area





LEGEND TO CHART :

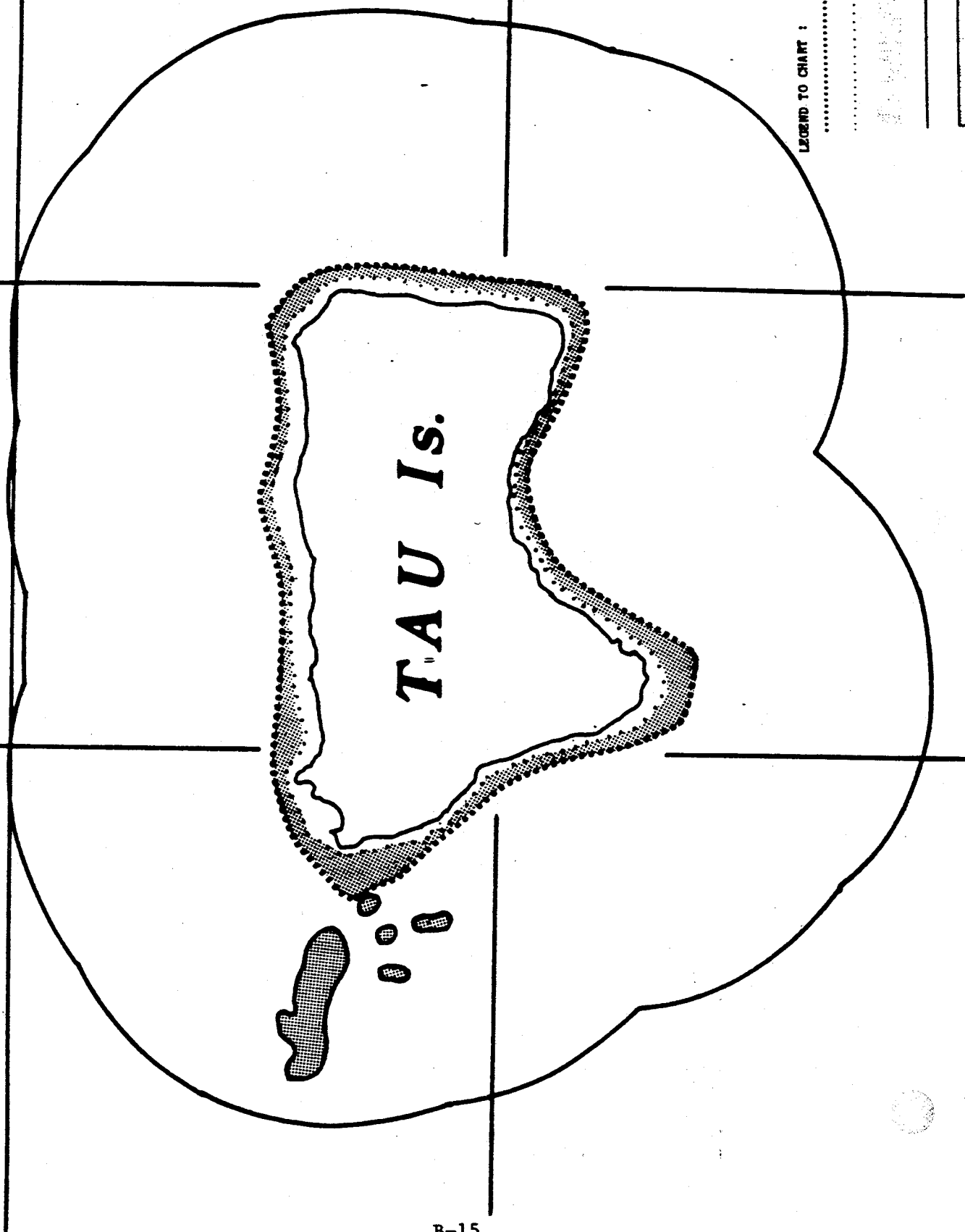
- 100 fathom contour
- 10 fathom contour
- Bottomfishing areas
- 3 mile State/Territory boundary
- Bank area

169° 25' W

169° 30' W

18° 10'

18° 15' S



LEGEND TO CHART :

..... 100 fathom contour

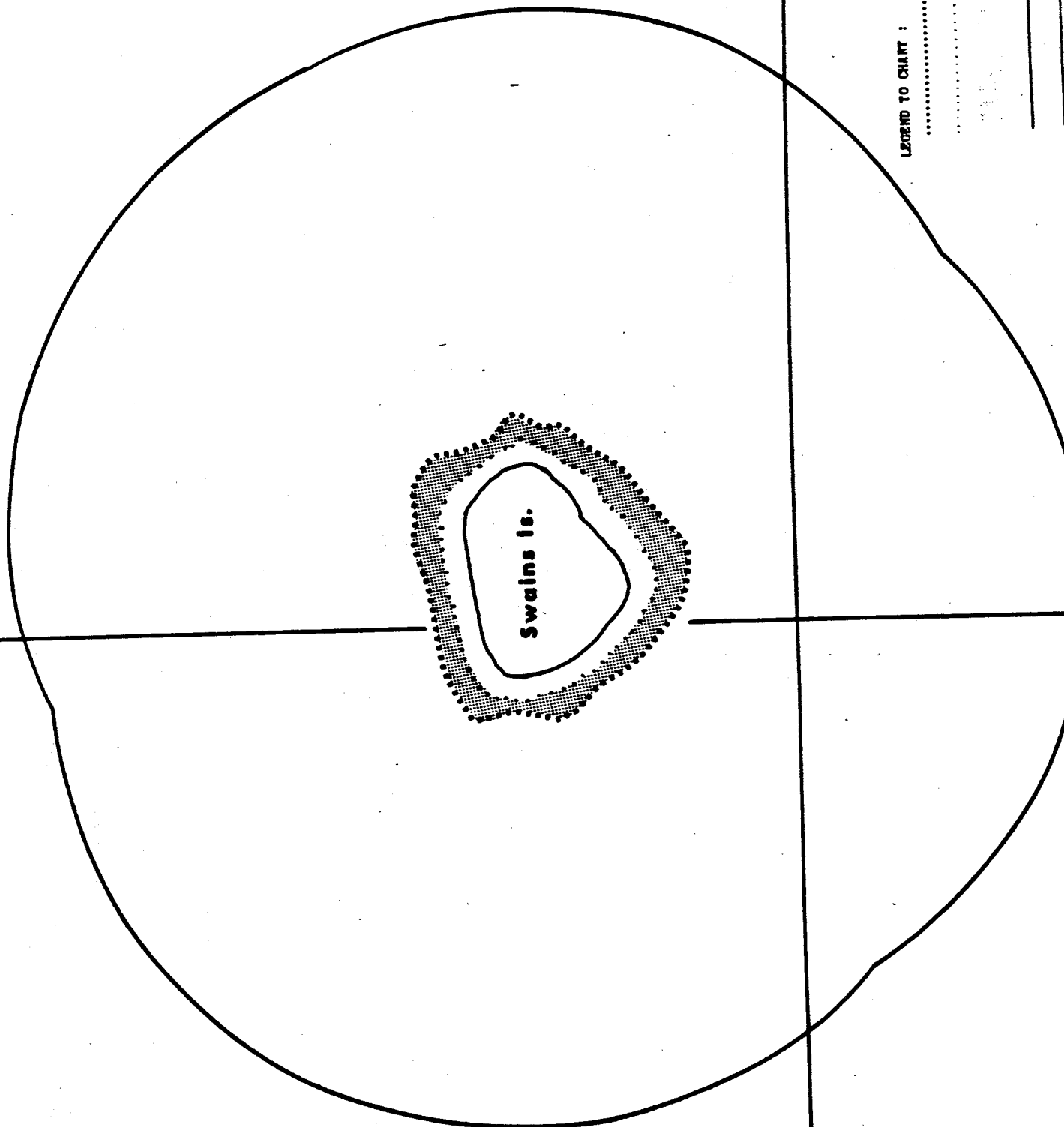
..... 10 fathom contour

..... Bottomfishing area

..... 3 mi Ice/Territory bounds

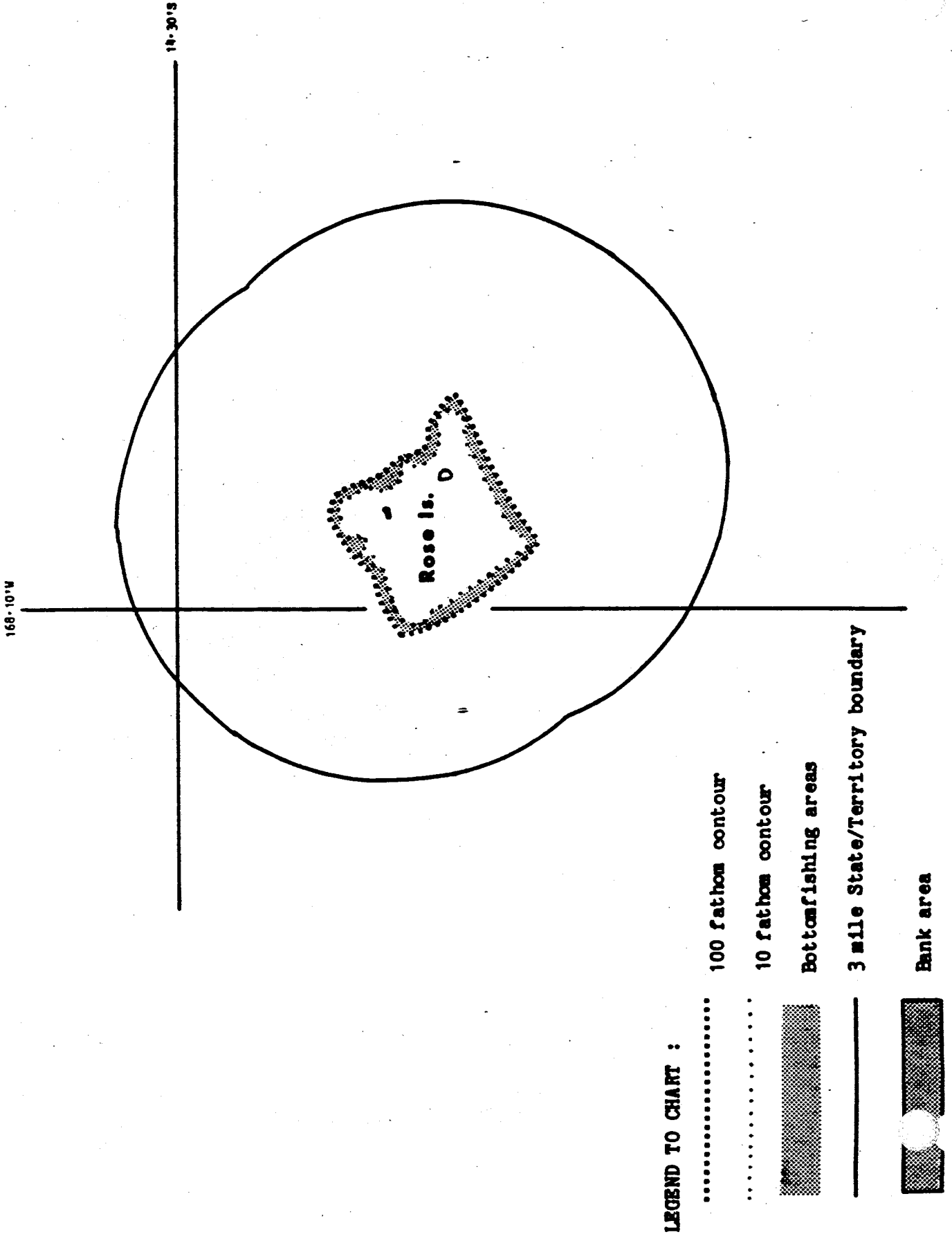
171°05'W

11°05'S

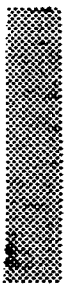



LEGEND TO CHART :

- 100 fathoms contour
- 10 fathoms contour
- Bottomfishing areas
- 3 mile State/Territory boundary



LEGEND TO CHART :

- 100 fathom contour
- 10 fathom contour
-  Bottomfishing areas
- 3 mile State/Territory boundary
-  Bank area

APPENDIX C

ADVISORY PANEL RESOLUTION

WESTERN PACIFIC REGIONAL FISHERY MANAGEMENT COUNCIL

1164 BISHOP STREET - ROOM 1405
HONOLULU, HAWAII 96813
TELEPHONE (808) 523-1368
FTS 546-8923

APPENDIX C

RESOLUTION

ADOPTED BY ADVISORY PANEL OF THE WHOLE

ON

AUGUST 7, 1985

WHEREAS, existing maps and charts of fishing grounds within the Fishery Conservation Zone (FCZ) around American Samoa are outdated and inaccurate, and

WHEREAS, updated and accurate maps and charts would reduce stress on fishing grounds which are presently exploited, and

WHEREAS, updated and accurate maps and charts will provide for growth and development of the local fishery in American Samoa, and

WHEREAS, updated and accurate maps and charts would assist the Western Pacific Regional Fishery Management Council in effectively managing the offshore fishery around American Samoa,

NOW, THEREFORE, BE IT RESOLVED that the Advisory Panel recommend to the Western Pacific Regional Fishery Management Council that appropriate action be taken to develop updated and accurate maps and charts of all fishing grounds in the FCZ around American Samoa.

8/7/85

APPENDIX D

STATE OF HAWAII -

- A) CATCH REPORT FORM**
- B) COMMERCIAL FISHING PERMIT APPLICATION**
- C) FISHERIES CHART #3 OF THE NORTHWESTERN HAWAIIAN ISLANDS**
- D) FISHERIES CHART #2 OF THE MAIN HAWAIIAN ISLANDS**

FG-1 (Rev. 7/86)

