



**WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL**

**Amendment 1
and Environmental Assessment**

>

**Fishery Management Plan for the Pelagic
Fisheries of the Western Pacific Region**

November 21, 1990

**Western Pacific Regional Fishery Management Council
1164 Bishop Street, #1405
Honolulu, Hawaii 96813
Telephone: (808) 523-1368
FAX: (808) 526-0824**

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1.0 PREFACE

1.1 Responsible Agencies

The Western Pacific Regional Fishery Management Council (WPRFMC or Council) was established by the Magnuson Fishery Conservation and Management Act of 1976 (MFCMA) to develop Fishery Management Plans (FMPs) for fisheries in the U.S. Exclusive Economic Zone (EEZ) around American Samoa, Hawaii (including the Northwestern Hawaiian Islands), Guam, the Northern Marianas Islands, and other United States possessions in the Pacific¹. Once an FMP is approved by the Secretary of Commerce, it is implemented by federal regulations which, in turn, are enforced by the National Marine Fisheries Service (NMFS) and the U.S. Coast Guard, along with state and territorial agencies.

For further information, contact:

Ms. Kitty Simonds
Executive Director
WPRFMC
1164 Bishop St., #1405
Honolulu, HI 96813
Telephone: (808) 523-1368
Fax: (808) 526-0824

Mr. Alvin Katekaru
Resource Management Specialist
NMFS Pacific Area Office
2570 Dole St.
Honolulu, HI 96822
Telephone: (808) 955-8831
Fax: (808) 949-7400

1.2 Public Review and Comment

The Council involves fishermen and other interested parties in developing FMPs and amendments to ensure that those affected will have an opportunity to give the Council their views about any proposed action.

The action proposed by this amendment was developed by the Pelagic Plan Monitoring Team and was reviewed by the Scientific and Statistical Committee, the Council's Pelagic Standing Committee, and the full Council in September 1990. A draft of this amendment was available to fishermen and other interested parties who attended the Council's meeting and meetings of associated committees. Comments received have been incorporated into the draft amendment which will be submitted to the Secretary of Commerce and released for public review.

1.3 Relationship to Applicable Laws and Policies

This first amendment to the FMP for the pelagic fisheries complies with the Secretary of Commerce's revised guidelines for the national standards of the MFCMA. Information and analysis in support of the proposed action are presented in a manner intended to satisfy MFCMA requirements, as well as the requirements of other applicable laws and policies. The FMP for the pelagic fisheries satisfied the information and procedural requirements of the National Environmental Policy Act, the Regulatory Flexibility Act, Executive

¹Howland and Baker Islands, Jarvis Island, Johnston Atoll, Kingman Reef and Palmyra Island, and Wake Island.

Order 12291, and other laws and directives. The FMP also served as an Environmental Impact Statement (EIS). Similarly, this amendment is intended to serve as an Environmental Assessment. The amendment assesses the economic and administrative/enforcement impacts of the proposed action, and contains all the information necessary under the several statutes and directives applicable to the planning process. A copy of the original FMP, companion regulations, and annual reports on the pelagic fisheries may be obtained from the Council.

1.4 List of Preparers

Amendment 1 was prepared by the Council's Pelagic Plan Monitoring Team:

Dr. Robert A. Skillman (CHR)
NMFS Honolulu Laboratory

Dr. Christofer H. Boggs
NMFS Honolulu Laboratory

Dr. Richard Brock
University of Hawaii Sea Grant Program

Dr. Terry Donaldson
Northern Mariana Islands Division of Fish and Wildlife

Dr. David Grobecker
Pacific Ocean Research Foundation, Kona, Hawaii

Mr. David C. Hamm
NMFS Honolulu Laboratory

Mr. Walter Ikehara
State of Hawaii Division of Aquatic Resources

Mr. Gordon Leslie
Captain Cook, Hawaii

Mr. Robert F. Myers
Guam Division of Aquatic and Wildlife Resources

Ms. Bonnie Ponwith
American Samoa Department of Marine and Wildlife Resources

Dr. Samuel G. Pooley
NMFS Honolulu Laboratory

Dr. Jerry A. Wetherall
NMFS Honolulu Laboratory

and:

Mr. Justin Rutka, Staff
Western Pacific Regional Fishery Management Council

Mr. Svein Fougner
NMFS Southwest Region, Terminal Island, California

Mr. Alvin Katekaru
NMFS Southwest Region, Pacific Area Office, Honolulu

2.0 BACKGROUND

The FMP for the Pelagic Fisheries of the Western Pacific Region was implemented on March 23, 1987. The FMP covers the vast geographic region (approximately 1.5 million square nautical miles) encompassing the U.S. EEZ around American Samoa, Guam, Hawaii, and other United States possessions in the Pacific.

2.1 Species and Habitat

The pelagic fish resources of the western Pacific region can be divided into three broad classes: oceanic sharks, tunas, and billfish and associated species. At present, the PMUS most important to domestic fishermen in the council's region in descending order of importance are: billfishes, mahimahi, wahoo, and sharks. The domestic fisheries for oceanic sharks are just beginning to develop in the American flag islands in the Pacific.

The pelagic management unit species (PMUS) presently covered by the FMP include:

Common Name	Scientific Name
Mahimahi (dolphinfish)	<u>Coryphaena hippurus</u>
Pompano dolphinfish	<u>C. equiselis</u>
Wahoo	<u>Acanthocybium solandri</u>
Indo-Pacific blue marlin	<u>Makaira mazara</u>
Black marlin	<u>M. indica</u>
Striped marlin	<u>Tetrapturus audax</u>
Shortbill spearfish	<u>T. angustirostris</u>
Swordfish	<u>Xiphias gladius</u>
Requiem sharks	Carcharhinidae
Thresher sharks	Alopiidae
Hammerhead sharks	Sphyrnidae
Mackerel sharks	Lamnidae

Most PMUS are considered to be epipelagic because they occupy the uppermost layers of the pelagic zone. All are high predators in the trophic sense. They are caught in oceanic and insular waters.

Oceanic and offshore insular waters are still nearly pristine and there is no information to suggest that the habitat of the PMUS has been subjected to alterations or modifications in the recent past. However, the habitat of pelagic fishes is subject to continued introduction of low level pollution from both point and non-point sources. Ocean pollution is an ongoing problem with unknown impacts on the PMUS, particularly at the egg and larval stages. Sources of pollution include run-off from high islands, sewage from deep ocean outfalls, and ships at sea, oil from bilges and accidental spills, solid and liquid wastes dumped at sea, and debris flowing in from rivers and drifting into the ocean or debris directly introduced into the habitat by vessels. The mining of manganese crust deposits on seamounts within the EEZ and the incineration of deadly chemical weapons at Johnston Island may possibly impact the habitat of pelagic fishes. On balance, however, habitat conditions of

pelagic fishes in the Council's are expected to remain favorable well into the future.

2.2 Description of Fisheries

The fisheries for PMUS are generally very important components of most Pacific island fisheries, including the fisheries of the American Pacific islands. Commercial, recreational, and subsistence fisheries for pelagic fishes occur in American Samoa, Guam, and Hawaii, and other U.S. island possessions in the Pacific.