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES

COMMERCIAL MARINE LICENSE
1985-1986

- ☐ RENEWAL ☐ INDIVIDUAL
☐ NEW ☐ VESSEL
☐ MAIL ☐ VESSEL ADMENDMENT

Effective: Date of Issue to June 30, 1986

LICENSE NO. 86-0001

LICENSE FEE

RESIDENT x \$25 =

NON-RESIDENT x \$50 =

GRAND TOTAL

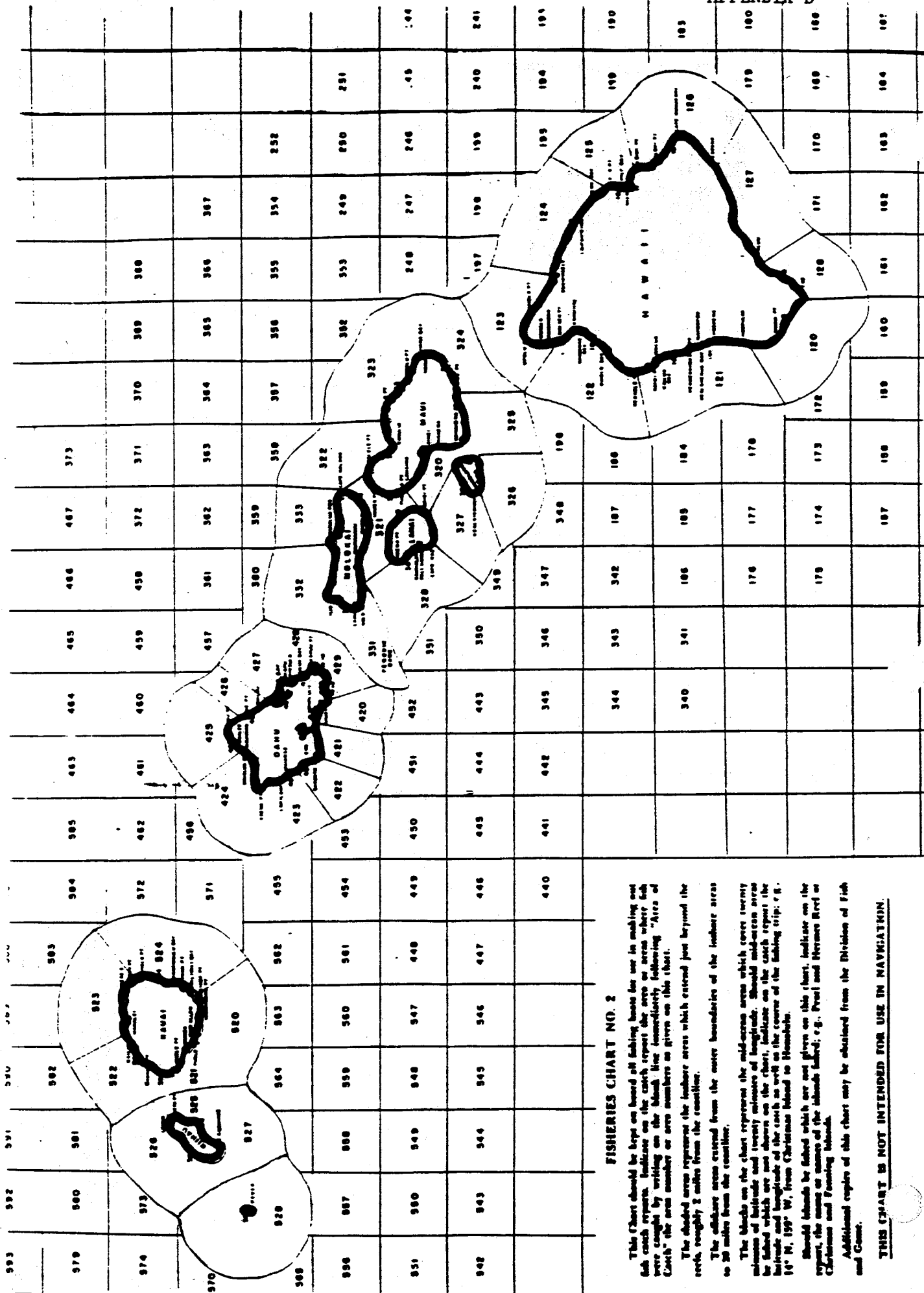
Name (Last, First, Middle Initial)		Sex M <input type="checkbox"/> F <input type="checkbox"/>	Birth Date	Weight	Height	Color of Hair	Color of Eyes
Mailing Address		City	County/State		Zip		
Residence		Street No. & Name	City	County/State		Zip	
Birth Place	Length of Residence in Hawaii	U.S. Citizen? <input type="checkbox"/> Yes <input type="checkbox"/> No		Business Phone	Home Phone	<input type="checkbox"/> PART-TIME COMMERCIAL <input type="checkbox"/> FULL-TIME COMMERCIAL**	
CHECK:		METHOD OF FISHING (Rank in order of Usage. No more than 3)			AREA FISHED		
<input type="checkbox"/> CREW MEMBER	Name of Boat	Deepsea HL (opaka, onaga, ehu)			<input type="checkbox"/> HI <input type="checkbox"/> NWHI <input type="checkbox"/> Other Specify		
		Trolling			X		
		Nets			SIGNATURE OF LICENSEE		
		Specify (gill, throw, trawl, purse, surround, etc.)			If Minor below age 18		
<input type="checkbox"/> BOAT CAPTAIN	Name of Boat	Traps (pot)			PARENT OR GUARDIAN		
	HA. No.	Ika-shibi/Palu-ahi					
<input type="checkbox"/> CHARTER	Documented No.:	Inshore HL (akule, opelu, moana)					
	Number of Crew:	Spear					
	Port of Anchorage:	Hand-pick (imu, opih, etc.)					
<input type="checkbox"/> SHORELINE FISHERMAN		Other (specify)					
		Aquarium (C-6)					
		Fish Pond (Pond)					
		Pole & Line (Aku boats) (C-4)					
		Longline (tagine, ahi boats) (C-5)					
		Other Longline (kaka line, set line)					
Monthly Fish Catch Report Required?					VALIDATION (LAND AND NATURAL RESOURCES USE ONLY)		
<input type="checkbox"/> Yes <input type="checkbox"/> No					AGENT		
					DATE		
					ISLAND		

*ANY PERSON WHO HAS RESIDED IN THE STATE FOR ONE YEAR OR LONGER (HAWAII REVISED STATUTES § 189-2)

**ANY PERSON WHO DERIVES MORE THAN ONE-HALF OF HIS GROSS ANNUAL INCOME FROM FISHING.

"ORIGINAL TO LICENSEE"

[illegible]



APPENDIX E

WPACFIN MEMORANDUM ON ANNUAL FISHERIES STATISTICS



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
Honolulu Laboratory
P. O. Box 3830
Honolulu, Hawaii 96812

September 11, 1985

TO: Distribution List
FROM: *David C. Hamm*
David C. Hamm, WPACFIN Program Manager

During the last Fisheries Data Coordinating Committee and Technical Subcommittee meetings it was decided that WPACFIN participants would begin producing an annual series of summary reports of fisheries statistics from the Pacific islands. The major purpose of the series is to disseminate regional fisheries data in a concise and timely manner, thereby reducing the number of data requests received by participants each year. Reports in the series will be informational and summary in nature and will not contain confidential information or scientific interpretation or analysis of the statistics. Some simple trends may be provided in graphical form, but analytical interpretation of them will not be made. The series will also help meet many of the standard, recurrent reporting requirements of most participants and will serve to tie the network together as a functioning entity.

As a WPACFIN participant, you will be one of the principle users of these reports. Therefore, I am requesting your suggestions and comments in developing the series. I have met with representatives of the major data contributing agencies and developed a basic outline for the series.

As it is currently designed the series will contain reports from Guam, the Commonwealth of the Northern Mariana Islands (CNMI), and American Samoa. It is unlikely that Hawaii will be able to provide landings information on a timely enough basis to be included in the annual series because the Hawaii data collecting and processing system still has about a 2-year lag time. However, the Division of Aquatic Resources is working to improve that situation and if they do, their reports will be added to the series. The first report in the series will include data from about 1980 to 1984 and will include available data from Hawaii. Subsequent reports will be produced annually and will be available as soon after the end of the calendar year as possible. These annual updates will contain only the most recent year's data unless updates to previously published data are needed.

Each report in the series will contain an introductory and overview section with comments about WPACFIN, its participants, the diversity of data collection systems, limitations of the data, and precautions for interpretation and comparison of the data sets. The remainder of each document will be divided into island specific sections. Each section will include a more detailed description of the origin and use of that island's data. All reports will be arranged on a calendar year basis, but each island's reports may vary in specific content and format based on their data collecting and reporting capabilities. Some reports will be provided

by WPACFIN central and some by each of the fisheries offices. The WPACFIN central will be responsible for final compilation and editing of the series.

Presently, the following island specific reports have been identified for inclusion in the series.

I. Guam

A. Guam Offshore Expansion System (GOES) reports:

1. Catch and effort reports - Monthly and calendar year reports by method will contain estimated weight in pounds and effort in boat hours, boat count, person hours, and person count. All estimates will include standard error and 90% confidence limits.
2. Species reports - Monthly and calendar year estimates of total weight and weight by method including percent species composition for totals and by method.

B. Guam Inshore Expansion System (GIES) reports:

1. Catch and effort reports - Similar to A.1. above, but for inshore methods and calendar year totals only.
2. Species reports - Similar to A.2. above, but for inshore methods and calendar year totals only.

C. Combined GOES/GIES species summary - Calendar year total weight and percent species composition regardless of method.

D. Commercial landings - Monthly and calendar year reports by species containing pounds, value, and average price per pound.

E. Vessel reports - Descriptive fleet characteristics and classification.

F. Special reports - See explanation to follow.

II. Commonwealth of the Northern Mariana Islands

A. Saipan Offshore Expansion System (SOES) reports - Similar to I.A.1., but for the island of Saipan.

B. Commercial landings - Similar to I.D., but for the island of Saipan.

C. Vessel reports - Similar to I.E., but for the CNMI.

D. Special reports - See explanation to follow.

III. American Samoa

- A. Commercial landings sampling - Similar to I.D. and II.B.
- B. Vessel reports - Similar to I.E. and II.C.
- C. American Samoa Expansion System (ASES) reports - This data collecting and processing system is to be implemented in late 1985 and reports from it will be included in the summary report series in the future. Reports similar to I.A.1. and I.A.2. will be included.
- D. Special reports - See explanation below.

SPECIAL REPORTS

It is envisioned that each island specific report will contain some special reports on species of particular interest or importance such as the pelagic management unit species, tunas, and other migratory or seasonal species. Species identified thus far are mahimahi, billfish, wahoo, skipjack tuna, yellowfin tuna, and white or dogtooth tuna. Other species can be added if desired. Summary tables and graphs of estimated total and/or commercial landings (depending on availability of data) will be provided for each species. Both monthly and annual graphs will be provided for seasonality and trend comparisons.

Since I helped establish a WPACFIN compatible system in Palau in 1983, it is possible to include commercial landings data from the Republic of Belau from mid-1983 to the present if it is desired and Belau agrees to do so. I also helped establish a similar system in Yap in 1984, so data from Yap may also become available for inclusion in the future if desired.

Your timely comments and suggestions regarding all aspects of the proposed summary report series (including suggestions for a title) will be appreciated. Thank you.

Distribution List:

Richard Shomura, SWFC/HL
 Kitty Simonds, WPRPMC ✓
 Doyle Gates, WPPO
 E. Charles Fullerton, SWR
 Henry Sakuda, Hawaii DAR
 Ray Tulafono, American Samoa OMR
 Harry Kami, Guam DAWR
 Arnold Palacios, CNMI DFW



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 Southwest Fisheries Center
 Honolulu Laboratory
 P. O. Box 3830
 Honolulu, Hawaii 96812

December 18, 1985

F/SWC2:DCH

TO:

DISTRIBUTION LIST

FROM:

David C. Hamm
 David C. Hamm, FDCC/TS Executive Officer, WPACFIN Program
 Manager

SUBJECT: Western Pacific fishery statistics report series

Since writing my September 11, 1985 memo describing the general contents of the upcoming report series, I've received comments, questions, and additional information that I would like to pass on to you. First of all, the Hawaii Division of Aquatic Resources (DAR) will have completed processing 1984 data as of this week and will be making those data available for inclusion in the first volume of the series. We will be including annual and monthly summaries by species for Hawaii for the calendar years 1979 through 1984. Staff from DAR are optimistic that they will be able to further reduce their data processing lag time to about 6 months, so it is possible that the 1985 annual report series, tentatively scheduled for late summer 1986, will include data for Hawaii as well. Secondly, data for Palau will most likely appear in the second volume with data for Guam (formal approval pending). Finally, the following graphs have been identified for use in the series to provide a more visual presentation of the data:

I. Monthly landings for each year's worth of data

- A. Fisheries mix of Troll, Bottom, Reef, and Miscellaneous
- B. Tunas, Pelagic Management Unit Species (PMUS), and Bottomfish Management Unit Species (BMUS)
- C. Wahoo, Mahimahi, and Billfishes
- D. Skipjack, Yellowfin, and Other Tunas

II. Seasonality plots using average monthly landings over time period

- A. Tunas, PMUS, BMUS
- B. Wahoo, and Mahimahi
- C. Blue Marlin, Sailfish, Spearfish (and other billfishes where applicable)
- D. Skipjack, Yellowfin, Other Tunas
- E. BMUS, and the 2 most important (by weight) species of the BMUS

III. Annual Trends

- A. Total Commercial Landings (pounds and value)
- B. Fisheries Mix of Troll, Bottom, Reef, Miscellaneous
- C. Tunas, PMUS, BMUS
- D. Skipjack, Yellowfin, Other Tunas
- E. Wahoo, Mahimahi, Billfish

- IV. Species plots of monthly landings over the entire time series for Wahoo, Mahimahi, Blue Marlin, Sailfish, Spearfish, Skipjack tuna, Yellowfin tuna, and two of the most important bottomfish species in each island area

Each island's reports will be separate within the document and will follow this general format:

- I. Narrative introduction/ background.
- II. Yearly reports including annual and monthly landings by species followed by graphs of type I above. All years will be presented in sequence.
- III. Remaining graphs in same order as described above.
- IV. Other reports and information as required and available.

Distribution List:

Izadore Barrett, SWFC
 Richard Shomura, SWFC/HL
 Kitty Simonds, WPRFMC
 Doyle Gates, WPPO
 E. Charles Fullerton, SWR
 Henry Sakuda, Hawaii DAR
 Ray Tulafono, American Samoa OMR
 Rufo Lujan, Guam DAWR
 Harry Kami, Guam DAWR
 Arnold Palacios, CNMI DFW

APPENDIX F

COST/BENEFIT COMPARISON OF FMP ALTERNATIVES

COST/BENEFIT COMPARISON OF FMP ALTERNATIVES

General approaches to managing the western Pacific bottomfish and seamount groundfish fisheries were compared qualitatively and quantitatively to the extent allowed by the available data.

F.1 Bottomfish Alternatives EvaluatedA. Federal or State/Territory Management

The most basic choice facing the Council was whether (1) to take no action and maintain the status quo (no short-term and long-term management of the bottomfish fishery in the FCZ; (2) to establish short-term and long-term Federal management in the FCZ; or (3) to support State/territory management programs in the short-term while working in the long-term toward Federal or Federal/State or territory management of the bottomfish fisheries across the range of the respective stock units. The options were evaluated for each management sub-area -- American Samoa, Guam, Hawaii.

F.1.1 American Samoa

In American Samoa, most of the fishing pressure on bottomfish stocks occurs inside the territorial sea, and the FCZ is viewed as an area where domestic harvesting of underutilized bottomfish resources could be expanded. At present, the FCZ fishery produces only about 8,000 pounds annually (10% of total bottomfish harvest). If valued at \$1.75 per pound (ex-vessel), the FCZ portion of the bottomfish fishery is presently worth \$14,000. Based on existing charts of the FCZ, bottomfishing grounds under Federal jurisdiction and within reasonable traveling distance from the fresh fish market may have the potential to produce an additional 12,000 pounds per year, worth \$21,000 ex-vessel and perhaps twice that amount at the wholesale level. Although better charting of the FCZ might indicate greater potential, the value of the FCZ fishery would still not be large enough to justify any additional Federal expenditure for data collection or enforcement. A Federal catch reporting requirement for the FCZ is also unjustified considering the potential catch and catch value in the FCZ.

The major limitation on bottomfish production, in the territorial sea as well as in the FCZ of American Samoa, is the small amount of natural habitat which satisfies the depth requirements of bottomfish. Considering this inherent limitation on fishery potential, the Council concluded that the only immediate action that would be justified in the FCZ would be to prohibit the use of explosives and poisons and on trawl nets and bottom-set nets to harvest bottomfish. These destructive fishing techniques could have a long-lasting and detrimental effect on bottomfish habitat. A prohibition on gear which could be detrimental to fish habitat in the FCZ would be supportive of future American Samoa Government resource conservation initiatives in the territorial sea (Office of Marine Resources personnel, pers. comm.) (Appendix I).

The gear restrictions proposed for the FCZ (prohibition against the use of bottom trawl and bottom-set nets and against the use of explosives or poisons for fishing) can only practically be enforced by port inspections because at-sea enforcement resources are severely limited. The capabilities of the NMFS and the Coast Guard to perform port inspections in American Samoa are practically non-existent, and the FMP does not recommend an additional Federal expenditure solely for this purpose. The most cost-effective method of enforcement of the recommended gear restrictions would be by American Samoa government personnel who are enforcing similar locally-adopted restrictions for the territorial sea. Table F.1 summarizes the management options for American Samoa.

TABLE F.1

EVALUATION OF MANAGEMENT OPTIONS FOR AMERICAN SAMOA BOTTOMFISH FISHERY

Options	Evaluation
Administrative "framework" for raising management concerns and recommending future regulatory adjustments in FCZ and territorial sea.	Desirable if data collection and analysis are maintained at existing levels of expenditure.
No short-term and long-term management by Federal regulations.	Acceptable only if ASG is able to take effective action independently to protect habitat and to initiate other conservation measures when needed.
Short-term and long-term management by Federal regulations.	Unacceptable due to small potential yield of FCZ Fishery.
Federal gear restrictions in FCZ to support ASG protection of extremely limited habitat.	Desirable in support of ASG initiatives to protect habitat by a prohibition on destructive fishing methods (i.e., explosives and poisons) if enforcement can be accomplished through port inspections which consolidate several enforcement activities.

F.1.2 Guam

In Guam, the present distribution of the bottomfish fishery is similar to that in American Samoa. However, the FCZ is better charted, and the potential exists for perhaps an annual yield of 27,000 pounds from the FCZ. If valued at the 1983 average price (ex-vessel) of \$1.89 per pound, the FCZ fishery is potentially worth approximately \$51,000 per year. As in American Samoa, habitat seems to be the most limiting factor and protection of habitat against long-lasting damage by explosives, poisons, trawl and bottom-set nets is the most urgent management need. The potential value of the FCZ fishery is too small to justify additional Federal expenditures specifically for bottomfish management, and the general recommendations for American Samoa also apply to Guam.

The gear restrictions proposed for the FCZ (prohibition against the use of bottom trawl and bottom-set nets and against the use of explosives or poisons for fishing) can only prac-

tically be enforced by port inspections because at-sea enforcement resources are so severely limited. The NMFS and the Coast Guard have the capability to perform port inspections in Guam, but the FMP does not recommend an additional Federal expenditure solely for this purpose. The most cost-effective method of enforcement of the recommended gear restrictions would be by Guam government personnel who are enforcing similar locally-adopted restrictions for the territorial sea. Table F.2 summarizes the management options for Guam.

TABLE F.2

EVALUATION OF MANAGEMENT OPTIONS FOR GUAM BOTTOMFISH FISHERY

Options	Evaluation
Administrative "framework" for raising management concerns and recommending future regulatory adjustments in FCZ and territorial sea.	Desirable if data collection and analysis is maintained at existing levels of expenditure.
No short-term and long-term management by Federal regulations.	Acceptable if Government of Guam is able to take effective action to protect habitat and to institute other conservation measures when needed.
Short-term and long-term management by Federal regulations.	Unacceptable due to small potential yield of FCZ fishery.
Federal gear restrictions in FCZ to support Government of Guam protection of extremely limited habitat.	Desirable in support of Government of Guam rules against destructive fishing methods (i.e., explosives and poisons) if enforcement can be accomplished through port inspections which consolidate several enforcement activities.

F.1.3 Hawaii

Although bottomfish catch data for Hawaii are not reported in a manner that allows clearcut differentiation of the FCZ and territorial sea fisheries, maps of the major bottom-fishing grounds (see Appendix B) and interviews with fishermen suggest that the vast majority (80%) of the bottomfish catch off the main Hawaiian Islands is from the territorial sea, whereas the vast majority (90% or more) of the bottomfish catch in the

NWHI is from the FCZ. The State of Hawaii (and the territories) have jurisdiction over vessels registered with them even if those vessels fish in the FCZ, so long as the management regime does not contravene Federal regulations.

Like Guam, the State of Hawaii has rules which prohibit the possession or use of explosives or poisons for fishing. Although bottomfish habitat off the Hawaiian Islands is not as severely restricted as off Guam or American Samoa, habitat is the major factor which limits fishery yields and the arguments for prohibiting destructive fishing gear in the FCZ off Hawaii are the same as for Guam and American Samoa. Lost nets are potentially harmful to bottomfish habitat, and the banks and slopes which harbor bottomfish are generally so small that efficient and potentially destructive fishing methods employing explosives, poisons, or trawl nets carry a high risk of long-term or perhaps irreversible damage to fish habitat.

In addition to gear restrictions, the State has a minimum size limit of one pound for sale of opakapaka, onaga, uku, and ulua. This size limit was established by statute in 1925 due to concern about a "decreasing supply of fish". Hawaii's one-pound minimum size limit for sale seems to coincide with the mean size of entry into the hook-and-line fishery for opakapaka and perhaps other species (Ralston and Kawamoto, 1985). The major benefit of the one-pound size limit cited by State personnel familiar with its enforcement is that it deters the use of non-selective gear which could indiscriminately harvest concentrations of undersized bottomfishes. However, the one-pound existing size limit does not postpone hook-and-line harvest of most of the regulated species before they have reproduced once, nor does it maximize the yield-per-recruit of adult fishes.

Although the State could theoretically manage both the territorial sea and FCZ portions of the bottomfish fishery through minimum size limits for sale or new landing laws, the lengthy process involved in obtaining new amended legislation presents an obstacle to timely effective management. Most State management provisions are statutorily-established. It is not possible to initiate statutory amendments except by the local legislature during the part of the year when they are in session. Even then, it is not assured that amendments would receive legislative approval, as exemplified by the defeat of a measure to increase the minimum size of opakapaka for sale from one pound to three pounds during the 1985 session of the Hawaii State Legislature. New legislation is also relatively costly. The average cost per piece of legislation approved by the 1983 State Legislative was about \$25,000.

Size limits are among the future options for Council action under the framework procedure and they could be established relatively rapidly under the framework procedure (90-120 days). The Adoption of a larger minimum size for sale of opakapaka (greater than one pound) taken in the FCZ of the NWHI was considered for immediate implementation under the FMP. This measure could assist in maintaining stable landings of opakapaka in the size ranges targeted for the restaurant fillet market. If implemented under a Federal landing law, minimum size limits could cover all landings unless a vessel fished only in or was licensed to fish only in the territorial sea. This option raised too much potential for inconsistency in Federal/State management, because of differences between the size limit which would be needed to raise the age at entry into the hook-and-line fishery and the existing one-pound minimum size limit for sale under State law.

If a particular size of bottomfish could not be taken legally in the FCZ pursuant to Federal regulations implemented under this plan, but the same size of fish is legal if taken in the territorial sea, the Federal enforcement officer would have to be able to prove that the fish was caught in the FCZ. This would increase the complexity and Federal cost of enforcement, as dockside or market inspections might not be feasible enforcement methods.

Selective area closures in the FCZ were considered for immediate implementation under the FMP. Closures could mitigate the risk of overfishing, but at a high enforcement cost, \$800,000 or more annually if U.S. Coast Guard aircraft surveillance of the NWHI had to be doubled. Initial selection of areas to be closed would require a large amount of new data to demonstrate the need for selective closures.

The management options for Hawaii are evaluated in Table F.3.

TABLE F.3
EVALUATION OF MANAGEMENT OPTIONS FOR HAWAII BOTTOMFISH FISHERY

Options	Evaluation
Administrative "framework" for raising management concerns and recommending future regulatory adjustments in FCZ and territorial sea.	Desirable to allow flexibility in management responses and to achieve consistency in Federal/State management. It is not possible to quantify the cost of not achieving consistency but in areas of the U.S. mainland where regional fishery Councils and States have not cooperated, this has sometimes led to costly legal action.
No short-term and long-term management by Federal regulations.	Acceptable in main islands but unacceptable in NWHI because the majority of bottomfish grounds are in the FCZ and because a large percentage of the fleet is registered out-of-state.
Short-term and long-term management by Federal regulations.	Unacceptable in main islands because of small FCZ fishery, but acceptable in NWHI because of large FCZ fishery. Risk of inconsistency with State management action.
Federal gear restrictions in FCZ to support State protection of limited habitat.	Desirable if enforcement can be accomplished through port inspections which consolidate several enforcement activities. Supports the State's laws prohibiting the use of destructive fishing methods (i.e., explosives and poisons).
Larger minimum size limit for opakapaka taken in FCZ of NWHI than State one-pound size for sale.	Could help maintain the present size composition of the opakapaka catch which is more valuable for restaurant fillet market than are smaller fish. High risk of inconsistency with State management and increased enforcement difficulty and cost.

TABLE F.3

EVALUATION OF MANAGEMENT OPTIONS FOR HAWAII BOTTOMFISH FISHERY
(Continued)

Options	Evaluation
Adopt State one-pound minimum size for sale limit for opakapaka, onaga, uku, and ulua taken in FCZ.	Would promote consistency in Federal/State management while maintaining the opportunity to raise the minimum size through regulatory adjustments under the "framework". High risk of duplicating State's enforcement efforts and increased costs. Also very little protection against recruitment overfishing.
Selective area closures in FCZ.	Very difficult and costly to enforce for small areas and for specific fishing methods (i.e., bottomfishing). Large closures to <u>all</u> fisheries are enforceable but would close some fisheries unnecessarily to conserve bottomfish stocks.

B. Single-Species vs. Multi-Species Management Unit

The second basic choice facing the Council was whether to (1) manage each bottomfish species as the need arises; or (2) manage bottomfish species as a unit recognizing that the various species are in different stages of exploitation. It is relatively straightforward to manage the bottomfish species complex through the annual review and framework rule-making process prepared in the FMP. If species-by-species management were practiced, this would necessitate continual amendment of the FMP to redefine the management unit, and the administrative cost would be much greater than multi-species management under the annual review and framework process.

C. Framework FMP vs. Conventional FMP

A third basic choice facing the Council was whether to establish Federal regulations immediately through preparation of a conventional FMP

or to provide for flexibility in management responses and to address the problem of incomplete scientific data. As bottomfishing habitat is the most critical factor limiting fishery yields in the western Pacific, it was believed necessary to provide immediate protection in the FCZ to complement existing State/territory regulations and CZM policies. Hence, prohibitions against the use of explosives, poisons, bottom trawl and bottom-set nets were recommended for immediate implementation. Enforcement can be cost-effective if accomplished by port inspections which consolidate several enforcement activities. Added protection will be afforded to protected species, and economic impacts will be positive. Assuming that the MSY per unit of bottomfish habitat ranges from 400 pounds to 600 pounds per nautical mile of 100-fathom isobath, long-lasting or irreversible damage to the bottom habitat would cost the fishery at least \$800 to \$1,200 per year (at \$2.00 per pound ex-vessel price) for each nautical mile which is damaged.

A second critical consideration is that the biological nature of many bottomfish species suggests that recovery to levels of sustained yield may be prolonged once overharvesting has occurred. Therefore, timeliness in management response is needed to prevent severe disruptions in production and economic losses. The framework FMP offers a means of expediting action through the elimination of certain bureaucratic barriers associated with FMP approval. The framework would not eliminate Regulatory Impact Analysis/Regulatory Flexibility Act requirements, public hearings, determination of consistency with MFCMA National Standards, or coastal zone consistency determination for any specific new regulation proposed. The framework procedure can be expected to save at least 140 days of time associated with the normal FMP approval process and perhaps as much as nine months of lead time associated with the normal informal review of a FMP. Consistency in Federal/State or territory management would also be promoted through the annual review and framework rule-making procedure.

Although it may require 90 to 120 days to implement a Federal regulation under the framework FMP, a time savings of 5-9 months would still reduce administrative costs, relative to the FMP amendment process. Furthermore, the framework process could prevent stock reductions and economic losses that would occur during the 5-9 months of plan review and approval. Experience in the NWHI bottomfish fishery has shown that CPUE can be reduced by 50% or more along a bank perimeter of 100 nautical miles in a 5 to 9 month period. The minimum value of a reduction of this magnitude would be \$40,000-\$60,000 per year multiplied by a recovery period of 3-5 years for a potential loss totalling \$120,000-\$300,000. To reflect the economic impact on the Hawaii fishing industry, the savings of 5-9 months in reaction time through a framework management process could be valued at the wholesale price of the potential catch or roughly twice the ex-vessel value.

The management costs under a no FMP, a conventional FMP, and a framework FMP is estimated on Table F.4.

TABLE F.4
MANAGEMENT COSTS

	No FMP	Conventional FMP ¹	Framework FMP ²
NMFS/NOAA:			
Administration	\$ -0-	\$ 50,000 ³	\$ 30,000 ⁴
Enforcement	-0-	50,000 ⁵	-0- ⁶
Research	246,000 ^{7a}	246,000 ⁷	246,000 ⁷
Data analysis	-0-	65,000 ⁸	65,000 ⁸
Subtotal	246,000	411,000	341,000
WPRFMC:			
Council administration	12,000 ^{9a}	24,000 ^{9b}	12,000 ^{9c}
Plan monitoring team	30,000 ¹⁰	30,000 ¹⁰	30,000 ¹⁰
Subtotal	42,000	54,000	42,000
STATE OF HAWAII:			
Upgrading Hawaii fisheries statistics system: small business micro-computer, fishing effort reports, data base report generation software (\$65,595 of a total cost of \$290,000 can be allocated to bottomfish fishery, based on the proportion of total fish catch reports which include management unit species).			
Data collection and enforcement	20,000 ¹¹	20,000 ¹¹	20,000 ¹¹
Subtotal	20,000	20,000	20,000
U.S. COAST GUARD:			
Enforcement (all fisheries)	1,830,000 ¹²	1,830,000 ¹²	1,830,000 ¹²
TOTAL	\$ 308,000	\$ 485,000	\$ 403,000

1 Assumes regulations promulgated through FMP amendments at a rate of one per year.

2 Assumes regulations promulgated under framework process at a rate of one per year.

- 3 Assumes that each FMP amendment requires about one man-year, collectively, of NMFS/NOAA personnel time for review and processing by SWR and headquarters staffs.
- 4 Same assumption as 3 except that a minimum of 140 days can be saved through framework process.
- 5 Based on number of active participants in fishery, the cost of NMFS shoreside enforcement effort would be approximately one additional man-year, representing an increase of about \$50,000.
- 6 The framework plan does not initially generate a substantial increase in Federal enforcement burden. If actions are subsequently taken under the framework process, the cost of enforcement among other things will be fully considered before the action is final.
- 7 The only major new research effort under the FMP is the Seamount Resources Study by the NMFS Honolulu Laboratory. This study was initiated by NMFS and does depend upon whether there is a FMP or not.
 - a) If there was no FMP or minimal interest in seamount resources the funding would be considerably less.
- 8 Assumes that NMFS Honolulu Laboratory will have responsibility for analysis of State/Territory catch data and other data for the Plan Monitoring Team to consider in preparing the annual review. The estimated cost of analyzing catch reports under Spiny Lobster FMP would approximate cost of data analysis for Bottomfish annual review.
- 9 Costs are estimated on the basis that one full Council meeting held in Hawaii costs about \$12,000, and that preparation for each meeting and follow-up after each meeting on each major fishery issue costs about \$6,000 in staff time.

Even without a FMP, issues would be raised and staff time expended on the bottomfish fishery.

- a) Assumes that one half of one full meeting (\$12,000 divided by 2) would be devoted to bottomfish issues over the course of a year, with preparation and follow-up by staff costing an additional \$6,000.
- b) Assumes that one-half of two full meetings per year would be necessary to institute new regulations under a FMP amendment process, and that staff work to prepare for and to follow-up these meetings would cost an additional \$12,000.
- c) Assumes one-half of one full meeting per year would be devoted to the annual review under framework provisions of a FMP, with preparation and follow-up by staff costing an additional \$6,000.

- 10 Coordination of the plan monitoring team and preparation of the annual review is estimated to require one man-year of effort by Council staff or temporary staff, at a cost of \$30,000. To fulfill its responsibility to monitor the fishery, the Council would incur this cost whether there is a FMP or not.
- 11 State estimated cost for data collection improvements to speed the availability of catch/effort statistics for fishery monitoring.
- 12 Reflects total costs of multi-purpose surveillance of all areas of jurisdiction. Breakdown by fishery or purpose not possible therefore costs not added to total.

D. Numerical vs. Non-Numerical Estimate of OY

As with most fisheries in the western Pacific, the available data are not specific enough to allow the definition of OY for the bottomfish fishery in numerical terms. The scientific research needed for derivation of a numerical OY would require a public expenditure which could not be justified given the present and potential value of the bottomfish fishery.