2.2.1 Hawaii

In 1989, commercial fishermen in Hawaii landed an estimated 13.2 million pounds of pelagic fish, including tuna. Longliners produced 75 percent of commercial landings of pelagic fishes in 1989, while commercial trollers and handliners accounted for the remainder of commercial landings. PMUS made up 40 percent (mostly billfishes) of longliner landings in 1989 while tuna accounted for the rest. On the other hand, commercial trollers and handliners caught more billfish, mahimahi, and wahoo in 1989 than tuna.

In 1989, the longline fishery generated more money in fish sales than all of Hawaii's other commercial fisheries combined. There are now around 150 domestic longline vessels operating in Hawaii, and more longliners are expected to arrive soon, mostly from declining fisheries for swordfish in the Atlantic and for yellowfin tuna in the Gulf of Mexico.

There are thousands of vessels engaged in the recreational and subsistence fisheries for pelagic species in Hawaii. The volume of recreational and subsistence catches is unknown at present, but it is believed to be very substantial, perhaps even surpassing commercial catches. A sample design is now being field tested in Hawaii which, if successful, will be used to derive estimates of recreational and subsistence catches in Hawaii.

2.2.2 American Samoa

In 1989, American Samoa fishermen landed about 200,000 pounds of pelagic fish, virtually all of which were troll caught. (In comparison, the Hawaii commercial fishery landed 13.2 million pounds of pelagic fish.) Tuna made up 88 percent of the landings of American Samoa fishermen in 1989, while blue marlin, sharks, mahimahi, and wahoo made up most of the remainder.

What American Samoa (pop. 33,000) lacks in size with regard to its local troll fishery for pelagic fish, it makes it up in a very big way with regard to the distant-water purse seine and longline fisheries which base their operations in American Samoa. In 1989, American purse seiners delivered 130,000 short tons of yellowfin and skipjack tuna for processing at the two canneries in American Samoa. Another 55,000 short

tons of skipjack and yellowfin tuna caught by foreign purse seiners were transshipped into American Samoa for processing last year.

American Samoa also serves as a major center for foreign longline fisheries targeted at albacore tuna. Around 100 Taiwanese and 40 Korean longline vessels offloaded about 30,000 short tons of albacore tuna for processing in American Samoa canneries in 1989. In addition, about 30 American troll vessels landed around 5,000 short tons of albacore tuna in American Samoa last year.

2.2.3 Guam

Close to 200 local small vessels are engaged in trolling for pelagic fish in Guam. These vessels caught an estimated 500,000 pounds of pelagic fish in 1989. There are also 22 purse seine vessels (American and Korean) based in Guam. Prior to 1981, the Port of Guam served as the major transshipment base for tuna caught by purse seiners in the western Pacific. Now, most of the purse seiner tuna transshipment activity has shifted to the island of Tinian in the Commonwealth of the Northern Mariana Islands.

Presently, there are some 30 foreign longliners based in Guam which land their catches of tuna and billfish there for air transshipment to Japanese sashimi markets. The major fishing grounds for the foreign longline vessels operating out of Guam is in Micronesian waters, especially the EEZ of the Federated States of Micronesia (FSM). The southern border of Guam's EEZ abuts the EEZ of FSM, which is only about 100 miles south of the island of Guam.

2.2.4 Possessions

Baker, Howland, and Jarvis islands and Kingman Reef are owned by the U.S. Government. They are uninhabited and serve as refuges for seabirds. Palmyra Island is privately owned, and it is also uninhabited most of the time. Wake Island and Johnston Atoll are administered by the Defense Department, and Defense Department personnel fish recreationally.

Japanese pole-and-line vessels (baitboats) also fish extensively in the EEZ of U.S. possessions in the Pacific. At present, there is no authorized foreign longline fishing anywhere in the U.S. EEZ of the Western Pacific Region. The extent of purse seine fishing in the EEZ of U.S. possessions is unknown at present.

2.3 Condition of Stocks

The most recent and best available information on the status of Pacific billfish stocks is in the Proceedings of the Second International Billfish Symposium held in Kailua-Kona, August 1-5, 1988 (Stroud, ed. 1989). At the Symposium, U.S. and Japanese scientists, working independently but with similar data, reached the following conclusion regarding the status of Pacific billfish stocks.

The Pacific-wide stock of blue marlin is moderately growth overfished, but less so as compared with a stock assessment made 10 years ago. The status of black marlin on a Pacific-wide basis could not be determined because of mis-reporting, under-reporting, or other data quality problems. The striped marlin stocks (assessed using a single Pacific-wide stock or separate North and South Pacific stocks) are probably underfished, but the North Pacific assessment is suspect due to the lack of data on the large-mesh drift gillnet fishery. The Pacific-wide swordfish stock may be about at the point of MSY, but most scientists declined to draw conclusions because the stock is probably not in equilibrium due to major changes occurring in the fishery. The sailfish and shortbill spearfish species complex is probably underfished, or at the MSY level, but again data problems have made stock assessments difficult.

No information is available on the status of wahoo, oceanic sharks, and the two species of mahimahi. There are no indications that these species are overfished on a Pacific-wide or a localized basis. However, the existence of established, fairly large scale fisheries for the common mahimahi off Japan and Taiwan in the western Pacific and Ecuador in the eastern Pacific, as well as numerous small scale fisheries for mahimahi throughout the Pacific Basin suggests that the resource is certainly not in a virgin state. Also, incidental catches of mahimahi occur in the well developed tuna purse seine fishery in the central and western Pacific as well as in the controversial large-mesh drift gillnet fisheries in the North and South Pacific.

3.0 EXISTING MANAGEMENT MEASURES

FMP management measures govern fishing activities of U.S. vessels (50 CFR 685 Subpart B) and foreign vessels (50 CFR 611 Subpart F) operating in the EEZ surrounding American Samoa, Guam, Hawaii, and the U.S. Pacific Island possessions. Management measures regulating foreign fishing vessels include: area closures, gear restrictions (i.e., drift gillnets), fishing permits, reporting and observer requirements, submission of effort plans, and catch and effort limits. U.S. fishing vessels also are prohibited from using drift-gillnets except with an experimental fishing permit approved by the Secretary of Commerce. Domestic vessels that harvest pelagic management unit species are required to comply with the catch reporting requirements of the state and territories. The FMP also calls for the preparation of an annual report on the status of the domestic and foreign fisheries and a full review on the effectiveness of the FMP prior to March 23, 1992.

On June 20, 1990, the Council voted to request the Secretary of Commerce to implement emergency measures governing the domestic longline fishery in the Western Pacific region. The measures, which will become effective on November 27, 1990, will require federal permits for all U.S. fishing vessels using longline gear in the EEZ, vessels transshipping within the EEZ fish taken by longline gear, and vessels landing longline caught fish in American Samoa, Guam, and Hawaii. The operators of all permitted longliners will be required to maintain daily catch and effort logbooks which must be submitted to the National Marine Fisheries Service within 72 hours following the landing of fish. Observer requirements will also be imposed on longliners that intend to fish within 50 nautical miles off certain Northwestern Hawaiian Islands inhabited by marine mammals.

4.0 NEED FOR AMENDMENT 1

While the MFCMA defines optimum yield as a derivative of maximum sustainable yield, it does not define overfishing, nor does the FMP. The amendment is needed to make the FMP consistent with the Secretary's revised guidelines (Federal Register: 54 FR 30826 et seq.). The guidelines require that each fishery management plan must have an objective and measurable definition of overfishing, i.e., recruitment overfishing, for each managed stock or stock complex, with an analysis of how the definition was developed and how it relates to spawning stock potential.