E. Federal Data Reporting Requirements vs. State/Territory Data Collection

A Federal requirement for logbooks containing catch weight and number of fish by species, fishing effort, location, and other standard information could be established for vessels bottomfishing in the FCZ, with a standard requirement that these logbooks be available for inspection at sea by U.S. Coast Guard or NMFS agents, and be submitted within a few days of landings.

However, this approach would duplicate, to varying degrees, data reporting systems already established by the State of Hawaii and the territories of American Samoa and Guam, some with Federal funding assistance. The Federal government has made an investment in a regional Fishery Information Network (FIN) covering each of the island areas represented by the Council. Rather than duplicate this investment and create a new data reporting burden for fishermen, the Council believes that the established State of Hawaii and FIN data systems should be improved so that they can be relied upon for the annual review of fishery performance. The framework process under this FMP would allow the Council to recommend improvements in the State/Territorial data systems or to recommend that the Regional Director establish a Federal data reporting requirement in the future if initial reliance on State/Territory data reporting proves unsatisfactory for the annual review.

The cost of enforcing universal catch and effort data submission requirements would be prohibitive. Even modest investments to improve FIN in American Samoa and Guam cannot be justified for this FMP because of the small potential yields of the FCZ bottomfish fisheries in those island areas.

The State of Hawaii catch reporting system could provide much of the data for the annual review under the FMP for an additional \$20,000 per year plus a one-time cost of \$65,595.

F. Federal Permit

Although a Federal permit requirement was considered for the FCZ off American Samoa and Guam, it was considered unnecessary because of the small present and potential fishery yields. The State of Hawaii commercial fishing license provides an adequate record of bottomfish fishermen in the main Hawaiian Islands without adding a Federal permit requirement. Although NWHI bottomfish fishermen are also licensed by the State, a Federal permit would serve other purposes that would be difficult to accomplish through State licenses, due to the State's confidentiality laws:

- Issuing permits to particular vessels will provide more accurate tracking of increases/decreases in fishing effort and in entry/exit of fishermen from the large FCZ bottomfish fishery in the NWHI;
- A listing of vessels with bottomfishing permits will allow more effective surveillance by Coast Guard aircraft of the vast NWHI; and
- A permit system would also give the U.S. Fish and Wildlife Service and NMFS a point of contact with bottomfish fishermen and provide an opportunity for education relative to the sensitivity of the area's wildlife and the need for their protection. Furthermore, as part of this system an informational handout for the fishermen has been developed by NMFS to describe and explain the applicable laws and regulations concerning interactions with Hawaiian monk seals and other endangered or threatened species.
- The information requested on the permit application will be considered confidential and is intended to provide additional information needed to assemble a general profile of the fleet's fishing power and present capabilities. The information will be invaluable in making informed rational decisions on any type of management option especially area closure or access limitation options.

G. Benefits and Costs Under Management Alternatives

For the Hawaii cost-benefit analysis, key benchmark data include projections of average monthly bottomfish landings in Hawaii for the years 1990 and 2000. The projections are based on projected increase in Hawaii's residential population. Unpublished analysis (S. Pooley, 1985b) has demonstrated a strong statistical relationship between the increase in average monthly bottomfish landings and population growth during the 1965-1982 period:

TABLE F.5

AVERAGE MONTHLY HAWAII BOTTOMFISH LANDINGS
(1,000 lbs.)

Actual (1965-1982)	Actual (June 1982)	Projected (1990)	Projected (2000)
36.8	54.5	69.8	75.2

The average ex-vessel price for the mixed-species bottomfish catch in Hawaii is also strongly correlated with residential population growth during the 1965-1982 period. Based on the historical relationship, a 10% increase in residential population will increase the average price of bottomfish by 15.5%. Although a 10% increase in landings depresses average price by 2.3% for bottomfish, this historical relationship is overcome by the increases in demand suggested by population growth and by the expectation that export markets will continue to develop for Hawaii's fresh fish products (Pooley, 1985b). Depending on the relative influence of the variables which affect bottomfish price, the future monthly value of the Hawaii fishery (in 1982 dollars) is projected as follows:

TABLE F.6

AVERAGE MONTHLY EX-VESSEL VALUE OF HAWAII BOTTOMFISH FISHERY
(\$1,000)

Actual (1965-1982)	Actual (June 1982)	Projected (1990)	Projected (2000)
76.9	111.7	151.4 - 175.7	234.6-259.4

Additional benchmark data for this analysis are preliminary indications of a long-term decline (30%) in the catch per fishing trip of main Hawaiian Islands' commercial bottomfish fishermen over the decade 1974-1983 (WPRFMC, unpublished data), as well as a 29% decline in the catch per trip of opakapaka in the Northwestern Hawaiian Islands' commercial fishery between 1984 and 1985 (WPRFMC, unpublished data). Catch data provided by fishermen (S. Ralston, NMFS Honolulu Laboratory, unpublished analysis) indicated a 50% decline in the CPUE (pounds per line-hour) of opakapaka at St. Rogatien Bank (in just 4 months of fishing during 1983). Catch data for the Northampton Sea-mount, which is the extreme range of the present fishery in the NWHI, show a drop from 165 opakapaka to 40 opakapaka per fishing day in just 2 months of fishing (Meyer, ms.).

A third set of benchmark data for this analysis is a simulation of the effects of reduced CPUE and increased operating costs on the net revenues of bottomfishing vessels of various sizes (S. Pooley, 1985c). The effect of a decline in CPUE from about 250 pounds per day of bottomfishing to about 200 pounds per day of bottomfishing (20% reduction) would be to reduce the net annual revenue (after costs) for a 40-foot vessel by 66%. The effect of a decline in CPUE from 1,108 pounds per day of bottomfishing to 997 pounds per day of bottomfishing (a 10% reduction) would be to reduce net annual revenue for a 60-foot vessel by 178% (S. Pooley, 1985c). Thus, for a 60-foot vessel simulation, the loss in CPUE of 111 pounds to 997 pounds per day represents the borderline case where the 1,108 pounds per day will net the vessel a profit of \$17,000 whereas, 997 pounds per day will lose the vessel \$13,000 of net annual revenue (S. Pooley, 1985c).

Although the history of the main Hawaiian Islands' fishery does not suggest that bottomfish stocks are subject to a sudden collapse due to recruitment failure, commercial bottomfish landings and presumably fishing effort are at record-high levels in the FCZ. It is believed that the NWHI fishery has expanded rapidly by "fishing down" standing stocks of species which had gone unfished for a long time and which are not capable of a sustainable production which can match the harvesting capacity represented in the present fleet. These conditions require the ability to act rapidly when indicators raise concerns about the fishery, particularly because the biology of these species seems to preclude their rapid recovery, after overharvesting, to levels of commercially-viable sustained production.

If sustained production can be achieved in the NWHI fishery, the present value will increase due to residential population growth and associated increases in the price of bottomfish. According to Pooley (1985c), a 15% increase in residential population projected between 1982 and 1990 should bring about a 19% increase in the average price of bottomfish. If annual production of 500,000 pounds per year of targeted species can be sustained in the portion of the NWHI within reasonable

travel time from the fresh fish market, the fishery will increase in value (ex-vessel) by about \$0.40 per pound (1982 dollars) by 1990 and by about \$0.90 per pound (1982 dollars) by the year 2000. If current levels of harvest can be sustained, the added value would be approximately \$200,000 per year by 1990 and approximately \$450,000 per year by the year 2000. If NWHI bottomfish catch rates decline to the same extent as these in the main Hawaiian Islands' fishery (30%) over the past few years, the annual production would fall by 150,000 pounds, valued (in 1982 dollars) at \$330,000 (Table F.7). Preliminary results from a vessel simulator model (S. Pooley, 1985c) suggest that commercial viability of bottom-fishing operations in the NWHI is sensitive to reductions in catch rates less drastic than 30%. This further emphasizes the need to maintain current fishery yields if possible.

Management efforts which succeed in maintaining the current level of bottomfish production in the FCZ of the NWHI would produce benefits of at least \$500,000 per year by 1990 and \$780,000 per year by 2000 (Table F.7). These estimates can be considered conservative since it does not include benefits to consumers who would not face inflated prices following overfishing and the subsequent reduced supply of bottomfish. Moreover, there is no consideration of the benefits of maintaining a catch size composition favoring larger fish, which produce a greater yield and are more desirable for the restaurant fillet market than small fish. Figure F.1 shows that the size-frequency distinction of the opakapaka catch in the main Hawaiian Islands already favors small fish and without future management the size composition of the NWHI opakapaka catch could be similarly reduced.

TABLE F.7

BENEFITS AND COSTS UNDER MANAGEMENT ALTERNATIVES

I. BENEFITS	
Type of Benefit	Value of Benefit
Prevent long-term decline in bottomfish C.P.U.E. in FCZ of NWHI such as has occurred in MHI.	A 30% decline in CPUE (such as in MHI) is estimated (at 1984 prices) as a loss of \$330,000 (ex-vessel) per year or \$660,000 (wholesale) per year.
Prevent loss of opportunities to market U.S.-caught bottomfish in place of foreign imports.	If resident population of Hawaii increases as projected, the effect on demand should provide for an additional \$200,000 (ex-vessel) or \$400,000 (wholesale) in bottomfish sales per year by 1990 and \$450,000 (ex-vessel) or \$900,000 (wholesale) per year by 2000.

TABLE F.7

BENEFITS AND COSTS UNDER MANAGEMENT ALTERNATIVES
(Continued)

I. BENEFITS	
Type of Benefit	Value of Benefit
Maintain economically-viable opportunities for bottomfishing to avoid bankruptcy and default on commercial and government loans and loan guarantees.	Declines in CPUE as small as 10% for a 60-foot boat bottomfishing in the FCZ of the NWHI could change a net profitable operation (+\$17,000/yr.) to a net unprofitable operation (-\$13,000/yr.). As many as 20 boats representing a combined capital investment of \$4 million could be adversely affected.
Prevent long-lasting or irreversible damage to bottomfish habitat.	Each nautical mile of 100-fathom bank perimeter lost to destructive fishing techniques represents approximately \$1,000 per year (ex-vessel) or \$2,000 per year (wholesale) in lost bottomfish production.
Restore groundfish stocks at the Hancock Seamounts.	If CPUE (trawling) can be restored from <1 MT/hr. to 50% of initial CPUE (6 MT/hr.), at least 5 additional MT could be available for each hour of trawling effort. Valued at 1984 Japanese prices (\$0.35/lb.) for dressed armorhead, this additional catch would represent \$2,500 in increased revenue per hour of trawling ^{1/} .
PRESENT VALUE OF FCZ FISHERY (1984)	Bottomfish \$3.8 million (ex-vessel)/yr. \$7.6 million (wholesale)/yr. Seamount Groundfish \$32,000 (ex-vessel)/yr.
TOTAL BENEFITS (1990) ^{2/}	\$530,000 (ex-vessel) or \$1,110,000 (wholesale) revenue per year. \$4 million in capital investment protected. \$2.5 million (ex-vessel) or \$5.0 million in bottomfish habitat protected from long-lasting or irreversible damage.

TABLE F.7

BENEFITS AND COSTS UNDER MANAGEMENT ALTERNATIVES
(Continued)

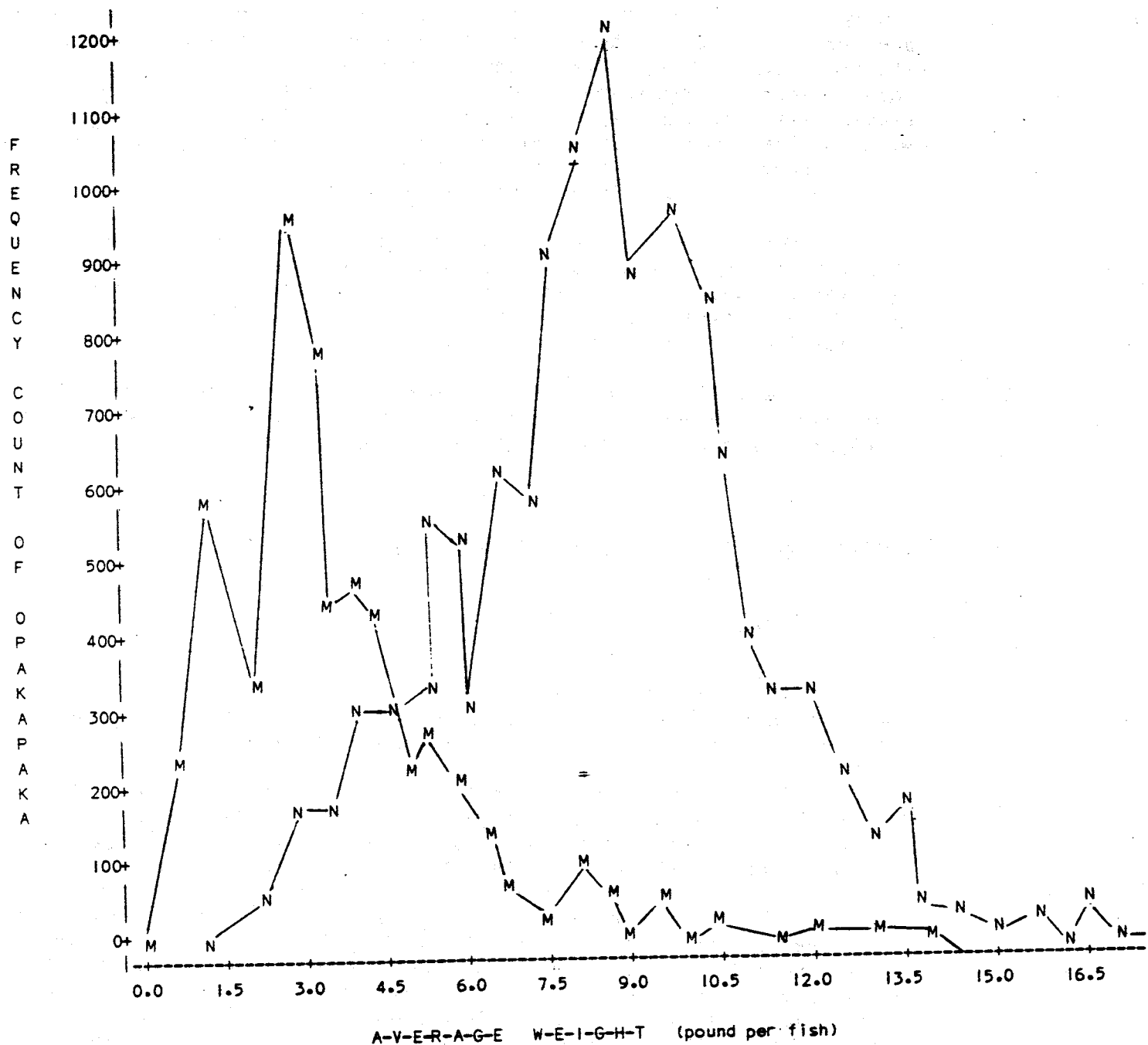
I. BENEFITS	
Type of Benefit	Value of Benefit
	At a level of trawling effort similar to 1984 (90 hours), increase revenue from the Hancock Seamount groundfish fishery by \$2 million per year.
II. COSTS	
Type of Cost	Value of Cost
MANAGEMENT COSTS ^{3/}	\$403,000/year plus undetermined future costs for shoreside enforcement activities if required for regulations promulgated under the "framework" process.
COST UNDER "FRAMEWORK" AS % OF PRESENT VALUE	11% (ex-vessel), 5% (wholesale)
COMPLIANCE COSTS UNDER "FRAMEWORK"	Initially zero because there are no existing domestic net fisheries for bottomfish and there is no existing <u>legal</u> use of poisons or explosives for harvesting bottomfish. Compliance costs could be added as a result of new regulations promulgated under the "framework" process.

Note: ^{1/} Dressed weight of armorhead = 66% of whole weight.

^{2/} Does not include potential benefits to consumers who would face inflated prices following overfishing and subsequent reduced supply of bottomfish or the benefits of maintaining a larger catch size composition which is preferred for the restaurant market.