5.0 MANAGEMENT OBJECTIVE OF AMENDMENT 1

The management objective of this amendment is to include within the FMP objective and measurable definitions of overfishing (i.e., recruitment overfishing) thereby providing guidance to the Council in its effort to prevent overfishing and achieve Optimum Yield in the fishery.

6.0 PROPOSED ACTIONS AND IMPACTS

6.1 Proposed Actions

The actions of Amendment 1 to the FMP for the Pelagic Fisheries of the Western Pacific Region are to amend the plan to: (a) include a definition of overfishing, (b) revise the definition of Optimum Yield (OY), and (c) revise the objectives of the FMP to bring them in to accord with the definition of overfishing, the revised definition of OY, and the status of fishery development in the Western Pacific region.

6.1.1 Definitions of Recruitment Overfishing

When a management unit species or stock is overfished, overfishing is defined as a harvest rate that is not consistent with a program established to maintain the species or stock above the minimum level of SPR and incapable of achieving Optimum Yield (OY). It is the Council's intent to manage the fisheries at OY, thus preventing the stocks from declining to the point of recruitment overfishing.

6.1.1.1 Billfishes, Mahimahi (Dolphinfishes), Wahoo (Excluding Oceanic Sharks)

Billfishes, mahimahi, and wahoo are considered overfished when their Spawning Potential Ratio (SPR) is equal to or less than 0.20. The SPR is a measure of the current reproductive capacity of these stocks or stock complex relative to their unexploited capacity over their entire range.

6.1.1.2 Oceanic Sharks (Requiem, Thresher, Hammerhead, and Mackerel Sharks)

Oceanic sharks are considered overfished when their Spawning Potential Ratio (SPR) is equal to or less than 0.35. The SPR is a measure of the current reproductive capacity of oceanic shark stocks or stock complexes relative to their unexploited capacity over their entire range.

Recruitment overfishing for the management unit species is defined in terms of Spawning Potential Ratio (SPR) which may be estimated in several alternative ways depending on the quality of available statistics. SPR is a measure of the current reproductive capacity of the stock relative to its unexploited capacity and is inversely proportional to fishing mortality. Thus, SPR ranges from 1.0 before exploitation toward 0.0 with increasing fishing mortality.

6.1.2 Alternative Methods of Measuring the Spawning Potential Ratio (SPR)

SPR may be estimated in several ways using estimates of spawning stock biomass (SSB), spawning stock biomass per recruit (SSBR), spawning stock catch per unit effort (SSCPUE), exploitable stock catch per unit

effort (ESCPUE), and exploitable stock biomass (ESB). The alternatives are presented below in priority order.

a. $SPR = (SSCPUE_{current} / SSCPUE_{unfished})$

This estimation procedure depends on estimates of spawning stock density (CPUE) because estimates of population parameters (growth parameters as well as fishing and natural mortality in particular) are not currently available and are not likely to be available in the near future for most management unit species. CPUE is taken to be a valid index of spawning stock abundance or biomass; however, changes in gear efficiency over the history of the fishery will require careful examination of the data. Somerton and Kobayashi (1990) have pointed out also that this is a dynamic, as opposed to an equilibrium, estimator.

b. $SPR = (SSBR_{current} / SSBR_{unfished})$

This estimation procedure is taken directly from Goodyear (1989) and represents a population parameter based approach that assumes equilibrium. It is the standard approach being followed in many if not most other FMP's. As a practical matter, estimates of SSBR at the start of the fishery will be used for $SSBR_{unfished}$.

c. $SPR = (SSB_{current} / SSB_{unfished})$

This estimation procedure is essentially the same as b above except that recruitment must be estimated as well as growth and mortality. The difficulty of estimating recruitment (and the uncertainty of the estimates) has led to the common practice of using yield per recruit (Y/R) in age based stock assessment rather than estimating yield directly. Thus, procedure b would be preferable to this procedure.

d. $SPR = (ESCPUE_{current} / ESCPUE_{unfished})$

Using this procedure, involving CPUE as an index of exploitable stock biomass rather than CPUE of spawning stock biomass, would be necessary where estimates of population parameters used to estimate the spawning stock biomass are not available. See procedure e below.

e. $SPR = (ESB_{current} / ESB_{unfished})$

Using this procedure, involving exploitable stock biomass rather than spawning stock biomass, may be necessary in those cases where the size or age at maturity is not well defined for a management unit species. It may also be necessary when fishery data are inadequate to allow dividing the catch into mature and immature categories. This is not a desirable procedure because changes in spawning biomass would not be monitored directly and might be masked by increased recruitment of immature fish. However, the procedure may have to be employed on an interim basis until better data are assembled.

Since the best scientific evidence is most supportive of Pacific-wide or North and South Pacific stocks, SPR cannot be estimated reliably with any of the above estimators using statistics from the U.S. EEZ alone. Access to foreign statistics and information will be required, and this would be most easily effected through formation and participation in some regional/international arrangement. In spite of this situation, the Council's Plan Monitoring Team intends to evaluate the utility of using the above estimators of SPR calculated from such data as indicators of the stock condition relative to recruitment overfishing until more reliable estimates are available.

6.1.3 Optimum Yield (OY)

6.1.3.1 Original Definition of OY

OY is defined for each management unit species in non-numeric terms as follows:

OY is that amount of each species in the management unit that will be caught by domestic and foreign vessels fishing in the FCZ (EEZ) in accordance with the measures contained in this plan.

6.1.3.2 Revised Definition of OY

OY is the amount of each management unit species or species complex that can be harvested by domestic and foreign fishing in the EEZ in accordance with the measures contained in this plan without causing "local overfishing" or "economic overfishing" within the EEZ of each island area, and without causing or significantly contributing to "growth overfishing", or (worse) recruitment overfishing on a stock-wide basis. (See Appendix A.1 for definitions of the different types of overfishing). Thus, OY is the maximum sustainable yield (MSY) as modified by relevant socioeconomic factors, ecological considerations, and fishery biological constraints to provide the greatest long-term benefit to the Nation.

Dealing with growth and recruitment overfishing must involve regional/international arrangements for data base management, stock assessment, and development of stock-wide regulations. The best scientific information available at this time is most supportive of the concept of Pacific-wide stocks with the exception of apparent North and South Pacific stocks of striped marlin. With the acquisition of more biological knowledge in the management unit species, particularly on mahimahi, wahoo, swordfish, and oceanic sharks, the existence of more localized stocks may be shown. Thus, the definition of OY may need to be amended in the future. Managing for the OY for multi-species pelagic fisheries may require that individual management unit species stocks be harvested substantially above or below the level necessary to obtain the Maximum Sustainable Yield (MSY), particularly when taking ecosystem relationships into consideration.

6.1.4 Objectives of the FMP

Amending the FMP to include a definition of recruitment overfishing could divert attention from the goal of achieving the OY from the fisheries for the management unit species unless the objectives of the FMP and the definition of OY are amended.

6.1.4.1 Original Objectives of the FMP

1. To promote the growth of domestic harvests of the management unit species and domestic fishery values associated with these species.
2. To enhance the opportunity for successful recreational fishing experiences for the management unit species by fishermen.
3. To improve the opportunity for domestic commercial fishermen to engage in profitable fishing operations for pelagic species.
4. To enhance the marketability of sportfishing charter-boat services.
5. To promote domestic marketing of the management unit species in lieu of some marketing of these species in Guam and American Samoa by purse seine fishermen and foreign longline fishermen.
6. To eliminate waste of billfish and other management unit species which are taken along with tuna on foreign longline gear, and by purse seine and pole-and-line tuna vessels.
7. To diminish the risk of domestic/foreign gear conflicts in the FCZ, and to preclude the possibilities of gear conflicts in areas of concentrated domestic fishing.
8. To the extent consistent with the above objectives, to minimize interference with fishing for tuna in the U.S. FCZ, with special regard for the need to maintain deliveries of tuna to American Samoa canneries.
9. To improve the statistical base for better stock assessments and for making better decisions to conserve and manage highly migratory fish resources throughout their range in the Pacific Ocean.
10. To promote international/regional management of highly migratory species throughout their range as long as domestic fishery benefits under this plan are enhanced or maintained.

11. To conserve billfish and associated species in the FCZ to the extent possible while international agreements are being developed to conserve and manage these species throughout their range along with the tunas.

6.1.4.2 Revised Objectives of the FMP

- * 1. To manage fisheries for management unit species in the Western Pacific Region to achieve optimum yield (OY).
- * 2. To promote, within the limits of managing at OY, domestic harvest of the management unit species in the Western Pacific EEZ and domestic fishery values associated with these species, for example, by enhancing the opportunities for:
 - a. satisfying recreational fishing experience,
 - * b. continuation of traditional fishing practices for non-market personal consumption and cultural benefits,
 - c. domestic commercial fishermen, including charter boat operations, to engage in profitable fishing operations.
- * 3. To diminish gear conflicts in the EEZ, particularly in areas of concentrated domestic fishing.
4. To improve the statistical base for conducting better stock assessments and fishery evaluations thus supporting fishery management and resource conservation in the EEZ and throughout the range of the management unit species.
5. To promote the formation of a regional or international arrangement for assessing and conserving the management unit species and tunas throughout their range.
6. To preclude waste of management unit species associated with longline, purse seine, pole-and-line or other fishing operations.
- * 7. To promote, within the limits of managing at OY, domestic marketing of the management unit species in American Samoa, Guam, and Hawaii.

6.2 Impacts of Proposed Actions

The objective and measurable definitions of recruitment overfishing, the revised definition of OY, and the revised objectives of the FMP will guide the selection of conservation and management measures to promote the long-term viability of the pelagic management unit stocks. Because of the large, if not Pacific-wide, stock boundaries of most of the management unit species, the relatively small size of the harvest within the U.S. EEZ of the Western

Pacific Region (currently accounting for less than 10% of the Pacific-wide individual species catches), preventing overfishing will require regional or international management.

6.3 Location of Proposed Actions

The proposed actions will apply to the U.S. EEZ surrounding the Hawaiian islands, American Samoa, Guam, and other U.S. possessions in the Pacific.

6.4 Monitoring of Proposed Actions

The regulations of the FMP require the Council's Pelagic Plan Monitoring Team (PMT) to prepare an annual report on the status of the pelagic fisheries taking place in each of the island areas served by the Council, to evaluate the effectiveness of the FMP (and amendments) in meeting its goals and objectives (revised), and make recommendations for future management and administrative action.

The PMT has identified several quantifiable "indicators" for assessing the health of pelagic fish stocks and the domestic fisheries which depend on them. They have chosen initially four indicators, as described below, on which to concentrate. To this short list will now be added the SPR indicator.

- (a) Time trend in the catch per unit of effort (CPUE) for individual species for the local (domestic) fisheries

CPUE data (by species) that are comparable over time will be plotted for each island area and gear type (longline, handline, and troll) for as long a time series as available. Data to derive local CPUE are presently available for all areas although the sample size, timeliness, and reliability of the data varies from area to area.

- (b) Time trend in local CPUE compared to stock-wide CPUE

The underlying idea behind this indicator is to test if the local index of stock abundance is similar to that of the entire stock. If it is found that the two indexes are similar, the local index may thus effectively measure the health of the overall stock. If the two trend lines are dissimilar, this may indicate local overfishing or may indicate that there are actually several stocks.

The Japanese longline fishery is the most important and best source of data for deriving stockwide CPUE for billfish species. Japanese longline data have not been made available by the Japan Fisheries Agency since 1980; thus only comparisons of historical CPUE are possible until more current data can be obtained from Japan. Because of this constraint, the PMT will attempt to get more recent catch and effort data on the distant-water longline fisheries from the South Pacific Commission. Available Taiwanese and Korean longline data for recent years will also be examined for its comparability with Japanese longline data. The stock-wide CPUE trend line will be first compared to CPUE derivations from the Hawaii longline fishery and from CPUE derived from the foreign longline fisheries based in American Samoa and Guam, to the

extent of data availability. CPUE trend lines for the local troll and handline fisheries will also be compared to the stock-wide CPUE line. Indicators based on time series of catch rates may provide useful measures of resource abundance and the status of the stocks throughout their range.

(c) Time trend in size class-frequency of individual species

The PMT is also developing a time series of size statistics of catches of the management unit species to be used in conjunction with CPUE data. Size frequency distributions for time series data that are comparable over time will be plotted for each management unit species for different gear types (longline, troll, handline). The NMFS Honolulu Laboratory has established a microcomputer data base consisting of size data for several pelagic species. The purpose of the data base is to facilitate population dynamics research using size-based methods and to investigate the dynamics of spawning stock biomass (as it relates to reproductive potential).

(d) This indicator is designed for monitoring for signs of economic overfishing which is generally believed to occur much sooner than recruitment overfishing. As such, this indicator may serve as an early indication of the potential for recruitment overfishing in the future if management actions are not taken.

This indicator is designed for monitoring for signs of economic overfishing which would generally occur before fishing beyond optimal levels (OY) and much sooner than recruitment overfishing.

Since the best scientific evidence is most supportive of Pacific-wide or North and South Pacific stocks of the management unit species, access to foreign statistics and information will be required for monitoring and preventing recruitment overfishing. This would be most easily effected through formation of some regional/international arrangement and U.S. participation in such an arrangement. Such an arrangement does not exist at present. In spite of this situation, the PMT intends to continue fine-tuning quantifiable indicators and to evaluate the utility of using various estimators of the spawning potential ratio (SPR) calculated from such data as indicators of the stock condition (relative to recruitment overfishing) until more reliable estimates are available.

6.5 Management Measures for Rebuilding Stocks

If the annual reviews prepared by the PMT indicate that stocks have declined beyond the recruitment overfishing threshold, the Council will then review the PMT's analysis and determine which specific measures should be implemented to ensure rebuilding the stocks. Some possible management measures for rebuilding stocks are listed below:

1. No domestic take of the species or species complex that is recruitment overfished will be allowed except in accordance with a domestic management plan or an international/regional plan for rebuilding the stocks to above the threshold level.