^{3/} Does not include Coast Guard enforcement costs. Coast Guard costs reflect multipurpose surveillance of all areas. Breakdown by fishery or purpose not possible, therefore, costs are not included in total.

FIGURE F.1 SIZE DISTRIBUTION OF OPAKAPAKA CATCH, MAIN HAWAIIAN ISLANDS VS. NORTHWESTERN HAWAIIAN ISLANDS, JANUARY - MAY, 1985



NOTE: 2 OBS Hidden

M = Main Hawaiian Islands
N = Northwestern Hawaiian Islands

It will be difficult, if not impossible, to maintain or increase the value of the NWHI bottomfish fishery solely by relying on State laws. Not only is the approval of new legislation a lengthy and costly process, but at least one-third of the vessels currently bottomfishing in the NWHI are registered out-of-state. The catcher/processor vessels involved in the NWHI lobster fishery make incidental catches of bottomfish. These vessels are also registered predominantly out-of-state and would not necessarily land their mixed-species catch entirely in Hawaii. Thus, existing State measures and the processes for establishing new State laws may not provide long-term protection of the FCZ bottomfish fishery, especially if the fish are landed and sold elsewhere.

The result of maintaining the status quo (no Federal action) could, in extreme circumstances, lead to a reduction in the potential of fish assemblages to reproduce themselves. More than likely there would be a shift in catch composition toward smaller-sized heavily targeted fish and lower-value species.

The preferred approach to management is a cooperative State/Federal scheme involving joint assessment and monitoring followed by respective action to implement the indicated management action.

F.2 Seamount Groundfish Alternatives Evaluated

A. PMP vs. Framework FMP

The first basic choice facing the Council was whether to (1) continue management of the seamount groundfish fishery through the existing PMP; or (2) place the fishery under the FMP.

The PMP states that, due to the almost complete absence of information on seamount resources, the fishery is regarded as experimental and that the goal of the plan is to obtain a better estimate of maximum sustainable yield (MSY). The PMP was not effective in preventing armorhead stock collapse, and a definitive estimate of MSY is still not available. By including the Hancock Seamounts in the annual review and framework rule-making process under the FMP, OY can be redefined and regulatory adjustments (Figure 3.1) can be made as new information becomes available. This will provide greater flexibility than the fixed determination of OY and annual allocations of TALFF under the PMP. The administrative costs of continuing the PMP or managing the fishery under the FMP are not likely to differ greatly, but management can be more responsive to new information under the FMP.

B. Quotas vs. Moratorium

A second basic choice facing the Council was whether to continue to manage the FCZ seamount fishery through quotas or to impose a complete moratorium on commercial fishing in the FCZ. Foreign fishing quotas have not been effective in maintaining sustained yields of pelagic armorhead at the Hancock Seamounts.

The effect of continuing the present allocation of up to 1,000 metric tons per year to Japan or other nations is likely to be a further depression of the armorhead stocks at the Hancock Seamounts. Alfonsin stocks may also be depleted if foreign harvestors shift to this alternative target as they have in the portion of the seamount fishery outside the FCZ. Managing the FCZ portion of the seamount fishery by limiting total fishing effort rather than total harvest would have only minor effects on the overall levels of pelagic armorhead in the Emperor Seamounts because populations on different seamounts are probably not separate stocks.

A temporary moratorium on all fishing could be implemented as a scientific investigation to learn more about stock recruitment and recovery, while foreign harvesting continues at seamounts outside the FCZ. The benefits include rebuilding of the Hancock Seamount population and better scientific understanding of the population dynamic of the seamount species through comparison of exploited and unexploited populations of pelagic armorhead and alfonsin. Further, even a single seamount may serve as a reproductive refuge, enhancing recruitment to other seamounts. This could guide an international plan of management for the common resource.

The chief benefit of allowing foreign harvesting to continue at some level in the FCZ portion of the seamount fishery would be continued availability of catch/effort data for the Hancock Seamounts. No increase in Federal responsibilities or costs are expected which differ from those incurred under the existing Preliminary Fishery Management Plan for Seamount Groundfish, except for the cost incurred by the Honolulu Laboratory of NMFS in conducting the Seamount Resources Study.

The moratorium would terminate foreign harvesting and foreign fishermen who continue to fish outside the FCZ who might retaliate by refusing to provide catch/effort data which will be necessary to understand the population dynamics of stocks on a regionwide basis. No increase above current levels of foreign fishing surveillance and enforcement by the U.S. Coast Guard is expected under this alternative.

If the moratorium is successful in rebuilding groundfish stocks at the Hancock Seamounts, long-range domestic fishermen may be able to exploit a new fishery or the value of the fishery for foreign "fish and

chips" trade agreements would be enhanced. If the moratorium is successful, CPUE in the trawl fishery (if re-established) might be sustained at 50% of the initial CPUE in 1978 (12.5 metric tons/hr.) when the Seamount Groundfish PMP was first implemented. If a sustained CPUE of 6 metric tons/hr. could be achieved, this would represent a great improvement over the CPUE of 0.42-0.79 metric tons/hr. in 1983-84.

APPENDIX G

**COMMENTS ON THE
DRAFT BOTTOMFISH AND SEAMOUNT GROUND FISH FMP
ENVIRONMENTAL ASSESSMENT
AND
REGULATORY IMPACT REVIEW**

**COMMENTS ON THE DRAFT BOTTOMFISH AND SEAMOUNT GROUND FISH
ENVIRONMENTAL ASSESSMENT AND REGULATORY IMPACT REVIEW**

This appendix summarizes oral and written testimony on the draft Bottomfish and Seamount Groundfish FMP Environmental Assessment and Regulatory Impact Review submitted for public review. The draft was reviewed at six public hearings conducted on Kauai, Oahu, Maui and Hawaii. In addition, letters were received from government agencies, environmental organizations, and private interests. The section below summarizes comments, oral and written, provided during the review period, followed by responses of the Bottomfish/Seamount Groundfish Plan Development Team. Comments suggesting editorial rather than substantive changes have been accommodated in the final FMP and are not listed below.

Summary of Public Comments With Responses

1. Comment: What will be the make up of the monitoring team?

Commenters: Fishermen.

Response: The composition of the Team will be decided by the Council. The members will include representatives of the Honolulu Laboratory (NMFS), the Division of Aquatic Resources (DLNR), fisheries and endangered species scientists, fishery managers, and industry representatives (fishermen/dealers).

2. Comment: Of the many indicators that will be used, how many will have to be triggered to set off a red light and will each island have its own indicators?

Commenters: Fishermen.

Response: The management unit species in the main Hawaiian islands will be considered as part of one stock. Therefore, no individual island will have a unique set of indicators. A single indicator on any one of the management unit species will be sufficient to warrant an investigation by the Plan Monitoring Team, which will possibly lead to recommendations for management action.

3. Comment: Will the (Plan Monitoring) team consider only the FCZ or the whole fishery?

Commenter: Fisherman.

Response: Due to the fact that bottomfish stocks in the territorial seas and the FCZ are inter-related, the Team will investigate all problems whenever possible.

4. Comment: How can you tell where the fish are being caught? A NWHI catch may get sold on Kauai or a catch off Maui by a Honolulu boat may be sold in Honolulu.

Commenter: Fisherman.

Response: The State of Hawaii requires the commercial fishermen to submit catch reports. The form includes the area fished and the port of landing. Aggregated totals of catch by area are available.

5. Comment: There is no sense in setting something up that can't be enforced.

Commenter: Fisherman.

Response: Without any form of law or regulation, there can be no enforcement. If there is a law or regulation, that is the first step towards enforcement.

6. Comment: How much of the main Hawaiian islands bottomfishing grounds is in the FCZ?

Commenter: Fisherman.

Response: There is approximately 260 nautical miles of 100-fathom isobath within the FCZ of the main Hawaiian islands as opposed to 737 nautical miles within the State's jurisdiction.

7. Comment: If (Federal) regulations are instituted in the future for the MHI, would they only pertain to the FCZ? How will the State respond? Will it adopt similar regulations? Which law supercedes the other?

Commenter: Fisherman.

Response: Under the Magnuson Act, the Secretary of Commerce has the authority to regulate the fishery, beyond the FCZ, i.e. State/Territorial waters, if the fishery is predominantly in the FCZ and beyond such zone and where action or inaction by the State will substantially and adversely affect the implementation of the plan. Undoubtedly, the State will oppose any attempt by the Federal government to extend its jurisdiction and authority or to diminish the State's jurisdiction and authority. The question of Federal preemption of the State's right to manage the bottomfish resources and fishermen around the MHI seems moot because most (74%) of the bottomfish grounds are within State's waters. The Federal government would find it difficult to justify preempting the State in order to manage the small portion (26%) of the bottomfish habitat under its purview around the main Hawaiian islands.

8. Comment: Has there been any trawling or gillnetting in Hawaiian waters?

Commenter: Fisherman.

Response: There has been at least one attempt to trawl for bottomfish as well as several peneid shrimp trawling operations. Gill netting with trammel nets have also been experimented with. These methods were subsequently discontinued as the rugged topography produced large amounts of gear loss.

9. Comment: Can't you stop foreign trawling indefinitely, longer than 6 years? Could a moratorium on trawling at seamounts enhance armorhead stocks in the NWHI? Who will do the fishery surveys during the moratorium?

Commenter: Fisherman.

Response: Due to the depressed nature of the armorhead stocks within the U.S. FCZ, a 6-year moratorium is being requested. During this time, the Honolulu Laboratory will conduct a Seamount Resources Study which will monitor the recovery of the resources. After the results of the study are analyzed, a decision on whether or not to open up the fishery will be made. If a decision to reopen the fishery is made and an optimum yield is re-established, unless domestic fishermen establish a fishery, the foreign vessels will be allowed to fish the groundfish stocks up to a Total Allowable Level of Foreign Fishing (TALFF).

10. Comment: We have reservations about recommendations that the Council will make on our behalf. We have been railroaded before at public hearings to set up reserves here on Maui. A group of Council people will make a study and recommendations, meanwhile we have no guarantees. I would like to see how these people are selected, what their interests are. I would hate to see these people recommend restricting our catches. Do we have guarantees against something like this?

Commenter: Maui Bottomfisherman.

Response: Fisheries management recommendations made by the Council (WPRFMC) are the result of broad base input and careful deliberation. The Council relies heavily on input especially from the fishermen themselves. In formulating fisheries management plans, the Council is assisted by a scientific/statistical committee as well as an advisory panel which membership includes representation from user groups and interests concerned with the management of the fishery. The Council cannot guarantee the preclusion of management measures that would restrict or prohibit catches or fishing activities.

11. Comment: We'll always be getting a red light indicator while the Leeward (NWHI) guys will always have a green light because only so many boats can

fish down there. They'll always have a green light but we'll always have a red light that is going to cause you folks to put on more restrictions and we're going to be limited while people going to the NWHI are going to get the green light all the time.

Commenter: Maui Bottomfisherman.

Response: Due to large numbers of fishermen in the main Hawaiian islands (MHI), the pressure on all bottomfish stocks, in particular opakapaka, is great. Preliminary evidence show that indeed at least one red light indicator may have already been triggered. It is highly unlikely that the Council (WPRFMC) will institute any Federal regulations for the MHI bottomfish fishermen because most of the bottomfish grounds are within State jurisdiction. It is most likely that if an indicator in the MHI is triggered that the Council's Bottomfish Monitoring team will investigate and recommend management actions to the Council for State consideration.

At the present time, there is no access management plan being proposed for either the MHI or the NWHI. Access management is an option along with many others that will be considered when an indicator is triggered. Fishing pressure in the NWHI's is increasing and the opakapaka stocks in some areas are showing signs of stress.

12. Comment: Is there a standard grading level on (bottomfish) quality?

Commenters: Bottomfish Fisherman.

Response: At the present time there are no mandatory quality grading or inspection for domestic products, bottomfish included. The auction system as well as the markets and dealers themselves do provide an incentive for quality fish. The better the quality the higher the ex-vessel price paid for the fish.

A voluntary seafood inspection service is available for a fee by the U.S. Department of Commerce (USDC). Inspection is to USDC and the Food and Drug Administration (FDA) requirements. There are basically four services available: an in-plant inspection service; a lot inspection service; export inspection service; and a miscellaneous service. Under the in-plant inspection service a "Packed Under Federal Inspection" (PUFI) service is available under which is a product grading service. Products packed under these inspections and grading processes meets the U.S. Grade Standards and can bear the U.S. Grade marks.

13. Comment: If we're going to be on top of these biological indicators, let's have a Federal reporting requirement from the start. Why wait to find out State system proves inadequate? We've had a state system for years and years that doesn't seem very adequate. I'm under the impression that the data are confidential.

Commenters: Maui Sea Grant Agent.

Response: The FMP will rely on the existing Federal/State data collection system. Using and improving the existing data gathering systems will be more cost-effective and eliminate any additional double reporting burden on the fishermen. A Federal/State agreement on data access should provide timely data management and analysis. Data are considered confidential in this agreement and will be transferred without inclusion of any commercial fishing license number.

Summary of Agency Comments

1. Comment: A statement should be added on pages 94 and 115 saying that one of the measures that the Council may choose to implement through the framework process it is establishing is a rule-related notice system (previously known as a field order system) in order to respond very rapidly in certain management areas (such as changing trip limits or open and closed seasons in response to rapidly changing information). While I do not think that the absence of this statement in the FMP would prevent the Council from doing this anyway, the statement does alert everyone that the Council is aware of this option and may put it into place using the framework system if appropriate.

Commenter: NOAA General Counsel S.W., NMFS S.W. Region.

Response: The rule-related notice system has been added to the list of management alternatives for Council consideration (Section 2.2.1 and 6.2).

2. Comment: The process of appealing an adverse decision of the Regional Director of NMFS in regard to a rulemaking action recommended by the Council can be improved upon (see pp. 103, 105). The requirement of publishing the assistant administrator's decision in the Federal Register is overkill, in that a letter from the AA to the Council would seem to suffice. Also, if there is going to be an explicit appeal provided for in the FMP, it should be limited to the Council as a body, since it is the Council's action which is the subject of the appeal. Providing for an appeal does seem redundant, however, because the Regional Director would be exercising authority delegated to him from the AA, and we would coordinate any actions with the AA.

Commenter: NOAA General Counsel S.W., NMFS S.W. Region.

Response: Section 6.2.1 Annual Review has been reworked as suggested by the NOAA General Counsel S.W., to better reflect the process by which the Council may appeal the Regional Director's decision in regard to rule making action.

3. Comment: The discussions on the use of trawl gear and bottom-set net gear on pp. 2, 3, 15 and 91 are confusing in their reference to gill nets, since as I understand gear types, not all gill nets are bottom-set nets. It would also help if the FMP clearly stated to what extent, if any, there are any domestic fisherman using this type of gear in the NWHI's and to what extent they would be affected by a ban on this gear.

Commenter: NOAA General Counsel S.W., NMFS S.W. Region.

Response: It is true that not all gillnets are bottom-set but any gill net gear that will be used to harvest bottomfish species will necessarily have to be set on or near the bottom. Although there have been several attempts to use trawl gear and bottom-set gillnets to harvest bottomfish in the Hawaiian islands, all attempts were voluntarily halted due to gear loss. At this time, there are no vessels currently utilizing these gear types (Section 2.2.2.1, 3.1, 5.2.1, 5.4.4, and 6.1.1).

4. Comment: The DAH discussion should include a statement of how much of the fish covered by the plan are actually expected to be harvested by U.S. fishermen, and the absence of TALFF explicitly justified if there is a gap between DAH and OY (p. 22). Expected growth in U.S. catches and a desire to make the fishery attractive to prospective U.S. fishermen is a reason which has been used in other plans to deal with this issue. Adjustments to the OY to take into account this objective would be appropriate.

Commenter: NOAA General Counsel S.W., NMFS S.W. Region.

Response: The DAH and OY are defined in non-numeric terms as the quantity of each management unit species that will be caught by domestic vessels in the FCZ under the management measures implemented under the FMP to achieve to the greatest extent practicable, the management objectives. In the bottomfishery, the harvest capacity of the existing fleets is sufficient to take the entire MSY in all areas. Therefore, there is no gap between DAH and OY.

5. Comment: Need for the FMP - Headquarters staff do not question the need for the FMP but note that Section 3.2 could be strengthened in two ways. First, a summary of the pace of growth of Hawaii's bottomfish fisheries and a brief discussion of the "indicators" which raise concerns could be added. Second, the section could be combined with 3.4 and could reference the management problems and objectives discussed in more detail in Sections 4.3, 4.4, and 5.4. Whatever factual or logical justifications can be further articulated for the need for the FMP, for the gear bans, and the moratorium on the seamount groundfish fishery, would probably aid in getting the plan approved.

Commenter: NOAA General Counsel S.W., NMFS S.W. Region.

Response: Section 3.2 Need for FMP has been reworked to provide more data and a stronger discussion on the trends in the bottomfish/seamount groundfish fishery.

6. Comment: We support the administrative framework process outlined in the draft FMP and its intent to provide for timely and cost-effective management response. However, our support for the framework process should not be construed as registering our approval for each of the management options described in section 6.3- We acknowledge the various management measures as options for future consideration, but subject to further review when action is proposed. For example, in the proposed access limitation management option, the establishment of August 7, 1985, as the firm cut off date for designing a specific limited entry proposal should be tied to reasonable criteria.

Commenter: NMFS S.W. Region.

Response: When considering any of the management options in the future, the Council will investigate the acceptability and mechanics of the proposed management option. August 7, 1985 was established by the Council at its 50th Meeting, held August 5-8, 1985, as a cutoff date for participation in the NWHI bottomfish fishery if an access management measure is implemented in the future. This date was chosen by the Council to prevent a large influx of speculative entrants into the NWHI fishery (Section 6.3.5).

7. Comment: It might be helpful if the annual report outline explicitly included reference to recreational fishing catch and effort data. This could be a clear charge to NMFS to work with State and Territory agencies to develop a recreational fisheries data base.

Commenter: NMFS S.W. Region.

Response: Agreed and the necessary changes have been made in Section 6.2.1 and 10.1.1 under Fishery Performance Data. Section 4.5.7 (Sources of Data) lists the NMFS recreational fishing data that have been collected. Recreational fishing data have not been collected in all areas and in some areas may comprise a significant amount of harvested bottomfish. However, annual compilation of recreational fishing data (which also should include the subsistence component) could be prohibitively expensive.

8. Comment: Authorization in the FMP for the Regional Director to implement Federal data reporting requirements if he determines in consultation with the Council and State and Territory agencies, that State and Territory data reporting requirements and voluntary data collection programs are not providing the data needed to effectively monitor the FMP.

Commenter: NMFS S.W. Region.

Response: Data collection is being accomplished through already established Federal/State/Territory networks. It is felt that though this system of reporting may require some improvements, it may be preferable and more cost-effective to determine if the existing systems will function effectively than imposing a Federal data reporting requirement and its attendant increased cost and risk of double reporting. Therefore, the Council would like to utilize the established data networks but reserve the right to request that the R.D. implement a Federal reporting requirement should it become necessary.

9. Comment: To obtain the catch/effort data required for effective monitoring and timely management response...a requirement that all NWHI permit holders file catch reports as required by State law.

Commenter: NMFS S.W. Region.

Response: The State of Hawaii already requires all holders of Commercial Marine Licenses (State commercial fishing licensees) to file a catch report form (Appendix D) 10 days after the end of each month. In 1985, the State law was amended specifically to allow the Hawaii Department of Land and Natural Resources to enter into cooperative agreement with U.S. government agencies in order to exchange confidential fisheries information for resource management purposes. A NMFS - State of Hawaii cooperative data sharing agreement, which is currently being developed, will provide access and analysis of bottomfish catch/effort data to be done in a timely manner.

10. Comment: The draft FMP notes that the FCZ includes waters around the CNMI but no management measures are proposed. This is understandable given the political realities concerning the CNMI position on the FCZ, the non-participation of the CNMI on the Council and the absence of any NMFS guidance on the subject to date. We propose, however, that the FMP clearly state at the beginning of the plan and the U.S. position regarding the applicability of the MFCMA to the CNMI and the Council's reasons for not recommending management measures in this part of the FCZ.

Commenter: NMFS S.W. Region.

Response: Agreed. Section 2.1 now includes the statement "Although the FCZ includes waters off the Northern Mariana Islands and miscellaneous U.S. island possessions, the plan proposes no management system for the FCZ in those areas because of the relatively undeveloped status of the deepsea bottomfish fishery".

11. Comment: Moratorium on Seamount Groundfish. The FMP sets an OY for seamount groundfish at zero (0) but establishes a moratorium only on commercial trawl fishing for a period of six years. This approach would

allow domestic or foreign longlining or hook-and-line fishing on a depressed stock. To remedy this contradiction and provide added flexibility, we propose that the moratorium be complete but allow experimental fishing under permit for those who may want to try non-trawl or trawl gear under controlled circumstances. The draft FMP describes details of the moratorium on the seamount groundfish.

From the Honolulu Laboratory's perspective, we would prefer a total ban of commercial fishing with any types of fishing gear on the seamounts, and that monitoring and experimental fishing be conducted under the complete control of NMFS (Southwest Fisheries Center). Substantial deviation from this may result in difficulty for Center scientists to assess the impact of the prohibition of fishing on the seamount resources.

Commenter: NMFS S.W. Region, NMFS Honolulu Laboratory.

Response: The Council agrees on a moratorium on commercial fishing for seamount groundfish for the FCZ of the Hancock Seamounts. At its 51st meeting, the Council voted to include the moratorium in the proposed actions of the FMP. Recent evidence from the NMFS has established the effectiveness of bottom longline gear in the harvest of seamount groundfish on depressed stocks. It is highly possible that a large longliner could do a great deal of damage to the present stock as the seamount area is highly limited.

12. Comment: NWHI Bottomfishing Permit. The FMP proposes to establish a Federal permit requirement for bottomfishing in the FCZ of the Northwest Hawaiian Islands. Reference to this requirement should be included in the preface to the FMP. The FMP establishes a permit requirement for the NWHI only, but the draft application identifies 4 permit areas to choose from. No explanation is provided in the FMP.

Commenter: NMFS S.W. Region.

Response: The Federal permit requirement for bottomfishing in the FCZ of the NWHI is already included in the preface under immediate actions (Section 2.2.2.4). In Section 2.2.1, Framework for Future Actions, a permit and/or catch reporting requirements for the FCZ refers to a potential for implementation in other areas of the Council's jurisdiction. The draft permit application showed this consideration but since a requirement for just the NWHI is proposed initially, the draft application (Appendix A) has been changed to reflect this. If a permit requirement for other areas of jurisdiction is deemed necessary at a later date, the form will be amended.

13. Comment: The FMP provides no explanation of the need for such vessel information as beam length, fuel capacity, cruising speed, range, horsepower, purchase price, purchase date, etc. There is no readily apparent need for this information, some of which appears to be confidential, and

without adequate justification cannot be included in a permit application.

Commenter: NMFS S.W. Region.

Response: The information requested on the permit application form will be considered by all parties to be confidential. The information will be used to generate a profile of the bottomfishing fleet's capabilities as to range, refrigeration capabilities, and the ability to switch fisheries or do multi-fishery activities. To evaluate the many forms of management available under the framework process, information such as this is needed. Changes in Section 2.2.2.4, 6.1.4, 6.3.5, and Appendix F reflect this view.

14. Comment: The Council should consider whether a fisherman with a commercial license should be prohibited from possessing an undersized fish in the FCZ around Hawaii. We recognize that this may create a problem of consistency with State law.

Commenter: NMFS S.W. Region.

Response: The State of Hawaii's law does not prohibit possession of an undersized fish by the fishermen. The law is on the sale of the fish by the fishermen and the sale or possession of the fish by a dealer. Therefore, no inconsistency should result.

15. Comment: The FMP prohibits the use of bottom trawls, bottom-set nets, explosives, and poisons for fishing, and for enforcement purposes (p. 148), prohibits bottomfish vessels from carrying restricted gear on board. The Council may wish to consider the desired scope of the prohibition. Presumably, the FMP will allow bottom trawls in the Seamount fishery after 1990.

Commenter: NMFS S.W. Region.

Response: A commercial fishing moratorium for seamount groundfish in the FCZ of the Hancock Seamounts has been proposed as an immediate action. During the 6-year period, a reassessment of the stocks will be performed and the decision to open the fishery will be evaluated. If the fishery is to be reopened then an amendment will be made to reflect the changes and permitted gear-types will be allowed on vessels harvesting seamount groundfish. An addition to Section 10.2 has been added to reflect this view.

16. Comment: Enforcement Costs. Clarification of the information in Table 10.1 (p. 147) would be helpful. First, it should be noted the data include the cost of surveillance for the possessions and CNMI, which are not covered in the FMP. Second, it should be made clear whether the

"hours per patrol" column includes only surveillance time or presents total hours flown including transit to and from Hawaii. Third, it should be emphasized that aerial patrols are multi-fishery and multi-purpose; fisheries surveillance may be an important purpose but is not the only purpose. As presented, the Table could be incorrectly interpreted to show Coast Guard costs under the FMP.

Commenter: NMFS S.W. Region.

Response: Table 10.1 (Section 10.2) has been altered by eliminating surveillance costs for the possessions and the CNMI. The text emphasizes that these patrols are multi-fishery and multi-purpose and stresses that for these reasons, Table 10.1 should not be interpreted as Coast Guard costs under the FMP.

17. Comment: It is difficult to understand the statement that net annual revenue could be reduced 178% with a 10% decline in CPUE, as written on p. 193. Clarification is needed.

Commenter: NMFS S.W. Region.

Response: Preliminary results from the vessel simulator model (S. Pooley, 1985c) suggest that commercial viability of bottomfishing operations in the NWHI is sensitive to reductions in catch rates of less than 30%. Thus, at a CPUE of 1,108 pounds per day, the corresponding net annual revenue for a simulated bottomfishing operation would be \$17,000 whereas a 10% reduction to 997 pounds per day would correspondingly result in a net annual loss of \$13,000 which equals a total loss of 178% (Appendix F, F.1.3).

18. Comment: The last paragraph on page 195 should be reworded to describe more clearly the "conservative" nature of the estimated benefits of maintaining NWHI bottomfish production. It appears the benefit is due to the fact that consumers would not face inflated prices following overfishing and subsequent reduced supply of bottomfish.

Commenter: NMFS S.W. Region.

Response: It is agreed and the sentence "These estimates can be considered conservative since it does not include benefits to consumers who would not face inflated prices following overfishing and subsequent reduced supply of bottomfish" was inserted into the paragraph (Appendix F, F.1.3).

19. Comment: The Council may wish to consider an allowable take for recreational or direct consumption purposes by non-permitted vessels transiting or fishing for other species in the NWHI FCZ.

Commenter: NMFS S.W. Region.

Response: The TALFF for bottomfish species is set at zero (0) (Section 3.6.4, 8.4) because the present domestic harvesting capacity is capable of taking the entire MSY of the various areas. In the NWHI, recreational fishing for bottomfish is zero (0) due to the distance factor. Non-permitted vessels, i.e. lobster vessels, do make incidental catches of management unit species (Section 5.2) but the catches are considered to be low in comparison to the total production of the fishery. The incidental catches by non-permitted vessels are not foreseen to increase appreciably in the future as the lobster fishery is also controlled. To this end, no official allowable take has been established at this time.

20. Comment: My first comment relates to the incorporation of the State of Hawaii regulations regarding a 1 lb. size limit for sale or possession by dealers. Although it may be essential that some action like this be taken to maintain consistency with State regulations under Coastal Zone Management (CZM) rules, it seems incongruous to incorporate this specific size limit when biological justification is included in the draft FMP for a 3 lb. size limit for selected species. I understand that the Hawaii Department of Land and Natural Resources is continuing its attempts to increase the size limit by legislative action. It might thus be desirable to include specific language in the draft FMP to indicate that it is desirable to have a larger size limit and the incorporation of the existing 1 lb. state limit is temporary until the state adopts a larger size limit.

Commenters: NMFS Honolulu Laboratory

Response: At the Council's 51st meeting this particular subject was examined. The State of Hawaii felt that to propose a complimentary size limit in the FCZ may hamper its efforts to increase the current state size limit to 3 pounds. A motion to go ahead with the FMP and to include access limitation as a management option was amended to also eliminate the proposed complementary Federal regulations on a one pound size limit for sale by fishermen and sale or possession by dealers. The motion as amended was accepted by the Council.

21. Comment: Data collection. Preparation of an annual report, and the role of the plan monitoring team. The plan does not indicate what agency will have responsibility for collecting the specific data required to produce the annual report, who will manage the data, and who will do the analyses and produce the summaries. The makeup of the plan monitoring team should be stated in terms of agencies as well as expertise. I believe this is an important area of the draft FMP and needs to be worked out in more detail. Incidentally, I was under the impression that NMFS had the responsibility of assembling the statistics, providing computerized data management, data analysis, and preparation of an annual report on the

status of the fishery. Based on the draft FMP it appears that the Council's plan development team would assume these responsibilities and also provide recommendations for management action to the Council.

Commenters: NMFS Honolulu Laboratory

Response: The plan states that data collection will continue through established channels. Federal/State/Territory data management, summaries, analysis, and research reports for the Plan Monitoring Team (PMT) use will be provided for by the NMFS Honolulu Laboratory (Section 6.2.1, 10.1.1, and 10.1.2). The PMT will be responsible for the Annual or Special Report which includes recommendations for Council action. The PMT will be made up of representatives from the Honolulu Laboratory (NMFS), the Division of Aquatic Resources, fishery and endangered species scientists, fishery managers, and industry representatives (fishermen/dealers).

22. Comment: Cost of management under the FMP - Headquarters staff indicated that the "annual cost" of the framework approach (p. 198) appears excessive for the value of the fishery. You may recall that my staff similarly had pointed out that the method or basis for estimating management costs needs to be described. This could include comparisons of agencies' programs and activities under current conditions and under the FMP and of administrative costs and timing under a conventional FMP (i.e., periodic amendments) and the proposed framework approach. A summary of this information could be added to Sections 2.2 and 3.7.

Commenter: NMFS S.W. Region.

Response: The annual cost of management for the responsible agencies was estimated (Appendix F, F.1.3) under No FMP, Framework FMP, and Conventional FMP.

23. Comment: The FMP should identify research and monitoring efforts to avoid the possibility of adverse effects on monk seals and other endangered species.

Commenter: Office of Protected Species and Habitat Conservation, Marine Mammal Commission.

Response: The Council feels that endangered species research and monitoring efforts fall under the purview of the various endangered species agencies.

24. Comment: The FMP should identify steps that would be taken to make sure that bottomfish fishermen are aware of potential interactions and regulations necessary to protect monk seals and other endangered and non-endangered species.

Commenter: Office of Protected Species and Habitat Conservation, Marine Mammal Commission.

Response: The Federal Bottomfishing permit (Sections 2.2.2.4 and 6.1.4) would provide a point of contact between the NMFS and the U.S. Fish and Wildlife Service and the NWHI bottomfish fishermen. It would indeed be desirable to distribute an information document developed by these agencies along with the Permit application. Information on the applicable laws and regulations concerning the threatened and endangered species of the area and a statement that the applicant has read the applicable laws, regulations, and penalties regarding the capture, killing, or harassment of Hawaiian monk seals or other endangered or threatened species could be included.

25. Comment: Experimental fishing permits can be issued to allow testing under controlled conditions to determine if habitat damage, protected species interactions, marketing problems, or other problems would result if such gear were permitted in the future (in 6.1.6).

Commenter: NMFS S.W. Region.

Response: Experimental fishing permits (EFP) for domestic fishermen are allowed for in the FMP under immediate actions (Sections 2.2.2.5, 3.1, 6.1.5). The Council proposes that the regulations implementing this FMP include a system for issuance of EFPs, under Section 303(b)(1) of the MFCMA, with the criteria and procedures to be determined by the Regional Director in consultation with the Council.