2. No importation of pelagic management unit species from foreign nations not participating in international/regional conservation procedures or not having compatible domestic management plans for rebuilding the stocks to above the threshold level.
3. Establish minimum size regulation corresponding to size/age at sexual maturity if it can be shown that harvesting fish in the EEZ below this size would have a significant impact on the spawning stock biomass. This would involve determining partial recruitment and how the fishery in the U.S. EEZ affects recruitment. Those U.S. fisheries that harvest exclusively or predominantly sexually immature fish, e.g. striped marlin in Hawaii and mahimahi, wahoo, and most blue marlin in Guam, would complicate the assessment. The usefulness or worthiness of this measure is dependent on a demonstration that undersized fish can recover from the trauma of catch and release, that the fishery can be size selective in catch, and that a minimum size regulation can be effectively enforced.
4. For stocks that might eventually be determined to be mostly encompassed by the U.S. EEZ, a fishery rebuilding plan would be developed by the Council in collaboration with the fishing industry and the NMFS. The rebuilding plan would reduce fishing mortality so that the stock will recover in a finite and reasonable length of time to a level capable of supporting the OY. Developing means of effecting a reduction of fishing effort (e.g. catch restrictions or limited entry) will involve the fishing industry.
5. For stocks not encompassed by the U.S. EEZ but on which fisheries occurring in the U.S. EEZ have caused or is significantly contributing to overfishing, a fishery plan will be developed in concern with region/international efforts to rebuild such stocks. The Council will work closely with the NMFS to facilitate the formation of such regional/international organization as well as with analyses and deliberations required to effect such a regional/international rebuilding plan. In the event that no such regional/international rebuilding plan can be formulated, the Council will proceed to develop its own plan and regulations as if it were part of a regional/international plan. That is, regulations would be developed that might reasonably be expected if the U.S. were a member of a regional/international organization and fishing in the EEZ caused or significantly contributed to recruitment overfishing. Foreign nations not actively and forthrightly participating in the formation and management deliberations of such a regional/international management organization would be excluded from targeting on or incidentally taking management unit species in the EEZ of the Western Pacific Region.
6. For stocks not encompassed by the U.S. EEZ and upon which the fisheries occurring in the U.S. EEZ have not caused or significantly contributed to overfishing, the Council will be supportive of the PMT and NMFS in evaluating the fisheries, assessing the resources and participating in the scientific aspects of regional/international management of the resources.

7.0 REJECTED ALTERNATIVES

7.1 No Action

This alternative maintains the status quo and does not meet the needs of the Secretary's revised guidelines.

7.2 Spawning Potential Ratios of 0.10, 0.20, and 0.40 for Billfishes, Mahimahi, and Wahoo

The proposed action (0.20 SPR) was selected because the Council believes that it provide adequate protection of the management unit species. Goodyear (1989) indicates that 0.30 SPR is a reasonable first choice level for defining overfishing while 0.20 SPR should be a minimum value, based on generalized stock assessment considerations. A select panel of scientists recently reviewed the status of swordfish in the Atlantic and concluded that while swordfish SPR in the Atlantic is estimated to be currently just below 0.10, there is no evidence of spawning failure (South Atlantic Regional Fishery Managgemet Council 1990). In fact, estimated recruitment has increased substantially under the increased fishing pressure. Because there is considerable doubt whether recruitment could increase as much as has been estimated as well as some uncertainty regarding other estimates of population parameters, the Council believe that selecting a SPR as low as 0.10 at this time would not be prudent.

Alternate spawning stock biomass SPRs equalling 0.30 and 0.40 were considered but rejected. Given the high reproductive capacity of these pelagic resources and the resiliency of similar resources (tuna) to fishing pressure through density-dependent responses (as well as the apparent resiliency of swordfish stocks in the Atlantic and Mediterranean), the Council concludes that a SPR at 0.30 or 0.40 is unnecessarily conservative. This conclusion is also supported by the expert panels review of the Atlantic swordfish stock that a minimum SPR value of 0.30 may be conservative for such highly fecund fishes as the management unit species.

7.3 Spawning Potential Ratios for Oceanic Sharks

The proposed action (0.35 SPR level) was selected by the Council for oceanic sharks for a variety of reasons.

Goodyear (1989) concluded, without any particular resource n mind, that a reasonable first choice for a SPR value would be 0.30. The Council concludes that it would be more judicious to select a level of 0.35 SPR for oceanic sharks. Based primarily on studies on coastal shark species or stocks, sharks have been shown to have low reproductive capacity and to exhibit lower resiliency to exploitation compared to bony fishes. Thus, a higher SPR than 0.30 and thus more conservative (from the point of view of the resource) would seem to be appropriate, but the literature is of no help in suggesting how high a SPR level should be set. However, the Council notes that pelagic sharks have been taken incidentally in sizable tuna fishing operations for decades with no indication of recruitment failure. Thus, oceanic, pelagic shark stocks may be more resilient to exploitation than their coastal relatives. The Council concludes that a 0.35 SPR is a reasonable

first choice as the level at which overfishing can be defined for oceanic sharks until more appropriate information becomes available.

The Council considered but rejected two other alternative approaches for defining overfishing for pelagic sharks:

- A pelagic shark stock or stock complex is overfished when fishing mortality exceeds F_{MSY} and the exploitable stock is reduced to below that which is capable of producing MSY. While managing a resource at or near MSY to obtain OY may be an appropriate objective, managing at this level to prevent (recruitment) overfishing is contrary to the definition of overfishing in the National Standards. Unless it can be shown that shark stocks are extremely sensitive to exploitation, the Council concludes that there is no justification for selecting such a conservative definition of overfishing for oceanic sharks.
- A pelagic shark stock or stock complex is overfished when biomass is less than that which would result from a fishing mortality of $F_{0.1}$ (i.e. the level of fishing mortality at which an increase in effort produces 10% of the increase in Y/R that would occur in a lightly fished fishery for a comparable increase in effort). Since this is regarded as a conservative strategy for obtaining MSY (i.e. more conservative than managing at F_{MSY}), the Council finds that it is an inappropriate strategy for preventing overfishing and contrary to the definition contained in National Standard 1.

8.0 RELATIONSHIP OF AMENDMENT 1 TO OTHER APPLICABLE LAWS AND POLICIES

8.1 Coastal Zone Consistency

Section 307(c)(1) of the federal Coastal Zone Management Act (CZMA) requires that all federal activities which directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. The State of Hawaii CZM policies directly relating to the actions proposed in this amendment are contained in the coastal ecosystems and economic use resources categories of the Hawaii CZM statute (Act 188, Chapter 205A, HRS). Those policies are to: 1) improve the technical basis for natural resource management, 2) preserve valuable coastal (offshore) ecosystems of significant biological importance, and 3) minimize adverse environmental effects from economic uses of coastal zone resources. The actions of this amendment are fully consistent with these objectives. The Council has also reviewed the CZM programs of American Samoa and Guam, and found the actions of this amendment to be consistent with policies set forth on fisheries and living marine resources. The Council has requested reviews of this amendment from agencies responsible for CZM policy within each state and territory government.

8.2 Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA)

A Biological Opinion (September 17, 1985) rendered by the National Marine Fisheries Service as a result of Section 7 Consultation determined that the management measures contained in the FMP were not likely to jeopardize the continued existence of any of the listed marine mammals or endangered species within the EEZ. However, the opinion specified conditions under which consultation must be re-initiated.

No regulatory action is proposed in this amendment. The amendment will not affect or generate new risks to marine mammals or endangered species and their critical habitat in the activity area.

8.3 National Environmental Policy Act - Environmental Assessment

A. Purpose and Need for Action

This Environmental Assessment has been prepared in compliance with provisions of the National Environmental Policy Act which requires an assessment on the potential for significant impacts to the marine and human environments resulting from Amendment 1 to the FMP for the Pelagic Fisheries of the Western Pacific Region. In the Council's view, the proposed actions are consistent with the goals and objectives of the FMP, National Standards of the MFCMA, and the revised guidelines for the national standards (50 CFR Part 602).