26. Comment: The March 1985 draft FMP indicated that bottomfish less than one pound in weight make up a small percentage of total commercial landings (in numbers of fish) and therefore the minimum size will have relatively little impact on commercial revenues (and in fact should have no impact if the State size limit were fully enforced). A summary of this information on impacts could be added to 2.2 and 3.7.

Commenter: NMFS S.W. Region.

Response: Data indicated that early in 1984, 30% by number of the ehu (Etelis carbunculus) sold from the MHI was under one pound in weight. The State of Hawaii does not include ehu in its one pound for commercial sale law. Therefore, there would be no impact on the current commercial fishing community. The Council at its 51st meeting passed a motion to eliminate the complementary Federal one pound for sale by fishermen and sale or possession by a dealer regulation.

27. Comment: It is not clear whether the Council-appointed bottomfish monitoring team will include scientists and managers with knowledge and responsibilities relative to the Hawaiian monk seal and other endangered or threatened species. Will the Monitoring Team and its annual report include consideration of information and problems concerning the protection of endangered and threatened species?

Commenter: Marine Mammal Commission.

Response: The Bottomfish Plan Monitoring Team (PMT) will include representation from the protected species agencies. The PMT under Section 6.2.1B 12 and 6.2.1B 14 will consider information and reported interactions between bottomfishing operations and protected species.

28. Comment: As drafted, it is not clear whether the Council is proposing that the criteria and procedures to be used to issue experimental fishing permits be established by regulation, or only that the general regulations that presently apply to implementation of the Fishery Management Plan include provisions for issuing experimental fishery permits. The advantages of establishing criteria and procedures, by regulation, would appear to outweigh the possible disadvantages and the Fishery Management Plan should be revised to provide a clearer indication of what is being proposed. In addition, Endangered Species Act recovery teams as well as the Fishery Management Council should be consulted by the Regional Director of the National Marine Fisheries Service to obtain their views concerning the criteria and procedures for issuing experimental fishing permits.

Commenter: Marine Mammal Commission.

Response: The Council proposes to rely on the Region to draft the proposed regulations. The Region will obtain input from all areas of expertise.

29. Comment: It would be appropriate and desirable for the Regional Director of the National Marine Fisheries Service to consult with the Fishery Management Council and any other interested or knowledgeable persons or organizations, such as endangered species recovery teams, to help assess the possible significance of any reported taking of monk seals or of other threatened or endangered species.

Commenter: Marine Mammal Commission.

Response: Agreed, after consultation with the various agencies, etc. that the decision to reinstitute Section 7 consultations rests with the Regional Director of the National Marine Fisheries Service. The appropriate language has been inserted in Section 6.2.1 B14.

30. Comment: Section 5.4.8 does not address other possible adverse interactions between endangered or threatened species and bottomfish fishing operations. Although currently available information concerning the nature, location, extent, and effects of such interactions is not sufficient to provide a thorough understanding of the magnitude of possible problems, these concerns should be referenced in this section.

Commenter: Marine Mammal Commission.

Response: Section 5.4.8 has been changed to reflect concern on the interaction of endangered and/or threatened species with hooks and fishermen as well.

31. Comment: It is indicated that a number of non-endangered and non-threatened species, as well as endangered and threatened species, of marine mammals are present in the Western Pacific Region. If there is a possibility that any of these non-endangered or non-threatened marine mammal species could be "taken" incidentally during fishing operations or related activities, the FMP would not be consistent with the provisions of the Marine Mammal Protection Act unless an incidental take permit or small take exemption has been issued. Therefore, this section of the FMP should be expanded to indicate why no non-endangered or non-threatened marine mammal species are expected to be taken, or, alternatively, to indicate what steps have been or will be taken to obtain the necessary permit or exemption. In addition, it would be desirable and appropriate to include a provision in the FMP calling upon the Regional Director of the National Marine Fisheries Service to investigate reports of the incidental taking of non-endangered and non-threatened, as well as threatened and endangered species of marine mammals.

Commenter: Marine Mammal Commission.

Response: Section 9.2 addresses the relationship of the Marine Mammal Protection Act to the FMP. Although there has not been any documented cases of incidental mortality of any of the species listed on Table 9.1 throughout the history of commercial fishing in Hawaii some evidence does exist that potentially detrimental interactions between fishing operations and protected species is possible. It is felt that the available information concerning these interactions is not sufficient to provide a thorough understanding of the problem. Therefore, due to the infrequent nature of interactions, research by the appropriate agencies should be conducted to ascertain the need for any incidental take permit or small take exemption.

APPENDIX H

NMFS LETTER REQUESTING MORATORIUM



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southwest Region
300 South Ferry Street
Terminal Island, California 90731

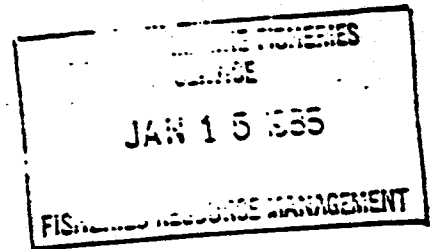
January 10, 1985

JAN 15 1985
F/SWR31:JSM

INTERIM
National Marine Fisheries Service

TO: Carmen J. Blondin
Deputy Assistant Administrator for
Fisheries Resource Management, F/M

FROM: *[Signature]* C. Fullerton
Regional Director, F/SWR



SUBJECT: Allocations of Seamount Groundfish

From the recent information available through publications on seamount groundfish resources, the reports of U.S. observers placed aboard foreign trawlers in the fishery conservation zone (FCZ), and the recommendations (Attachment 1) of the Southwest Fishery Center, Honolulu Laboratory, I recommend that the total allowable level of foreign fishing (TALFF) for seamount groundfish be held in reserve indefinitely until a determination can be made on the ability of the resource to recover from excessive fishing pressure.

The available evidence indicates that seamount groundfish resources on seamounts throughout the western Pacific are depressed and that the resources in the Hancock Seamount area within the FCZ are severely depressed. The catch per unit of effort of seamount groundfish at Hancock has declined from a high of 12.51 mt./hr. in 1978 to 0.79 mt./hr. in 1984 (Attachment 2). A 2,000 mt. TALFF has been available since implementation of the Preliminary Management Plan (PMP) in 1977. Although only 1,000 mt. has been allocated each year, the quota has never been attained; only 72 mt. was taken in 1984.

The PMP states that, due to the almost complete absence of information on seamount resources, the fishery is regarded as experimental and that the goal of the plan is to obtain a better estimate of maximum sustainable yield (MSY). The information accumulated since 1977 permits a better estimate of MSY; however, the implementation of a moratorium by holding the TALFF in reserve is the best approach for two reasons:

1. The Western Pacific Council's bottomfish fishery management plan (FMP) is expected to be implemented in 1985. The FMP will include seamount groundfish, will present a management approach different from that of the PMP, and will contain a framework procedure for determining optimum yield (OY). At its December meeting, the Council agreed that the moratorium is appropriate.

2. The Honolulu Laboratory is planning to initiate a research effort on seamount resources. The closure of Hancock Seamount will provide an opportunity to compare growth between seamounts with and without a fishery. The research effort will lead to better estimates of MSY than can be provided at this time.



Domestic fishing for seamount groundfish has not occurred and is not expected in the near future; therefore, placing the OY in reserve will completely protect the remaining resource. A draft announcement for the Federal Register is attached.

Attachments

cc:

F/SWR1, D. Gates

F/SWR1, R. Shomura

F/SWC, I. Barrett

FEB 22

FEB 13 1985

F/M32:SPF

Mr. Edward Wolfe
Deputy Assistant Secretary
for Oceans and Fisheries Affairs
Department of State
Washington, D.C. 20520

SEND XEROX
TO GARY
and Kathy

Dear Ed,

The National Marine Fisheries Service requests that no allocations of Hancock Seamount Resources be made until a determination can be made on the ability of the resource to recover. The enclosures review the current status of the resources and conclude that the resources in the Hancock Seamount area within the U.S. Exclusive Economic Zone are severely depressed.

A 2,000 metric ton (mt) optimum yield, which consists entirely of the total allowable level of foreign fishing (TALFF), has been available since 1977. Although only 1,000 mt has been allocated each year, the quota has never been attained; only 72 mt was taken in 1984.

The Western Pacific Fishery Management Council's (Council) bottomfish Fishery Management Plan is expected to be implemented in 1985 and will include the current Preliminary Management Plan. At its December meeting, the Council agreed that the moratorium is appropriate. Domestic fishing for seamount groundfish has not occurred and is not expected in the near future; therefore, placing OY in reserve will completely protect the resource.

We request that you inform the Japanese Government and other appropriate foreign governments of our decision to hold the 1985 2000 mt TALFF in reserve.

Sincerely yours,



William G. Gordon
Assistant Administrator
for Fisheries

Enclosures

cc: F(2), F/M, F/M1-Finch, Leedy, F/M11-Jensen, F/M3-Beasley, F/M32-Fox,
Freese, Shutler, Terpak-Malm, Dike, F/M4-Roe, GCF-Luipold, Johnson,
F/SWR, F/SWC

F/M32:SPFFreese:634-7263:jd:1/31/85

F/SWR

DEPT. OF COMMERCE - NOAA
RECEIVED

FEB 15 1985

SOUTHWEST REGION
NATL MARINE FISHERIES SVC.

3510-22

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 611

Foreign Fishing

AGENCY: National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; final specifications for seamount groundfish for 1985.

SUMMARY: 50 CFR 611.20(b) requires that each specification of optimum yield (OY) be reviewed during each fishing season and adjustments to the total allowable level of foreign fishing (TALFF) be made based on updated information related to status of stocks, estimated and actual performance of domestic and foreign fleets, and other relevant factors. A review of the seamount groundfish fishery has been completed and the 2,000 mt. TALFF is being held in reserve for 1985 due to a severe decline in the resource.

EFFECTIVE DATE: (Date of publication)

FOR FURTHER INFORMATION CONTACT: Donna D. Turgeon (Regulations Coordinator).

(202) 634-7432.

SUPPLEMENTARY INFORMATION: The initial estimates of U.S. harvest and TALFF for seamount groundfish were published in the FEDERAL REGISTER on January (), 1985, () as required by 50 CFR 611.20(c). The initial estimate of OY and TALFE was 2,000 mt. which it has been since implementation in 1977 of the Preliminary Management Plan for the Seamount Groundfish Fishery of the Pacific.

A review of the status of seamount groundfish resources in and beyond the Fishery Conservation Zone was concluded after the close of the 1984 fishing season. This has led to the decision to hold the 2,000 mt. OY in reserve while a research effort is conducted to determine the condition of the seamount resources in the Hancock Seamount area and the ability of the resource to recover from apparent excessive fishing pressure. This decision has resulted from the inability of foreign vessels to harvest the TALFF and a continuous decline in catch per unit of effort.

APPENDIX I

LETTERS OF CONSISTENCY



AMERICAN SAMOA GOVERNMENT
PAGO PAGO, AMERICAN SAMOA 96799
OFFICE OF ECONOMIC DEVELOPMENT PLANNING

in reply refer to

ECD

Serial: 016

December 5, 1985

Kitty Simonds, Executive Director
Western Pacific Fishery Management
Council
1164 Bishop Street
Honolulu, Hawaii 96813

Dear Kitty:

The Office of Economic and Development Planning on October 29, 1985 a copy of the revised draft Fishery Management Plan for the bottomfish and seamount fisheries of the Western Pacific for consistency certification with the American Samoa Coastal Zone Management Program. This plan proposes to prohibit the use of bottom trawl and bottom gillnets, as well as the use of explosives, poison, and other toxic substances by both foreign and domestic fishing in the FCZ around American Samoa.

These restrictions would be highly beneficial to local fisheries interest in that the plan provides for protection of endangered sea turtles, prevention of bottom habitat destruction and prevention of indiscriminate fishing activities. In addition, the proposed Administrative framework provides flexibility for future adjustment if found justifiable.

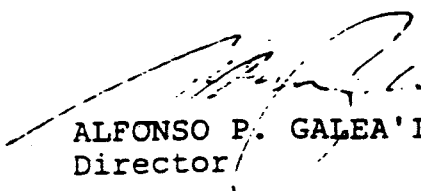
In conclusion, this revised draft Management Plan is found to be consistent with American Samoa Coastal Zone Management Program (ASCZMP) policies, and therefore meets federal consistency as required by the Coastal Zone Management Act of 1972.

Kitty Simonds, Executive Director
Western Pacific Fishery Management Council
Fishery Management Plan for bottomfish

Page: two

Thank you for the opportunity to comment.

Yours sincerely,



ALFONSO P. GALEA'I
Director

cc: Ray Tulafono, Director, Marine Resources
Henry Seseapasara, ASCZMP Manager, DPO

APG:rpl



BUREAU OF PLANNING
GOVERNMENT OF GUAM
AGANA, GUAM 96910

NOV 10 1985

Ms. Kitty Simonds
Executive Director
Western Pacific Regional
Fishery Management Council
1164 Bishop Street, Room 1405
Honolulu, Hawaii 96813

Dear Ms. Simonds:

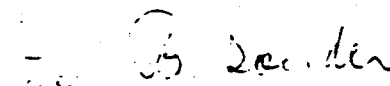
The Bureau of Planning received on October 24, 1985 a copy of the revised draft Fishery Management Plan for the Bottomfish and Seamount Ground Fisheries of the Western Pacific for consistency certification with the Guam Coastal Management Program (GCMP). This plan proposes to prohibit the use of bottom trawl and bottom gill nets, as well as the use of explosives, poison, and other toxic substances by both foreign and domestic fishing in the FCZ around Guam.

These restrictions would be highly beneficial to local fisheries interest in that the plan provides for protection of endangered sea turtles, prevention of bottom habitat destruction, and prevention of indiscriminate fishing activities. In addition, the proposed administrative framework provides flexibility for future adjustment if found justifiable.

In conclusion, this revised draft management plan is found to be consistent with GCMP policies, and therefore meets federal consistency as required by the Coastal Zone Management Act of 1972.

Thank you for the opportunity to comment.

Sincerely,


PAUL B. SOUDER
Director



DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

KAMAMALU BUILDING, 250 SOUTH KING ST, HONOLULU, HAWAII
MAILING ADDRESS: P.O. BOX 2359, HONOLULU, HAWAII 96804 • TELEX: 7430250 HDPED

APPENDIX I
GEORGE R. ARYOSHI
GOVERNOR
KENT M. KEITH
DIRECTOR
MURRAY E. TOWILL
DEPUTY DIRECTOR
LINDA KAPUNIAI ROSEHILL
DEPUTY DIRECTOR

DIVISIONS
BUSINESS AND INDUSTRY DEVELOPMENT DIVISION
ENERGY DIVISION
335 MARCHANT ST. ROOM 110 HONOLULU, HAWAII 96813
FOREIGN-TRADE ZONE DIVISION
PLANNING DIVISION
RESEARCH AND ECONOMIC ANALYSIS DIVISION
OFFICES
ADMINISTRATIVE SERVICES OFFICE
INFORMATION OFFICE

Ref. No. P-3469

February 4, 1986

Ms. Kitty Simonds
Executive Director
Western Pacific Fishery
Management Council
1164 Bishop Street, Room 1405
Honolulu, Hawaii 96813

Dear Ms. Simonds:

Subject: Revised Draft Fishery Management Plan for the Bottomfish
and Seamount Groundfish Fisheries of the Western Pacific
Region (FC/85-072)

We have reviewed the revised plan and agree with the Council's
determination that it is consistent to the maximum extent practicable with
Hawaii's Coastal Zone Management (CZM) Program. Your continued cooperation in
assuring compliance with the CZM consistency review process is greatly
appreciated.

Very truly yours,

Murray E. Towill
Kent M. Keith

cc: Mr. Doyle Gates, Director
Western Program Office
National Marine Fisheries Service

APPENDIX J

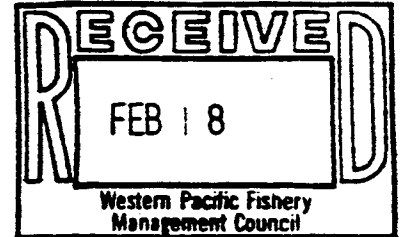
NATIONAL MARINE FISHERIES SERVICE BIOLOGICAL OPINION
(Section 7(b) Endangered Species Act)



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235

F/SWR1:LDC
F/M412:PM

February 10, 1986



Ms. Kitty Simonds
Executive Director
Western Pacific Regional
Fishery Management Council
1164 Bishop St., Suite 1405
Honolulu, Hawaii 96813

Dear Ms. Simonds:

Enclosed is the Biological Opinion prepared by the National Marine Fisheries Service (NMFS) pursuant to Section 7(b) of the Endangered Species Act (ESA), as amended, concerning the potential impacts to threatened and endangered species associated with implementation of the Western Pacific Regional Fishery Management Council's Draft Fishery Management Plan for the Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region (September 1985).

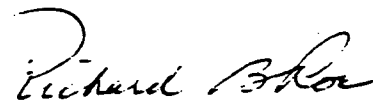
Based on the available information, we conclude that the proposed action is not likely to jeopardize any threatened or endangered species within the FMP's geographic scope. Conservation recommendations are made to provide NMFS with documentation of incidental take of marine mammals and sea turtles and fisheries interactions, as well as to inform Northwestern Hawaiian Islands (NWHI) bottomfish fisheries about the potential for interactions with Hawaiian monk seals.

Consultation must be reinitiated if: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species that was not considered in the biological opinion; or (4) a new species is listed or critical habitat is designated that may be affected



by the identified action. Critical habitat designation for the Hawaiian monk seal is currently under consideration by NMFS. As the FMP proposes no habitat modifications to the NWHI, reinitiation of consultation will not be required upon actual designation.

Sincerely,


William G. Gordon
for Assistant Administrator
for Fisheries

Enclosure

Endangered Species Act
Section 7 Consultation
Biological Opinion

Agency: Western Pacific Regional Fishery Management Council

Activities Considered During Consultation: Implementation of a Fishery Management Plan for the Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region.

Consultation Conducted by: National Marine Fisheries Service (NMFS), Southwest Region

Date of Issuance: FEB 10 1986

Background:

By letter dated April 2, 1985, the Western Pacific Regional Fishery Management Council (WPRFMC) requested formal consultation under Section 7 of the Endangered Species Act of 1973, as amended, for possible impacts on threatened and endangered species of its draft Fishery Management Plan (FMP) for the Bottomfish and Seamount Groundfish Fisheries of the Western Pacific Region.

By letter dated July 2, 1985, the NMFS requested suspension of consultation in light of the WPRFMC's planned revision of the FMP. On October 2, 1985 the WPRFMC transmitted a revised draft FMP and requested resumption of consultation. By letter dated October 7, 1985 the NMFS acknowledged receipt of the revised FMP and reinitiated consultation.

Proposed Activities

The Western Pacific Regional Fishery Management Council proposes a package of management measures for the bottomfish and seamount groundfish fisheries in the FCZ around Hawaii, American Samoa, and Guam, as follows:

Administrative framework for future regulations -- The plan proposes a "framework" for managing the bottomfish fishery in the FCZ around Hawaii, American Samoa, and Guam. This framework is largely an administrative procedure which describes the processes by which the fishery will be managed and which establishes the limits and controls within which regulatory adjustments may be

made. A set of heavily-fished species would be routinely monitored and a set of indicators would provide the basis for further investigation. Investigation could result in recommendations to make adjustments in the management system in response to new information. The types of adjustments that could occur include the following:

- o Catch Limits (individual or total harvest)
- o Size limits
- o Area/Season Closures
- o Fishing Effort Limitation
- o Fishing Gear Restrictions
- o Access Limitation
- o Permit and/or Catch Reporting Requirements for the FCZ

Gear restrictions -- Prohibit the use of bottom trawl and bottom-set gillnets to harvest bottomfish in the FCZ.

-- Establish a 6-year moratorium on trawl fishing in the FCZ portion of the seamount groundfish fishery to promote the recovery of depleted stocks.

-- Prohibit the use of explosives and poisons for harvesting bottomfish in the FCZ off Hawaii, Guam, and American Samoa. In the FCZ off Hawaii and Guam, this would be consistent with existing State/Territory rules.

Minimum size limit -- Prohibit the sale of onaga, opakapaka, uku, and papio (ulua) of less than one pound taken in the Hawaii FCZ. This would be consistent with existing State law.

Northwestern Hawaiian Islands (NWHI) permit -- Require a Federal permit for bottomfishing in the FCZ of the NWHI.

Experimental Fishing permit -- To improve the data base, the Regional Director of NMFS will be authorized to issue a limited number of domestic experimental fishing permits allowing fishing which might otherwise be prohibited by regulations promulgated through the framework process.

Annual review -- A monitoring team appointed by the Council and representing scientists, fishery managers, and fishing interests will prepare an annual review of fishery performance with special emphasis on further investigation of any key indicators which raise concerns.

Data collection procedures -- To obtain the catch/effort data for the annual review, reliance would be placed on existing State and Territory data reporting systems, and a Federal reporting requirement would not be added initially. The Council would consider authorizing Federal data reporting requirements in the event State/Territory systems prove inadequate.

LIST OF ENDANGERED OR THREATENED SPECIES THAT MAY OCCUR
IN THE ACTIVITY AREA

Hawaiian monk seal (Monachus schauinslandi) - endangered
Green sea turtle (Chelonia mydas) - threatened
Hawksbill turtle (Eretmochelys imbricata) - endangered
Leatherback turtle (Dermochelys coriacea) - endangered
Olive ridley turtle (Lepidochelys olivacea) - threatened
Humpback whale (Megaptera novaeangliae) - endangered
Sperm whale (Physeter macrocephalus) - endangered
Fin whale (Balaenoptera physalus) - endangered

BIOLOGY AND DISTRIBUTION OF SPECIES

Hawaiian monk seal

The Hawaiian monk seal population was greatly depleted due to sealing and harassment in the nineteenth century. Historical records indicate that monk seals were utilized for oil and pelts during that time. Only the cessation of sealing and the monk seal's isolated habitat in the NWHI allowed the species to survive.

The breeding range of the monk seal is restricted to eight NWHI. They have been observed in waters around the main Hawaiian Islands and as far away as Johnston Atoll (420 nmi SW of French Frigate Shoals). There is no evidence to indicate that the range has historically been significantly different from this, although Kenyon (1972) postulated that prior to the arrival of the Polynesians, monk seals bred on favorable beaches of the main Hawaiian Islands. Gerrodette (1985) presented a preliminary estimate for the total population of Hawaiian monk seals of 1,488 animals for 1983. Half the total population was at French Frigate Shoals, and over half of the births occurred there.

Humpback whale

The North Pacific humpback whale is the second most depleted endangered cetacean in the Pacific (Braham, 1984). The entire population is estimated at less than 1,200 animals (Johnson and Wolman, 1984). An estimated 550-790 North Pacific humpback whales spend winter and early spring months (December-May) in the nearshore waters of the main Hawaiian Islands (Rice and Wolman, 1979). An unknown number of North Pacific humpback whales were reported in the Northern Mariana Islands by Nishiwaki (1959). No current information on local population size or distribution in that area is available.

A small, unknown segment of the South Pacific population of humpback whales visits the nearshore waters of American Samoa during the austral winter (Kaufman, 1983). These whales are thought to be reproductively isolated from those visiting Hawaii and the Marianas.

Fin and Sperm Whale

Fin whale and sperm whale sightings are rare in the Hawaiian Islands (Shallenberger, 1981). The normal range of fin whales is north of the activity area, whereas sperm whales occur throughout the tropical Pacific (Leatherwood and Reeves, 1983) with recent sightings or strandings from Hawaii and American Samoa. The North Pacific fin whale population is reported at 14,620 - 18,630. The western North Pacific sperm whale population is reported at 198,000 whales (Braham, 1984).

Sea Turtles

Four species of sea turtles are known to occur within the activity area: green, hawksbill, olive ridley, and leatherback.

Green turtles are found throughout the Hawaiian archipelago, though 90% of all nesting occurs at French Frigate Shoals. The number of females nesting there fluctuates annually, the mean being estimated as high as 300 from 1973 - 1982 (Balazs, 1980; Wetherall, 1983). The total mature female population at French Frigate Shoals is estimated at 750 animals.

The Hawaiian hawksbill turtle population is small and limited to the eight main islands. Nesting has been documented on the Big Island (Hawaii) and Molokai (Balazs, 1981). Sightings of leatherback turtles are common in offshore waters of the main islands, while the olive ridley is a rare visitor to Hawaii. Both green and hawksbill turtles nest and feed at American Samoa (Tutuila, Swains, and Rose Atoll) and Guam (Balazs, 1981; Pritchard, 1981), but no population estimates are available.

Potential Impacts on Species

Neither the fin whale nor the sperm whale has any history of interactions with any fishery in the central or western Pacific. In the North Pacific, there is one account of a sperm whale systematically robbing bottomfish from a foreign longliner (Personal communication - Joanna Flanders, National Marine Mammal Laboratory, Seattle, WA.) - but this is undoubtedly a very rare behavior. While humpback whales are regularly entangled in

nearshore gillnets in the northwest Atlantic, there are no records of entanglement or any other fishery interactions in the activity area.

Incidental capture by longliners of green, leatherback, and olive ridley turtles is documented from the central and western Pacific (Balazs, 1982), and fishing related debris (monofilament net and line) entanglement of green, hawksbill, and olive ridley turtles is documented from the central Pacific (Balazs, 1984). There is no documentation, however, of sea turtle incidental take by bottomfish hook-and-line gear. The prohibition of bottomfishing with net gear is likely to reduce the probability of turtle incidental take, as well as reduce the potential amount of net fragments that may entangle turtles.

The potential for monk seal entanglement in fishing gear exists and has been reported by Henderson (1984) in the NWHI. A large percentage of the incidents of seal entanglement observed since 1974 have involved weaned pups, who are more likely to explore objects in their environment than older animals. One of the objectives of the Hawaiian Monk Seal Recovery Plan (U.S. Dept. of Commerce, 1984) is to document, and where possible, mitigate the direct and indirect effects of human activities on monk seals. The FMP's provisions are consistent with this goal. Under the FMP, the use of net gear would be prohibited, thus reducing the risk of entanglement of monk seals (and other species) in the FCZ of the NWHI both during active fishing and (possibly) from discarded or lost gear.

The FMP notes that the NWHI bottomfishing fleet has grown from 5 to 20 vessels in two years, and that continued expansion is likely. Attendant with the growth in the fleet, there is an increasing potential for Hawaiian monk seal interaction with the bottomfish fishery in the NWHI. Fishermen have reported seals taking catch from the hooks or damaging fish as lines are being pulled in (William Gilmartin, personal communication). In California and the Pacific Northwest (including Alaska) seals and sea lions interact similarly with several fisheries. These interactions have resulted in general animosity towards pinnipeds and shootings. Likewise, fishermen in the main Hawaiian Islands have attempted to resolve dolphin/fishery interactions by shooting and poisoning the dolphins (Kuljis, 1983). Because the monk seal population is small and the number of fishing vessels is small, the rate of monk seal fisheries interactions is not anticipated to reach a level analogous to the west coast or the main Hawaiian Islands. In addition, the NMFS will conduct an education program to inform fishermen of the protected status of monk seals and the prohibition of the ESA. This education program combined with the anticipated low rate of interaction should preclude this type of problem from evolving. If taking of

monk seals is documented as the result of fishermen attempting to protect their catch, the NMFS will enforce the prohibitions of the ESA and will also reinitiate consultation.

Both monk seals and green turtles may be affected by bottomfish vessel groundings in the NWHI. Potential impacts include direct effects of spilled fuel, and introduction of rats and other exotic species.

Conclusions

Our evaluation of the available information indicates that the management proposals of the FMP would not jeopardize the continued existence of any of the listed species in the activity area.

Reinitiation of Consultation

Reinitiation of formal consultation is required if (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the identified action. Critical habitat for the Hawaiian monk seal is presently under consideration by NMFS. Implementation of critical habitat for this species will not require reinitiation of consultation as there are no proposals in the FMP calling for the modification of the proposed critical habitat.

CONSERVATION RECOMMENDATIONS

1) The FMP notes that reports of incidental taking of a threatened or endangered species by any person engaged in bottomfishing should trigger an investigation by the NMFS. Yet no provisions are provided to require such reports. The Council should require under the FMP the reporting of all interactions with marine mammals and sea turtles. "Interactions" includes incidental capture as well as damage to gear or hooked fish by monk seals, turtles, or dolphins. Minimum information required for incidental captures must include the following: species and description; location; date; circumstances; condition released. Permits should clearly state that every effort must be made to

return turtles and marine mammals to the sea alive, with as little harm as possible.

2) The Council should also cooperate with the NMFS in developing an information and education program to ensure that bottomfish fishermen in the NWHI are aware of the latest regulations and information necessary to protect endangered and threatened species. Fishermen must be made aware that some amount of gear and catch damage by monk seals may be inevitable in the NWHI, and that intentional harm of seals may result in restrictions of the fishery and possible prosecution.

The NMFS, Western Pacific Program Office staff is available to work with the Council to carry out these recommendations.

Statement Regarding Incidental Taking Pursuant to
Section 7 (b) of
the Endangered Species Act of 1973, as Amended

Section 7(b)(4) of the Endangered Species Act requires that when a proposed agency action is found to be consistent with Section 7(a)(2) of the Act and the proposed action is likely to take individuals of some species incidental to the action, the NMFS will issue a statement that specifies the impact (amount or extent) of such incidental taking, and will provide reasonable and prudent measures that are necessary to minimize such impacts. Terms and conditions that must be complied with are set forth to implement those measures.

By definition, a species or population stock which is listed as threatened or endangered under the ESA is also considered depleted under the Marine Mammal Protection Act of 1972 (MMPA). Under Section 101(a)(3)(B) of the MMPA, taking of depleted species can be permitted only for scientific purposes. Since the taking of Hawaiian monk seals and whales is thus prohibited, no Section 7(b)(4) statement for these species will be provided.

The available information indicates that incidental taking of listed sea turtles occurs in pelagic longline fisheries, not bottomfish longlines in the Central and Western Pacific. We expect take by allowable gear under the FMP to be negligible, if any, and therefore set the acceptable levels of incidental take at 5 individuals each of hawksbill, leatherback, and olive ridley sea turtles and 15 of green sea turtles. Of these, mortality may not exceed 2 animals of each species. The terms and conditions that must be complied with are (1) the date of take and accounts of mortality must be provided to the NMFS as described in the preceding Biological Opinion, and (2) every effort must be made to return the turtles to the sea alive, with as little harm as possible. The reports and other available information will be evaluated annually by NMFS to determine whether or not the incidental take level should be modified or if other management measures need to be instituted.

Should the level of total take or mortality be exceeded for any species within any year, then consultation must be re-initiated at that time.

REFERENCES

- Balazs, G.H. 1984. Impact of ocean debris on marine entanglement and ingestion. Report submitted for A on the Fate and Impact of Marine Debris as FIMD/84/WP-46pp.
- .1981. Status of sea turtles in the central Pacific Ocean. In K.A. Bjorndal (ed.) Biology and Conservation of Sea Turtles. Smithsonian Institution Press, Washington, D.C. Pg. 243-252.
- .1980. Synopsis of biological data on the green turtle in the Hawaiian islands. NOAA, NMFS, Southwest Fisheries Center, Honolulu Laboratory. Technical Memorandum NOAA-TM-NMFS, SWFC-7. 141 pp.
- Braham, H.W. 1984. The status of endangered whales, an overview. Mar. Fish. Rev. 46(4):2-6.
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