B. Analysis of Impacts of the Preferred Alternative

- 1) The proposed actions will not directly affect fishing for or the condition of any stock, but application of the definitions should promote the long-term productive capacity of the pelagic management unit species. The major thrust of these actions is to provide a point of reference, i.e., overfishing definition, by which the Council intends to monitor and evaluate the condition of the managed stock or stock complex and to prevent overfishing by taking action before the stock is deemed to be overfished. Although it is the management measures that ultimately protect the stock from being overfished, the proposed actions provide the formal framework by which the Council may be able to ensure the long-term maintenance of the spawning stock and prevent the occurrence of overfishing.
- 2) The proposed actions will not affect ocean and coastal habitats. Foreign and domestic fishing operations for pelagic management unit species are subjected to stringent terms and conditions including, but not limited to, gear and area restrictions, reporting and observer requirements, etc. (see Section 3.0)
- 3) The proposed actions will not have any impact on public health or safety. The proposed actions are viewed as a means of helping to maintain these high standards.
- 4) The proposed actions will not impact marine mammals, endangered or threatened species, marine mammals, or critical habitats (see Section 8.2).
- 5) The proposed actions will not result in cumulative adverse effects that could substantially impact pelagic management unit species or any related stocks.
- 6) The proposed actions are not expected to generate controversy. It is acknowledged, however, that there are uncertainties in the establishment of specific SPR levels to depict a condition at which overfishing is deemed to be taking place. The methods used to measure SPR and especially the application of SPR may be challenged; nevertheless, it is the intent of the Council to exercise the best informed judgement in implementing the proposed actions which are consistent with the revised national standard guidelines (50 CFR Part 602) of the MFCMA. The proposed actions in and of themselves should not result in socio-economic impacts.
- 7) The proposed actions will not have any effect upon flood plain and wetlands, or trails and rivers listed, or eligible for listing, on the National Trails and Nationwide Inventory of Rivers.

C. Agencies and Persons Consulted

The Coastal Zone Management offices and Natural Resources offices of American Samoa, Guam, and Hawaii were sent a draft of this FMP

amendment for review, as were the U.S. Coast Guard and U.S. Fish and Wildlife Service, commercial fishermen and fishing industry.

D. Finding of No Significant Impact

Based on the information contained in the Environmental Assessment and the FMP, it is concluded that the actions proposed in FMP Amendment 1 will not have any significant impact upon the marine or human environment. An Environmental Impact Statement, therefore, is not required.

8.4 Executive Order 12291 and Regulatory Flexibility Act

Amending the FMP to include overfishing definitions, revised FMP objectives and OY does not in itself result in socio-economic impacts. It is at that point when overfishing is occurring or likely to occur and specific management action to rebuild the stock is proposed that socio-economic impacts must be assessed. Until a particular stock in danger of being overfished has been identified and specific management measure elected, it is not possible to assess the potential socio-economic impact of the resulting action. This FMP amendment identifies possible measures for rebuilding the stock but proposes no specific management measure, no review of existing measures or development of legislative proposals on regulations. A regulatory impact review and flexibility analysis will be performed when a specific management action is proposed by the Council.

8.5 Paperwork Reduction Act

No rule imposing record-keeping, reporting requirement, or any form of information collection burden is proposed under this amendment.

8.6 Indigenous Peoples' Fishing Rights

This FMP amendment does not affect the cultural or religious practices of native Hawaiians, Samoans, or Chamorros.

8.7 Executive Order 12630 (Government Actions and Interference with Constitutionally Protected Property Rights)

FMP Amendment 1 does not propose any administrative, regulatory, legislative policy or action that affects, or may affect, the use of any real or personal property.

8.8 Executive Order 12612 (Federalism Assessment)

This amendment does not propose any regulation, legislative comment, legislation, or any policy statement or action that have substantial direct effect on the State of Hawaii and Territories of American Samoa and Guam. It does not, therefore, warrant the preparation of a federalism assessment under Executive Order 12612.

9.0 LITERATURE CITED

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- Stroud, R.H. 1989. Planning the Future of Billfishes: Research and Management in the 90's and Beyond. Proceedings of the Second International Billfish Symposium, Kailua-Kona, Hawaii. August 1-5, 1988. Part 1: Fishery and Stock Synopses, Data Needs and Management. National Coalition for Marine Conservation, Inc. Savannah, GA. 361 p.
- South Atlantic Regional Fishery Management Council. 1990. File materials.

APPENDIX A.1 TYPES OF OVERFISHING

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Fishing results in
the Max \$ profits

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COMMERCIAL EXTINCTION

Fishermen are being
wiped out

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RECRUITMENT OVERFISHING

Fish are being
wiped out

GROWTH OVERFISHING

MSY

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Biomass or
Stock -- the total
amount of fish in
the Ocean at any
point in time

NO FISHING EVER
-- VIRGIN STOCK

Fish are
being removed
at the same
rate that they
are "growing
into" the
stock--max.
harvest lbs.

Fish are being removed
faster than they are
"growing into" the
stock

Fishing level
which begins
to damage the
ability of the
stock to sustain
its reproduction

NO FISH LEFT
-- EXTINCTION

Appendix A.2

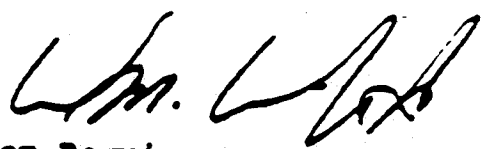
**Correspondence Between the Council and the
National Marine Fisheries Service
Regarding an Exemption from the Need to Develop a
Definition of Recruitment Overfishing**



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

APR 6 1980

MEMORANDUM FOR: F/SWR - E.C. Fullerton

FROM: F - William W. Fox, Jr. 

SUBJECT: Request for Exemption from Requirement to
Prepare a Definition of Overfishing for Western
Pacific Pelagics FMP

Your request for exemption from the requirement to prepare an overfishing definition for the Western Pacific Pelagics FMP is denied for the following reasons:

1. The problems cited in the request are not unique to Western Pacific pelagics; the same arguments could be made for Atlantic billfishes, swordfish, sharks, tunas and coastal migratory pelagics. The Southeast Region and Councils are faced with a similar situation, yet have prepared draft overfishing definitions for swordfish, sharks, king and Spanish mackerel, and cobia, and are planning to develop definitions for billfish. Highly migratory Atlantic bluefin tuna stocks are assessed and quotas set on best available data. The fact that these species migrate over large areas (including areas beyond U.S. jurisdiction), and the Councils cannot control fishing mortality throughout the full ranges of the stocks, does not diminish the need for overfishing definitions; without points of reference, efforts to manage such interjurisdictional stocks will be hampered. Approval of this exemption would only serve to excuse efforts by other Councils to develop definitions for similar species elsewhere.

2. The guidelines acknowledge that data are often incomplete and that stock status may not be well known; the Council can deal with this by using best available data and by analogy to other similar species and fisheries where better data exist. This is being done for many of the reef fish species, where little or no specific information is available.



3. To grant this exemption establishes a precedent that is counter to the conservation intent of the guidelines. A similar request for the Gulf of Mexico and South Atlantic Corals FMP was denied and the Councils are preparing overfishing definitions for that FMP.

4. Overfishing definitions are not intended to be permanent; they are expected to be revised as better data are sought, collected and analyzed. An approvable definition, no matter how tenuous, should encourage better data collection and stock assessments.

5. Although the Council claims to be unable to define overfishing, the request for exemption repeatedly refers to the stocks not being overfished. If the Council has concluded that the stocks are not overfished, it is presumably using some definition to draw this conclusion.

I am aware that this FMP may present special challenges for development of overfishing definitions; the 602 guidelines were deliberately constructed to allow for a variety of circumstances and provide for the use of best available data and best judgment in dealing with such fisheries. I strongly encourage the Council and your staff to continue to work closely with the Southwest Center and other Regions to develop acceptable definitions and to identify and address data deficiencies.

Attachments



WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL

January 25, 1990

Mr. E. Charles Fullerton
Regional Director
Southwest Region, NOAA/NMFS
300 South Ferry Street
Terminal Island, California 90731

Dear Charles:

This is to submit the Western Pacific Fishery Management Council's request for an exemption from the need to develop a definition of overfishing for the Pelagics Fishery Management Plan (FMP).

The FMP was developed over a period of years and finally implemented in 1987. The FMP covers fisheries for billfish, mahimahi, wahoo and oceanic sharks. The basic rationale for the FMP is the need to control fishing to achieve optimum yield (OY) from the fisheries. This is consistent with the mandate of the Magnuson Act to consider economic and social factors as well as biological and ecological conditions in determining the fishing patterns that will produce maximum benefit to the nation. That is, the Magnuson Act clearly recognizes that FMPs are needed to manage fisheries, not to manage fish stocks. It is through management of fishing that a FMP achieves the goals of the Magnuson Act, including optimal harvest levels and patterns and protection of the stocks from overfishing. The Pelagics FMP controls on fishing in the EEZ are primarily intended to prevent user conflicts and protect domestic interests in pelagic species when they are in the EEZ. It is acknowledged that these controls are not likely to be able to prevent overfishing (in a biological sense) because "only a small portion of total fishing mortality of these species throughout their range is the result of fishing pressure on these species in the (EEZ)" (Sec. 3.3, p. 3-7). Notwithstanding, the FMP was approved recognizing the desirability of having a management regime in place for economic and social reasons.

There is nothing new in the data base suggesting that management of pelagic species fisheries in the EEZ has the capability of preventing overfishing of the stocks throughout their range. The fisheries in the EEZ at the present time are of such relatively small magnitude that they cannot make a significant contribution to overfishing, and by the same token, control of fishing in the EEZ cannot make a significant

contribution to rebuilding of stocks if overfishing were to occur on any of the stocks throughout its range. As a result, the Council's Pelagics Plan Monitoring Team (PMT) has indicated it is unable to develop a "measurable and objective" definition of overfishing for any of the management unit species within the EEZ.

The Council, its SSC and PMT have long pointed out the many data gaps that hamper development of sound stock assessments for management unit species. We look forward to implementation of the regulatory amendment of the FMP regulations to reinforce State of Hawaii landing report requirements so we can get better data on management unit species catches in domestic fisheries (longline, trolling, handline, etc.). Also, we hope the Honolulu Laboratory will continue working on the backlog of foreign longline and domestic fishery data to identify the nature and possible magnitude of fishery interactions, and especially the extent to which domestic catches may have been affected by the absence of foreign longline fishing since 1979. Further, the Council will continue to conduct its annual review of the fishery and we intend the annual report to meet the requirements for the periodic Stock Assessment and Fishery Evaluation (SAFE) report called for in the revised Secretarial Guidelines.

Meanwhile, the PMT is beginning the development of possible indicators of stock status that could be used in the EEZ and on a Pacific-wide basis and the identification of specific data requirements to make these indicators usable. The PMT is computing and analyzing catch rates to see if they could serve as stock density indicators either in the EEZ or beyond. The PMT also is developing a time series of size at harvest which could be reflective of resource conditions over time. This could conceivably lead to development of a usable definition of overfishing for one or more stocks in the future. Obviously, use of such indicators will be dependent on the availability of a continuing flow of data on EEZ and Pacific-wide fisheries.

Nonetheless, an objective and measurable definition of overfishing in the EEZ for these wide-ranging species cannot now be developed. The Council asks that the NMFS agree and exempt us from the need to develop an FMP amendment under these circumstances.

Sincerely,



Kitty M. Simonds
Executive Director

KMS/eik

(kexempt/mfs1)



**WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL**

**Request for Concurrence on an Exception for
Establishing an Objective and Measurable Definition of Overfishing
for the Migratory Species covered under the Fishery Management Plan
for the Pelagic Fisheries of the Western Pacific Region**

Definitions of Overfishing

The revised guidelines for National Standards 1 and 2 of the Magnuson Act emphasize conservation of the fishery resources and require each regional fishery management council to establish, to the extent possible, an objective and measurable definition of overfishing for all species or species group in each fishery management plan (FMP). However, if a council can demonstrate that an existing FMP is already consistent with the revised guidelines, then the council may request concurrence from the National Marine Fisheries Service (NMFS) on an exemption from amending the FMP. Overfishing is described in the revised guidelines as "a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock-complex to produce Maximum Sustainable Yield (MSY) on a continuing basis...", and overfishing must relate to the reproductive potential of the stock.

Overfishing is defined broadly in the Fishery Management Plan for the Pelagics Fisheries of the Western Pacific Region (Pelagics FMP) to include growth overfishing ("a level of effort in excess of the level needed to obtain the MSY") as well as recruitment overfishing ("fishing which has reduced a stock to such a level that its reproductive potential is reduced").

Findings

The Pelagics FMP states "...that the level of fishing which has occurred and is likely to occur in the FCZ cannot appreciably affect the overall condition of the management unit stocks and will not pose a threat of biological overfishing." This finding is still true today.

After a review of the revised guidelines and the Pelagics FMP, the Western Pacific Regional Fishery Management Council (Council) concludes that the Pelagics FMP does not contain an objective and measurable definition of overfishing for any of the pelagic management unit species (PMUS) covered by the plan. However, after also reviewing the nature of each of the PMUS, the past and present fisheries on them, the poor coverage and

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January 26, 1990

quality of available fishery statistics, and the lack of adequate information on the life history of the animals, the Council concludes that the requirements for defining overfishing thresholds solely in the U.S. EEZ, including regulations to prevent overfishing, are not appropriate and should not and cannot now be applied to the PMUS. Therefore, the Council requests concurrence from the NMFS on an exception from applying the revised overfishing guidelines to the Pelagics FMP.

Population Structure and Boundaries of the PMUS

A basic element in management is determining the biological status of fish exposed to a fishery and a regulatory regime. Distribution boundaries must be set in order for the status of stocks to be assessed. If these boundaries do not completely enclose a stock, then events external to the management area can significantly affect the stock.

The best available information on the stock structure of billfishes indicates that there are Pacific-wide stocks in the case of swordfish and blue and black marlin, separate North and South Pacific stocks of striped marlin, common mahimahi and shortbill spearfish, and probably continental margin stocks of sailfish. Little information is available on the stock structure of wahoo, pompano mahimahi, and the oceanic sharks covered by the Pelagics FMP. In the absence of such information, a working hypothesis is that these stocks might also occupy a broad range extending well beyond the U.S. EEZ of the western Pacific region. Thus, meaningful definitions of overfishing developed for the PMUS need to be applied throughout the range of the PMUS stocks in the Pacific and it would be meaningless to establish a numerical definition of overfishing to be applied solely within the U.S. EEZ.

Population Modeling and Status of the Stocks

Population modeling has been attempted only for billfish. The only type of billfish population modeling which has been performed to date consists of fitting a generalized production model to longline fishery data to estimate the status of the fishery resources with respect to MSY. At the recent Second International Billfish Symposium, U.S. and Japanese scientists working independently with similar data reached the following conclusions:

- 1) The Pacific-wide stock of blue marlin is moderately growth overfished, but less so than similar assessments indicated 10 years ago (model fits the data well).
- 2) The status of black marlin on a Pacific-wide basis could not be determined because of misreporting, under-reporting, or other data quality problems (poor fit of the model).
- 3) The striped marlin stocks (assessed as either a single Pacific-wide stock or separate North and South Pacific stocks) are probably underfished, but the North Pacific model is suspect due to the lack of data on the large-mesh drift gill net fishery.

- 4) The Pacific-wide swordfish stock may be about at the point of MSY, but most scientists declined to draw conclusions because the stock is probably not in equilibrium due to major changes occurring in the fishery.
- 5) The sailfish and shortbill spearfish species complex is probably underfished or, at most, at the point of MSY, but data problems made modeling difficult.

Because of the generally poor quality of the available billfish fishery statistics and the lack of information on the biology of the animals, no attempts have been made at more sophisticated population modeling, e.g., age- or size-based stock assessment. Since such models should be used to investigate the dynamics of spawning stock biomass (as it relates to reproductive potential), the existing models for billfish would provide little basis for defining overfishing under the new guidelines.

No stock assessment information is available on the status of wahoo, oceanic sharks, and the two species of mahimahi. In fact, the scanty information presently available is not even sufficient for postulating possible stock structures for these species, but there are no indications that these species are overfished on either a Pacific-wide or a localized basis. On the other hand, the existence of established, fairly large-scale fisheries for the common mahimahi off Japan, Taiwan, and Ecuador, as well as numerous small-scale fisheries for mahimahi throughout the Pacific Basin suggests that the resource is certainly not in a virgin state. Also, incidental catches of mahimahi occur in the well-developed tuna purse seine fishery in the central and western Pacific as well as in the large-mesh drift gillnet fisheries in the North and South Pacific.

Inappropriateness of Attempting to Prevent Overfishing of PMUS Solely within the U.S. EEZ

The reported harvest by domestic fleets in the U.S. EEZ probably ranges from 1% to 5% of the total Pacific harvest of any one of the PMUS. Given this situation and the apparently large, if not Pacific-wide, extent of the stocks, the Council concludes that the level of fishing which has occurred, and is likely to occur, in the U.S. EEZ will probably not appreciably affect the status of the stocks (i.e., will probably not contribute significantly to overfishing as defined under the revised guidelines). Similarly, regulatory action controlling domestic harvests in the U.S. EEZ will not likely prevent growth overfishing or recruitment overfishing. Likewise, the Council concludes that if any of the stocks were to become overfished (on a Pacific-wide basis), restricting the harvest of the domestic fishery would be an ineffectual remedy based on our current knowledge of the resource stock structure and the size of the domestic fishery. Not only would harvest restrictions on domestic fishermen not contribute in any significant way to preventing overfishing, they might instead, if not well conceived, cause economic and social disruptions among the domestic industry and exacerbate fishery interaction problems. To manage the resources for biological

purposes, regulations would need to be promulgated throughout the range of the stocks through international cooperation. We must emphasize that a mechanism for comprehensive data collection and analysis is needed to provide a basis for evaluating the impacts of any harvesting regulations for fisheries which take the PMUS. This applies both within and outside the U.S. EEZ.

The Council finds it to be impossible to develop meaningful and measurable definitions of overfishing that could, at this time, be translated into effective domestic regulations to prevent overfishing. Therefore, the Council requests concurrence from the NMFS on an exception from applying the revised guidelines to the Pelagics FMP. This request is based on the biological nature of the PMUS, the size of the domestic pelagics fisheries relative to the total Pacific fisheries, the unavailability of current fishery data, the paucity of biological information, and the resultant elementary state of stock assessment modeling for these resources.

While the Council concludes that the revised guidelines cannot be applied to the PMUS in the U.S. EEZ for the above reasons, the conservation of PMUS resources on a Pacific-wide basis is still a relevant and important issue. An ability to achieve protection of the reproductive potential of Pacific stocks of PMUS using regulations applied unilaterally by the U.S.A. within the U.S. EEZ does not preclude managing the fisheries taking those resources within our EEZ. Yield to the domestic fishery may still be optimized, fishery gear interactions can be mitigated, and opportunities to fish for the PMUS in certain areas of the U.S. EEZ can be limited if need be. Managing the fishing fleets taking pelagic species was the primary motivation for originally developing the Pelagics FMP. Today, the Council is still committed to managing the fisheries for the PMUS and is cognizant of ongoing (and unfolding) allocation issues. The Council again wishes to emphasize the importance of improving data collection both on the pelagic fisheries in the U.S. EEZ and on fisheries in other areas to establish the structure and condition of stocks and to provide the information needed for effective management.

Resource Monitoring and Plans for Stock Dynamics Research

Resource monitoring and stock dynamics research are needed and could involve collaboration among the Council's Pelagics Plan Team (PT), the Southwest Fisheries Center Honolulu Laboratory, and possibly foreign governments and international agencies. Work in this area might include gaining access to more current fishery data, modeling the stock dynamics of species of major importance (e.g., blue and striped marlin, swordfish and mahimahi), and evaluating alternative indicators that could be monitored in our EEZ or elsewhere to determine whether overfishing is occurring on a Pacific-wide basis. Once the data are obtained and analyzed, significant progress in stock assessment, defining overfishing, and development of procedures for monitoring stock levels might be expected within a year, and more definitive results within two years.

The Council's Pelagics PT is now developing quantitative indicators to monitor and assess the status of the stocks of the PMUS in the U.S. EEZ. The PT is computing and analyzing catch rates (stock density indicators) for each of the PMUS from historical records. Indicators based on the time series of catch rates should provide a useful measure of resource abundance of these migratory stocks while in the U.S. EEZ and may be useful as measures of the status of the stocks throughout their range. Likewise, the PT is developing a time series of size statistics of catches of PMUS to be used in developing other quantitative indicators of resource condition.

The regulations of the Pelagics FMP mandate the Council, in cooperation with the NMFS and state and territorial agencies, to conduct a full review of the Pelagics FMP before March 23, 1992 (five years from the effective date of the Pelagics FMP). The review will evaluate the effectiveness of the Pelagics FMP in meeting the Council's objectives, as well as the need for changes in the management measures (including data requirements). The five-year review will necessitate re-examining the applicability and relevancy of the revised guidelines for meeting the goals and objectives of the Pelagics FMP, including the prevention of overfishing. During the interim, the Council's PT will be applying quantitative indicators for monitoring the status of the stocks to better meet requirements of the SAFE document and annual reports. In addition, the collaborative research mentioned above should result in improved data availability and resource stock assessment modeling. In the meantime, the Council requests concurrence from the NMFS for an exemption from amending the FMP to establish a measurable definition of overfishing for the migratory species covered under the Pelagics FMP.

